**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Environmental and Social Impact Assessment*

Submitted to:

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# Acronyms and Abbreviations

| | |
|---|---|
| The Project | 105.3 km Kınalı- Malkara Motorway Project |
| ÇOK A.Ş. | Çanakkale Otoyol ve Köprü İnşaat Yatırım ve İşletme A.Ş. |
| WSP Türkiye | WSP Danışmanlık ve Mühendislik Ltd. Şti. |
| Kınalı-Balıkesir Motorway | 324 km long Kınalı – Tekirdağ – Çanakkale – Savaştepe Motorway |
| AoI | Area of Influence |
| BOT | Build-operate-transfer |
| BTEX | Benzene, Toluene, Ethylbenzene, Xylenes |
| CCRA | Climate Change Risk Assessment |
| CH | Critical Habitats |
| CIA | Cumulative Impact Assessment |
| CLO | Community Liaison Officer |
| CLS | Community Level Survey |
| CNG | Compressed Natural Gas |
| CR | Critically Endangered |
| DD | Data Deficient |
| DEM | Digital Elevation Model |
| DHMİ | General Directorate of State Airports Authority (Devlet Hava Meydanları İşletmesi in Turkish) |
| E&S | Environmental and Social |
| EAAA | Ecologically Appropriate Area of Analysis |
| EC | European Communities |
| EEA | European Environment Agency |
| EHS | Environmental Health and Safety |
| EIA | Environmental Impact Assessment |
| EN | Endangered |
| EOO | Extent of Occurrence |
| EP | Equator Principles |
| EPC | Engineering, Procurement, and Construction |
| EPFI | Equator Principles Financial Institutions |
| ESAP | Environmental and Social Action Plan |
| ESIA | Environmental and Social Impact Assessment |
| ESMP | Environmental and Social Management Plan |
| ESMS | Environmental and Social Management System |
| EU | European Union |
| EUNIS | European University Information Systems Organisation |
| FP | Fauna Sampling Point |
| FW | Freshwater Sampling Point |
| GBVH | Gender-Based Violence and Harassment |
| GDWM | General Directorate of Water Management |
| GM | Grievance Mechanism |
| GTL | Global Terminal Limited |
| IBA | Important Bird Area |

| | |
|---|---|
| ICOMOS | International Council on Monuments and Sites |
| IFC | International Finance Corporation |
| IFI | International Financing Institutions |
| ILO | International Labour Organization |
| IPA | Important Plant Area |
| IUCN | International Union for Conservation of Nature |
| KBA | Key Biodiversity Area |
| KGM | General Directorate of Highways |
| Km | Kilometre |
| LC | Least Concern |
| LNG | Liquefied Natural Gas |
| LPG | Liquefied Petroleum Gas |
| LSA | Local Study Areas |
| MoAF | Ministry of Agriculture and Forestry |
| MoC | Management of Change |
| MoEUCC | Ministry of Environment, Urbanization and Climate Change |
| MoTI | Ministry of Transport and Infrastructure |
| N/A | Not Applicable |
| NE | Not Evaluated |
| NGO | Non-Governmental Organization |
| NT | Near Threatened |
| NTS | Non-technical Summary |
| O&M | Operation and Maintenance |
| OECD | Organization for Economic Co-operation and Development |
| ORP | Oxidation-Reduction Potential |
| PDoEUCC | Provincial Directorate of Environment, Urbanization and Climate Change |
| PM | Particulate Matter |
| PS | Performance Standard |
| RAP | Resettlement Action Plan |
| RF | Resettlement Framework |
| RIV | Residual Impact Value |
| RLE | Red List of Ecosystems |
| RSA | Regional Study Area |
| RWIHC | Regulation on Water Intended for Human Consumption |
| SEP | Stakeholder Engagement Plan |
| SEPA | Special Environmental Protection Area |
| SF | Safety Factor |
| SHW | State Hydraulic Works (DSİ in Turkish) |
| SIA | Social Impact Assessment |
| SP | Flora Sampling Point |
| SPAs | Special Provincial Administrations |
| SPV | Special Purpose Vehicle |
| SRTM | Shuttle Radar Topography Mission |
| TEDAŞ | Türkiye Electricity Distribution Inc. (Türkiye Elektrik Dağıtım A.Ş.) |
| TMMOB | Union of Chambers of Turkish Engineers and Architects |
| TOX | Total Organic Halogens |

| | |
|---|---|
| TPDS | Turkish Plants Data Service (TÜBİVES in Turkish) |
| TPH | Total Petroleum Hydrocarbons |
| TREDAŞ | Trakya Electricity Distribution Sales Co. (Trakya Elektrik Dağıtım A.Ş) |
| TREPAŞ | Trakya Electricity Retail Sales Co. (Trakya Elektrik Perakende Satış A.Ş) |
| TURKSTAT | Turkish Statistical Institute (TUİK in Turkish) |
| UNCRC | The United Nations Convention on the Rights of the Child |
| UNECO | United Nations Educational, Scientific and Cultural Organization |
| VEC | Valued Environmental and Social Component |
| VOC | Volatile Organic Compounds |
| VU | Vulnerable |
| WH | World Heritage |
| WHO | World Health Organization |
| WWF | Worldwide Fund for Nature |
| WWTP | Wastewater Treatment Plant |

# 1.0 INTRODUCTION

## 1.1 Project Background and Objectives

Çanakkale Otoyol ve Köprü İnşaat Yatırım ve İşletme A.Ş. (herein after 'ÇOK A.Ş') retained WSP Danışmanlık ve Mühendislik Ltd. Şti. (Herein after "WSP Türkiye") to prepare the Environmental and Social Impact Assessment ("ESIA") for the 105.3 km Kınalı- Malkara Motorway Project (herein after 'the Project'") in compliance with the national and international requirements.

The Project will be realized with build-operate-transfer ("BOT") model. the engineering, procurement, and construction ("EPC") contractor for the main design and construction works of the Project. EPC Contractor will perform the works with several subcontractors on different sections of the Project. At this stage of the Project, for operations and maintenance of the Motorway, there are two options; ÇOK A.Ş. will appoint a contractor in due course (referred to herein as the "Operation and Maintenance ("O&M") Contractor") or ÇOK A.Ş. will operate the Project by itself.

The 105.3 km Kınalı - Malkara Motorway Project is planned to be established by the EPC contractor of the Project in compliance with the national and international requirements.

The Project is 105.3 km in length and is a part of the 324 km long Kınalı – Tekirdağ – Çanakkale – Savaştepe Motorway (herein after "Kınalı-Balıkesir Motorway"). The Project covers the sections of the Kınalı-Balıkesir Motorway starting at the Silivri Prison Interchange area of the existing O-3 İstanbul – Edirne Motorway at KM 0+000 and ending at 105+300 for a total of 105.300 km. The provinces and districts that Project will pass through between 0+000 km and 105+300 km are given in detail below.

- İstanbul Province, Silivri District (0+000 km - 17+700 km)
- Tekirdağ Province, Marmaraereğlisi District (17+700 km - 25+200 km)
- Tekirdağ Province, Çorlu District (25+200 km - 43+600 km)
- Tekirdağ Province, Süleymanpaşa District (43+600 km - 95+600 km)
- Tekirdağ Province, Malkara District (95+600 km - 105+272 km)

The ESIA Report has been prepared to comply with the requirements of the Turkish national law/regulations, the International Finance Corporation ("IFC") Performance Standards ("PSs") and Guidelines, Equator Principles 4 (2020), and applicable European Union ("EU") Directives.

In order to meet the requirements of IFIs, ÇOK A.Ş. has commissioned WSP Türkiye to undertake the ESIA study that will identify the environmental and social impacts of the Project.

### *Project History*

Based on the Turkish Government's "Vision 2023", the Turkish Ministry of Transport, General Directorate of Highways (KGM) has set national goals for strengthening of the motorway network.

As the overall promoter and initiator of the Project, KGM tendered the Project under a BOT contract model with a 16-year 2 2-month and 12-day concession period. ÇOK A.Ş. is the Turkish-based company (SPV) created by the Consortium for implementing the Project.

In November 2016, an EIA Study was completed for the entire 324,441 km long motorway in conformance with Turkish EIA regulatory requirements. On 23 November 2016, the EIA named Kınalı-Tekirdağ-Çanakkale-Savaştepe 1st and 2nd Section Motorway was approved by the Ministry of Environment Urbanization and Climate Change (MoEUCC).

As a part of Kınalı-Balıkesir Motorway Project, for Malkara-Çanakkale Motorway, including the 1915 Çanakkale Bridge, ESIA study carried out for the construction and operation phase in line with the national environmental and social legislation including international conventions and treaties and the related international standards by third party company. The ESIA report was finalized in March 2018.

The construction phase of the Malkara-Çanakkale Motorway began in March 2018 and was completed on March 18th, 2022. The motorway, including the 1915 Çanakkale Bridge, officially opened to traffic on March 19th, 2022.After completion of the Malkara-Çanakkale part of the proposed Kınalı-Balıkesir Motorway Project, in 2022, WSP Türkiye was retained to carry out ESIA study for Kınalı-Malkara Motorway Project in line with the national environmental and social legislation and international standards. The Scoping Report, previously prepared by WSP Türkiye in April 2023, has identified gaps in the existing national EIA Report and included actions that need to be undertaken in order to close these gaps and reach a full ESIA compliant with the requirement of the IFIs.

## *Project Owner and Contractor*

The Kınalı-Malkara Motorway Project owner is the Republic of Türkiye Ministry of Transport and Infrastructure (MoTI), General Directorate of Highways (KGM). ÇOK A.Ş. is the SPV created by a consortium for implementing the Project. The Project will be realized with BOT model. The design lifetime of the Project has been planned as 100 years. The concession period of the Project has not yet been determined. A part of the 100-year Project life will be operated by ÇOK A.Ş within the scope of the BOT contract. The operation period will be clarified later in consultation with the MoTI and Undersecretariat of Treasury. An operation and maintenance programme will be developed and implemented by ÇOK A.Ş. as per the BOT Contract to assure that specified conditions are met upon the hand-back of the motorway to KGM at the end of the Concession Period.

The total duration of the Project's construction phase will be 45 months. This includes eight months allocated for pre-construction activities, 34 months for the actual construction, and an additional three months for testing and commissioning works.

**Table 1: Project Parties**

| Parties | Responsible Party | Main Role & Responsibilities |
|---|---|---|
| Project Owner | General Directorate of Highways (KGM) | Assigning an “Appointed Company” for the Project under the BOT Contract<br>Carrying Expropriation and Land acquisition processes<br>Supervision of the Project<br>Approval of the design of the Project |
| Special Purpose Vehicle | ÇOK A.Ş. | Borrower of the Project finance<br>Contractor for Project execution<br>Development of Project design<br>Construction of the Project<br>Operation of the Project |
| EPC Contractor | - | Development of Project design<br>Conducting early work studies (pre-construction activities)<br>Construction of the Project |
| ESIA Consultant (Independent national and international environmental and social consulting firm) | WSP Türkiye | Development of ESIA Report and other deliverables as specified in the relevant sections of this report |

## *Environmental Permitting*

In November 2016, the EIA Study was completed for the entire 324,441 km long motorway in conformance with Turkish EIA regulatory requirements. The EIA, entitled "Kınalı-Tekirdağ-Çanakkale-Savaştepe 1st and 2nd Section Motorway EIA (2016 Turkish EIA)", was approved by the MoEUCC on 23 November 2016. The Project covers the Section of the Kınalı-Balıkesir Motorway starting at the Silivri Prison Interchange area of the existing O-3 İstanbul – Edirne Motorway at KM 0+000 and ending at 105+300 for a total of 105.300 km.

Major permits and licenses/approvals to be obtained during Project phases are given in Table 2. Commitment register will be prepared for the Project in order to effectively track all requirements stated in the ESIA and relevant documents.

**Table 2: Required Permits**

| Project Phase | Activity | Document | Status | Responsible Party |
|---|---|---|---|---|
| Pre-Construction | EIA | EIA Decisions | EIA was approved by the MoEUCC November 23rd, 2022, for Kınalı-Tekirdağ-Çanakkale-Savaştepe 1st and 2nd Section Motorway | KGM |
| Pre-Construction | Expropriation | Approval of Expropriation Plans | Not started | KGM |
| Pre-Construction and Construction | Material extraction – quarries and borrow pits | II-a Group Facility Operation Permit<br><br>EIA decisions | Initiated as of the reporting date | ÇOK A.Ş. / EPC Contractor |
| Construction | Transportation of long and heavy trucks | Special Cargo Transportation Document | Not started | ÇOK A.Ş. / EPC Contractor |
| Pre-construction and Construction | Material extraction - quarries | Environmental Permit on Emission | Not started | ÇOK A.Ş. / EPC Contractor |
| Construction | Stream deviation (if any) | Soil Erosion Prevention – Permission Letter from DSİ | Not started | ÇOK A.Ş. / EPC Contractor |
| Construction and Operation | Wastewater treatment | Environmental Permit on Wastewater | Not started | ÇOK A.Ş. / EPC Contractor for the construction phase<br><br>ÇOK A.Ş. and O&M Subcontractor for the operation phase |
| Construction | Groundwater usage (if any) | Permission to Use Groundwater from DSİ | Not started | ÇOK A.Ş. / EPC Contractor |

| Project Phase | Activity | Document | Status | Responsible Party |
|---|---|---|---|---|
| Pre-construction | All activities close to or in the drinking water basins | Permission Letter from relevant Metropolitan Municipality and DSİ | Not started | ÇOK A.Ş. / EPC Contractor |
| Pre-construction and construction | Alignment passing through flood protection facilities (if any) | Permission Letter from DSİ | Not started | ÇOK A.Ş. / EPC Contractor |
| Construction and Operation | Alignment passing through wetlands (if any) | Application Form for Activities Near Wetlands<br><br>Commitment Letter | Not started | ÇOK A.Ş. / EPC Contractor |
| Pre-construction, Construction and Operation | Waste Disposal | Waste Disposal Agreements with relevant municipalities or licensed companies | Not started | ÇOK A.Ş. / EPC Contractor for the construction phase<br><br>ÇOK A.Ş. and O&M Subcontractor for the operation phase |
| Pre-construction and Construction | Tree cutting | Forest Permit<br><br>Afforestation Plan | Not started | ÇOK A.Ş. / EPC Contractor |
| Construction and Operation | Noise generating activities | Evening and Night Work Permit | Not started | ÇOK A.Ş. / EPC Contractor for the construction phase<br><br>O&M Subcontractor for the operation phase |
| Construction | General construction activities | Hydrogeological Investigation Report | Not started yet | ÇOK A.Ş. / EPC Contractor |
| Pre-construction and Construction | Displacement of Existing Land Use, Property and People | Expropriation and Bilateral Agreements | Not started yet | ÇOK A.Ş. / EPC Contractor |
| Construction | Transport of hazardous materials | License Certificate for Waste (Hazardous) Carrying Vehicles | Not started yet | EPC Contractor |

## 1.2 Project Rationale

In accordance with Turkey's "Vision 2023," the Turkish Government is committed to strengthening its transportation infrastructure. In line with this mandate, the Turkish Ministry of Transport, General Directorate of Highways (KGM), has set national goals for the enhancement of the motorway network.

In 2015, the Marmara Motorway Ring Project was announced, marking a significant advancement in Turkey's transportation development strategy. This comprehensive initiative includes key projects such as the İstanbul-İzmir Motorway, the Northern Marmara Motorway, and the Kınalı-Tekirdağ-Çanakkale-Savaştepe Motorway. The completion of these projects is anticipated to realize the Marmara Motorway Ring, thereby enhancing transportation connectivity and efficiency across the region.

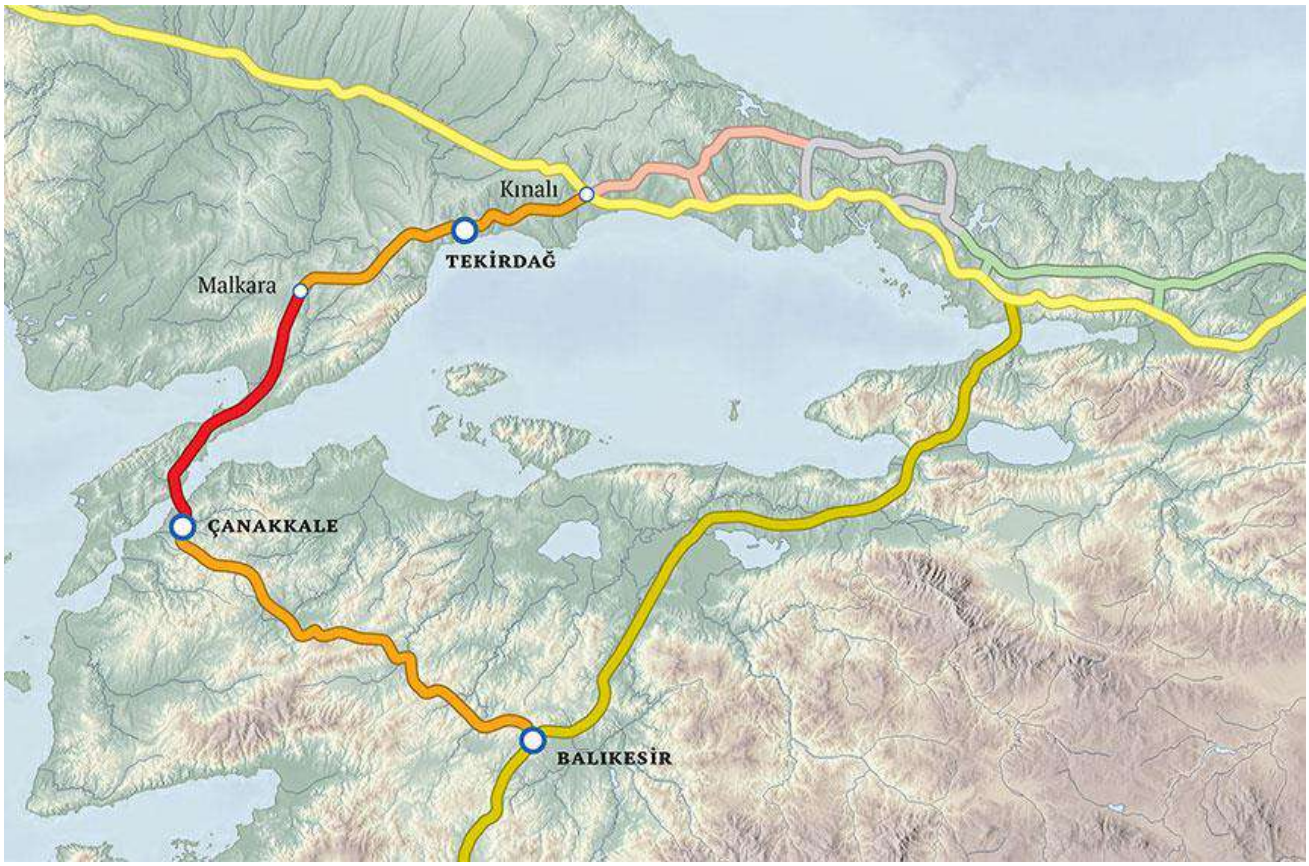



**Figure 1: Marmara Motorway Ring (https://www.1915canakkale.com/kurumsal/proje-bilgisi)**

The Kınalı-Tekirdağ-Çanakkale-Savaştepe Motorway Project, an integral component of the Marmara Motorway Ring, represents Turkey's commitment to improving its transportation infrastructure. Within this framework, the Kınalı-Malkara section is of particular importance, serving as a key element of the comprehensive initiative.

The primary objective of the Project is to optimize both long-distance and localized traffic flows, aligning with Turkey's goals to enhance connectivity from Anatolia/Asia to Europe, including routes through Greece and Bulgaria. Additionally, the Project aims to improve traffic movement along the İstanbul-İzmir industrial belt and accommodate the growing leisure and tourist traffic. It also aims to address congestion in the two provinces it traverses, thereby generating what is known as induced traffic.

The Project offers significant connectivity advantages by establishing improved links to the Aegean Sea region and the Middle East from Europe and İstanbul. It provides an alternate route between Turkey's western (European) side and İzmir, the nation's third-largest city. Furthermore, the Project enhances connectivity along the Gebze-İzmir and Northern Marmara routes, strengthening Turkey's transportation network.

The implementation of the Kınalı-Malkara section is a significant step towards realizing international transportation and logistics corridors within the broader context of the Marmara Motorway Ring Project. This section addresses traffic congestion and declining service levels along the state road connecting Tekirdağ Port,

railway connections, and logistical centres to industrial and tourism zones in the Kınalı-Malkara region. By enhancing efficiency and reducing time and fuel losses, the Project contributes to economic sustainability.

The Project also aims to improve long-distance traffic flows (e.g., from Anatolia/Asia to Europe (e.g., through Greece and Bulgaria), as well as localized traffic along the Istanbul-Izmir industrial belt and leisure / tourist traffic. The Project will improve traffic flow in the two provinces bordering it (typically referred to as induced traffic and will give a variety of connectivity advantages over traditional inter-continental connectivity via Istanbul and the Bosporus Straits, and provide various connectivity benefits including:

- Improved connectivity to the Aegean Sea region and the Middle East from Europe and Istanbul (Türkiye's commercial powerhouse);
- Alternative link between Türkiye's western (European) side and Izmir, the country's third largest city;
- Improved connectivity along with the Gebze-Izmir and Northern Marmara routes.

## 1.3 Project Categorisation

The requirements from IFC and Equator Principles IV regarding the Environmental and Social Assessment process and outcomes differ depending on the category of the Project. Accordingly, all projects are divided in four categories presented in table below:

**Table 3: Project Categorization**

| Category | Description of the Project |
|---|---|
| | **IFC and EP IV** |
| **Category A** | Business activities with potential significant adverse E&S risks and/or impacts that are diverse, irreversible, or unprecedented. |
| **Category B** | Business activities with potential limited adverse E&S risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures. |
| **Category C** | Business activities with minimal or no adverse E&S risks and/or impacts. |
| **Category FI** | Business activities involving investments in financial intermediaries or through delivery mechanisms involving financial intermediation. This category is further divided into three risk categories (FI-1, FI-2, FI-3). |

As per the E&S categorization criteria of the applicable standards given above, the potential scale, complexity, and type of the environmental and social impacts and risks presented by the Project, the categorization, associated with the construction and operation of the Project, is proposed as "***Category A***" in reference to Equator Principles IV and IFC for project categorization.

## 1.4 ESIA Approach

### 1.4.1 Objectives of the ESIA

This ESIA Report has been prepared by WSP Türkiye for the following objectives:

- Identification and assessment of social and environmental impacts, both adverse and beneficial, in the Project's area of influence;

- Evaluation of the main environmental and social risks and potential impacts of the Project;
- Presentation of Environmental and Social Management Plan (“ESMP”), Stakeholder Engagement documentation, and grievance mechanism in line with the Equator Principles (“EP”) IV, and International Finance Corporation (“IFC”) Performance Standards (“PSs”);
- Description of the management, mitigation, monitoring and compensation measures, including the ESMS, the ESMP, and the thematic action or management plans;
- Cumulative impact assessment (as required by the EP IV and IFC PSs); and
- Assessment of associated facilities.

This ESIA Report aims to assess of impacts environmental and social impacts on the physical, biological, and social components related with the Project activities.

A bankable ESIA needs to comply with both the national legislation and international standards. IFC Performance Standard 1 (IFC, 2012) lists the overall objectives for an ESIA, including:

- to identify and assess social and environmental impacts, both adverse and beneficial, in the Project’s area of influence,
- to follow the mitigation hierarchy of avoidance, minimization of impacts, mitigation and if needed compensation, with respect to adverse impacts to workers, other affected people, and the environment,
- to conduct meaningful consultation, and
- to promote improved social and environmental performance of companies through the effective use of management systems.

The main components of the assessment will include:

- the potential environmental and social impacts of the Project throughout the full development cycle – preconstruction, construction, operation, decommissioning,
- a public consultation and disclosure plan to ensure that local communities and other key stakeholders are informed about the Project and have an opportunity to express their opinions concerning the Project,
- proposed mitigation activities to minimize adverse environmental impacts,
- the nature and significance of residual impacts (those adverse impacts that occur after mitigation has been applied) and ongoing monitoring and management plans to address them,
- the nature and significance of cumulative impacts,
- a social management to maximize benefits to the local community and promote a sustainable economy.

The following sections clarify the common approach to be used for the assessment across all disciplines, then provide an overview of the discipline-specific impact analyses to be applied.

### 1.4.2 Key Steps in the ESIA Process

This chapter defines the ESIA process steps and the international standards to be considered during this process. Figure 2 sets out the approach that is being adapted for the ESIA study, which reflects WSP Türkiye’s ESIA methodology. Summary of the ESIA process is presented in Figure 2.

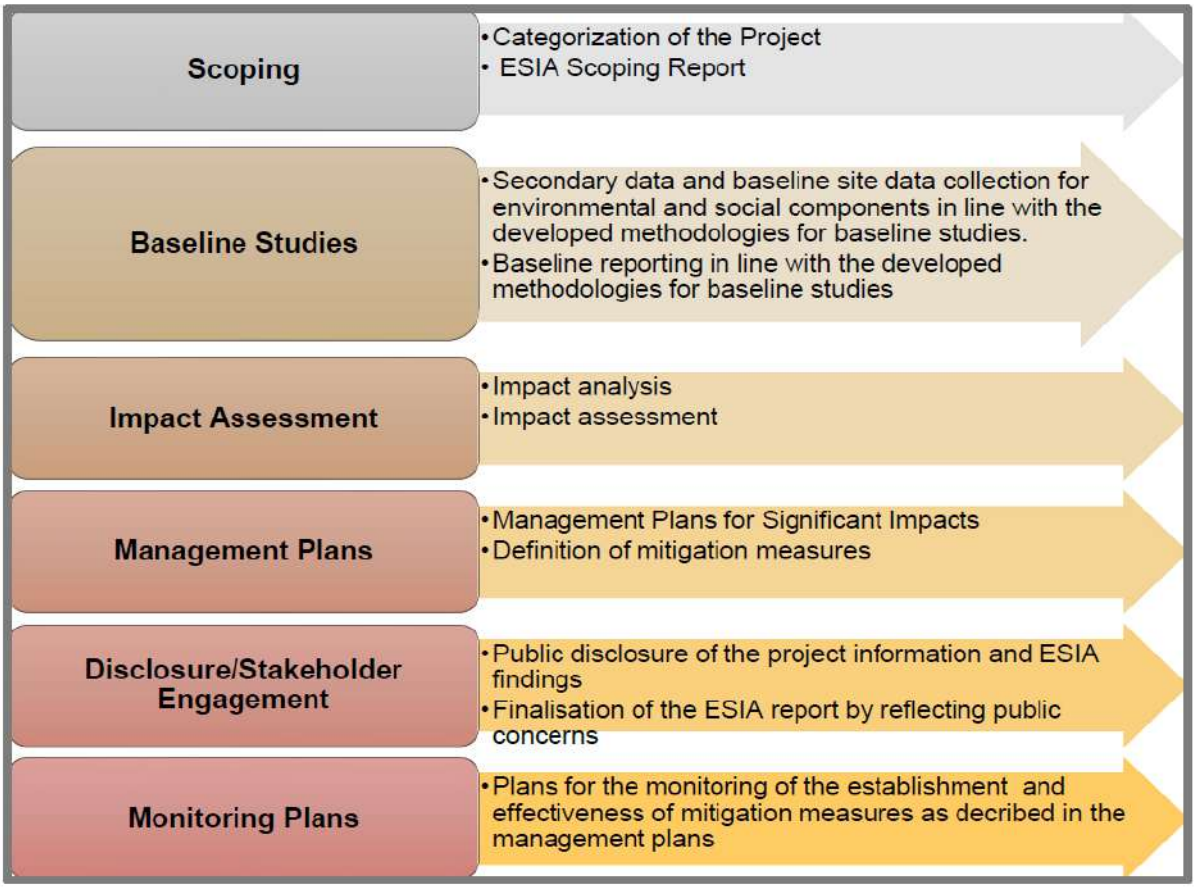



**Figure 2: ESIA process steps**

### 1.4.2.1 Screening and Scoping

The first stage of the ESIA process has been screening and scoping the Project and preparing the gap analysis to identify areas of improvement in the national EIA Report in relation to the relevant international standards, and to suggest actions to close these gaps. The overall role of the study was to review existing technical documents, reports, studies to evaluate the possibility of using the data already available in the preparation of the international ESIA.

Within the scope of the scoping studies of the Project, site visit conducted by WSP-Türkiye Experts on June 8-9$^{th}$, 2022 along the Kınalı-Malkara Motorway route in order to understand the Project status and extent of the environmental and social impacts of the Project.

The purpose of the site visit performed by WSP-Türkiye experts was to identify the key environmental issues associated with the Project that require detailed evaluation as part of the ESIA process in order to establish the most appropriate approach to the assessment and the categorisation of the Project. Major potential environmental and social issues associated with the Project are identified together with the requirement for additional studies on specific issues during that phase.

### 1.4.2.2 Baseline Data Collection

The Project-specific environmental and social baseline studies conducted as part of this Environmental and Social Impact Assessment (ESIA) have gathered baseline information using both desktop research and field-based methods. This compilation of studies, achieved through specially commissioned surveys, draws on various sources, including publicly available data and insights gained from consultations. Information crucial to the assessment process has been duly referenced in the corresponding sections of the ESIA.

Baseline field studies were conducted along the Project Route on the dates given below:

- 22nd-23rd of June 2022 by the expert botanist Prof. Dr. Hayri Duman from Gazi University (Faculty of Science, Dpt. Biology), 25th-26th of June 2022 by freshwater expert Prof. Dr. Aydın Akbulut from Hacettepe University (Faculty of Science, Dpt. Biology) and 22nd – 23rd of June 2022 by expert zoologist Şafak Bulut.
- 24th of May- 3rd of June 2022 for Project Route by an expert from Hermes Arkeoloji Çevre ve Sosyal Danışmanlık Hizmetleri Ltd. Şti. for the cultural heritage sub-component of the impact assessment study.
- 19th of September and 1st of October 2022 by BATI Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti. for the baseline air quality, noise, and vibration measurement campaign.8th -14th January, 2023 by a team of social experts led by a WSP Türkiye Senior social specialist Elçin Kaya for the social baseline and social components of the impact assessment study.
- 27th – 28th of January 2023 by freshwater expert Prof. Dr. Aydın Akbulut from Hacettepe University (Faculty of Science, Dpt. Biology) for second freshwater field survey covering the associated facilities.
- 23rd -24th of January 2023 for associated facilities of the Project by an expert from Hermes Arkeoloji Çevre ve Sosyal Danışmanlık Hizmetleri Ltd. Şti. for the cultural heritage sub-component of the impact assessment study.
- 13th-15th March 2023 by Encon Laboratuvarı A.Ş. for the surface water, groundwater, and soil quality measurement campaign.
- 27-29th April of 2023 by the expert botanist Prof. Dr. Hayri Duman from Gazi University (Faculty of Science, Dpt. Biology), and by expert zoologist Şafak Bulut for second flora and fauna survey covering the associated facilities.
- 2nd -4th , May 2023 by a team of social experts led by a WSP Türkiye Senior social specialist Elçin Kaya and sociologist Esra Güven for additional social baseline and social components of the impact assessment study.

#### *1.4.2.3 Stakeholder Engagement*

IFC require that the Project sponsor consults with the relevant stakeholders;

a) During scoping and before the terms of reference for the ESIA are finalized, and

b) Once a draft ESIA report is prepared. The ESIA report must be made accessible to the public once completed, however it is recommended to consult and inform local stakeholders in earlier phases of the process.

Preliminary engagement activities took place during the social baseline data collection field study which was performed for the ESIA. ÇOK A.Ş. and KGM Representatives participated to social site study and present the Project related information to the local communities. Detailed information is provided about the Stakeholder Engagement in the relevant section of this ESIA report.

#### 1.4.2.4 Impact Assessment

The general methodology adapted by WSP Türkiye for the ESIA has been designed to be highly transparent and to allow an analysis of the impacts on the various environmental and social components. The steps in WSP Türkiye' Impact Assessment Methodology are the following:

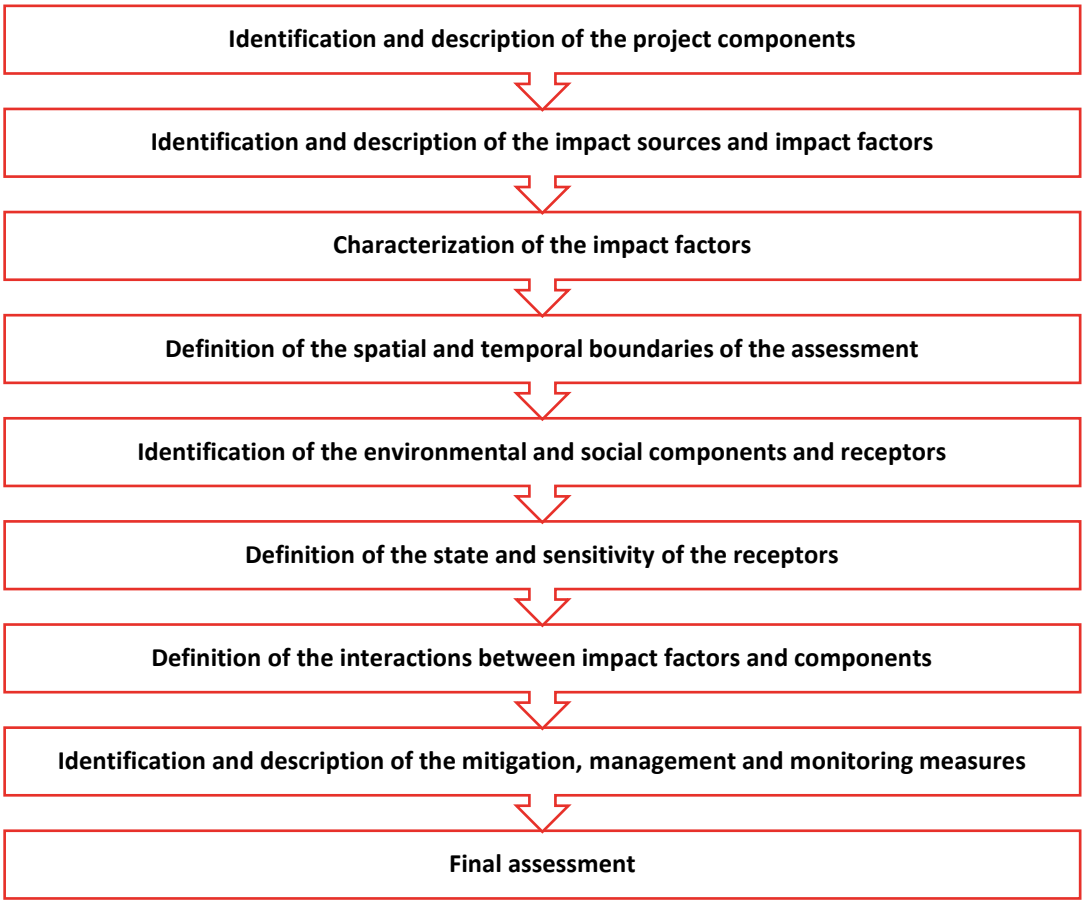



**Figure 3: Steps of WSP Türkiye' Impact Assessment Methodology**

WSP Türkiye's impact assessment methodology is described in detail in Chapter 5 of this report.

##### 1.4.2.4.1 Environmental and Social Components

The impact assessment on individual valued environmental and social components affected in the different Project phases is completed through the use of specific environmental and social impact matrices which compare the component state, expressed in terms of sensitivity, with the relevant impact factors, quantified on the basis of a series of parameters which include:

- Duration (very short, short, medium, long, very long)
- Frequency (single event, infrequent, recurrent, frequent, continuous)
- Geographic extent (Project site, local, regional, national, international); and
- Intensity (negligible, low, medium, high, very high).

The quantification of impacts resulting from each factor acting on the environmental component is obtained by assigning a score to each feature.

Each of the parameters listed above can have a value between 1 and 5. The severity of the impact is determined through an Impact Factor Score which sums the score of each of the 4 parameters, hence it can assume a value between 5 and 20. An Impact Value is then calculated by multiplying the Impact Factor Score and Sensitivity of the component. A final Residual Impact Value is calculated after reversibility and predicted effectiveness of mitigation is also considered.

The semi-quantitative methodology described above allows for an analytical assessment of impacts caused by individual impact factors on individual components. The process therefore ends with a table presenting several residual impacts from different impact factors for each component. It is a synthesis of the impacts on a component from all the impact factors generated by the Project actions.

The impact assessment is expressed based on the assessor's experience, assigning higher weight to the values less favourable to the component's protection, in order to guide the assessment in a conservative manner.

Impacts are presented in separate tables for negative and positive impacts to avoid automatic trade-offs.

The impact assessments for both components are presented in Chapter 7.

#### 1.4.2.4.2 Identification of Mitigation Measures

Mitigation measures were identified through the application of the mitigation hierarchy of avoid, minimize, or, where residual impacts remain, compensate/offset providing the framework for developing a checklist of mitigation measures for risks and adverse environmental and social impacts. This approach implies that priority have been given to preventive actions mainly related to Project design, location, and implementation rather than curative interventions that handle adverse outcomes after the emergence of the anticipated problems.

Realistic and affordable (cost-effective) mitigating measures have been proposed to prevent, reduce, or minimise the impacts to acceptable levels and address other issues such as the need for e.g., worker health and safety improvements, community engagement, institutional involvement.

Given the fact that changes would be possible in the course of the development of the Project, mitigation measures have been designed to adapt to the changes readily through an adaptive management in which the implementation of mitigation and management measures are responsive to changing conditions and the results of monitoring throughout the Project's lifecycle. With this flexibility of the proposed mitigation measures sufficiently considered, it would prevent any unnecessary delay due to further assessment.

### 1.4.3 Environmental and Social Management System

The applicable lenders standards require that an Environmental and Social Management System (ESMS) for the Project is prepared and implemented through the Project lifecycle. The general framework for the environmental and social management system to be developed and implemented by the Project through the Project lifecycle has been described in Chapter 9.0.

## 1.5 Uncertainties

Like most ESIAs, the current ESIA faced a number of challenges in terms of retrieving baseline information, the level of accuracy of predicting impacts, and developing appropriate mitigation. Furthermore, even with a firm Project design and an unchanging environment, predictions are by definition uncertain.

This ESIA is prepared based on the Project information provided by the Client (refer to Chapter 3.0) and the information collected during the site visits. The design of the Project is progressing in parallel with the ESIA studies. Assessments made within the scope of this ESIA Report are based on the most current design. On the other hand, the design and/or optimization of some Project components and associated facilities are still on going.

Areas of uncertainty, data gaps and deficiencies have been highlighted within the relevant sections of the ESIA Report and Chapter 9. In order to address the uncertainties, monitoring will be undertaken by the EPC Contractor to understand whether the identified mitigation measures are sufficient or there is a need for any refinements.

Other important data limitations affecting the assessments made under this ESIA Report are also summarized in Chapter 9.

## 1.6 Structure of the ESIA Report

This document is the ESIA Report for the Project prepared in compliance with the national and international requirements. This document presents the following Chapters:

- Introduction (Chapter 1)
- Regulatory Framework (Chapter 2)
- Project Description (Chapter 3)
- Analysis of Project Alternatives (Chapter 4)
- ESIA Methodology (Chapter 5)
- Environmental and Social Baseline (Chapter 6)
- Environmental and Social Impact Assessment (Chapter 7)
- Cumulative Impact Assessment (Chapter 8)
- ESMS including ESMP (Chapter 9)
- Challenges and Uncertainties (Chapter 10)
- Conclusions (Chapter 11)
- References
- Appendices

# 2.0 REGULATORY FRAMEWORK

This chapter describes the legal framework to be considered in the ESIA Report, management plans and other related documents while describing the management of environmental and social impacts and risks related to the Project and associated facilities. In this context, the Turkish laws and requirements, IFC PSs and guidelines, EU relevant Directives and EPs will be taken into consideration.

Türkiye is on the accession path to EU membership and is in the process of aligning its national environmental legislation and standards to meet EU requirements. Hence, the EU framework for environmental and social protection is particularly relevant to the Project. For the management of certain environmental media, such as air quality, noise management, Turkish standards are already converging with those of the EU.

The Project will be in compliance with the most stringent requirement between national legal requirements and international requirements.

This chapter details the following in particular:

- The relevant institutional framework in Türkiye involved in the regulation of the Project;
- Relevant Turkish environmental and social laws and regulations that are applicable to the Project;
- Relevant EU Directives;
- International treaties, conventions, and protocols relevant to the Project and to which Türkiye is a signatory;
- Environmental and social guidelines and standards developed by international organizations; the EP and IFC PSs;
- Other international guidelines and standards, directly applicable to construction sites, powerlines, associated facilities, etc. which are considered international best practice.

## 2.1 National Legal and Regulatory Framework

### 2.1.1 Environmental Legal and Regulatory Framework

The Turkish legal framework for environmental protection was developed in line with national and international initiatives and standards, and some of them have been revised recently to be harmonized with the EU Directives in the scope of pre-accession efforts of Türkiye to the EU. In the following sections, related institutions, legislation, processes, and procedures that are related to the environmental and social aspects of the proposed Project are described.

The Ministry of Agriculture and Forestry (“MoAF”) is the responsible organization for the issuing and implementation of policies and legislation adopted for the agricultural areas, forestry areas and protected areas.

The Turkish Environment Law No. 2872, which came into force in 1983, deals with environmental issues on a very broad scope. According to the basic principles that govern the application of the Environment Law, and as stated in the Constitution, citizens as well as the state bear responsibility for the protection of environment. Complementary to the Environment Law and its regulations, other laws also govern the protection and conservation of the environment, the prevention and control of pollution, and the implementation of measures for the prevention of pollution.

The Environment Law of 1983 has a comprehensive structure that has a holistic and integrated vision for the environment. “Polluter pays” and “user pays” principles and carrying capacity concepts form the basis of regulatory tools in the Environmental Law. The Law is supported by numerous Regulations and decrees prepared or updated in the process of alignment with EU legislation, thus contributing significantly to compensating the gaps within the former legislative system of Türkiye.

The EU legal instruments, interest approximately 300 directives covering environmental protection, polluting and other activities, production processes, procedures, and procedural rights as well as products, and cross-cutting issues (e.g., EIAs, access to information on the environment and combating climate change). Quality and related emissions standards are set for air, waste management, water, nature protection, industrial pollution control, chemicals and genetically modified organisms, noise and nuclear safety and radiation protection. The EIA Directive of 1985 has been amended three times, in 1997, in 2003 and in 2009. The initial Directive of 1985 and its three amendments have been codified by Directive 2011/92/EU of 13 December 2011. Directive 2011/92/EU has been amended in 2014 by Directive 2014/52/EU.

The EIA Regulation, which dates originally from 1998, has had several revisions and was most recently amended on July 29th, 2022. Although the EIA Regulation has been derived from the EU EIA Directive, the integration of various Turkish conventions, sub-laws and governmental decrees makes the EIA Regulation distinctive in certain respects.

The lead government agency, responsible for environmental protection in Türkiye is the Ministry of Environment, Urbanization and Climate Change (“MoEUCC”). MoEUCC is the responsible organization for the issuing and implementation of policies and legislation adapted for protection and conservation of the environment and for sustainable development and management of natural resources.

The main responsibilities of the MoEUCC, relevant to the Project are:

- implementation of the EIA regulations and decision-making in the EIA approval processes,
- setting policies and principles for environmental management in Türkiye, including the administrative framework for environmental enforcement,
- defining and applying environmental quality standards,
- supervision of the network of environmental laboratories in Türkiye,
- pollution control and inspection activities,
- agroforestry support, soil management and erosion control, and
- protection of Türkiye’s natural heritage including national parks, areas of conservation interest, biodiversity and wildlife.

Turkish National Regulations that are applicable to the Project are provided in APPENDIX A.

### 2.1.2 Environmental Impact Assessment Procedure in Türkiye

The “EIA Regulation” was published in the Official Gazette on July 29th, 2022. According to the regulation, the industries or facilities listed in Annex 1 and Annex 2 of the regulation should obtain an EIA permit. The EIA process is carried out by companies licensed by the MoEUCC. The report submission and official correspondence process is carried out online.

The EIA submission and approval process of the projects listed in Annex 1 is more detailed and longer. It includes scoping and public participation steps, and is directed by the MoEUCC, the central authority. During the process, an application report and an EIA Report are prepared by a licensed company. The “EIA Positive” or “EIA Negative” decision is obtained at the end of the process.

The projects listed in Annex 2 have shorter EIA processes and comprise of smaller industries. The EIA submission and approval process does not include the scoping and public participation steps and is directed by the Provincial Directorate of Environment, Urbanization and Climate Change (“PDoEUCC”). During the process, a Project Introduction File (Pre-EIA Report) is prepared by authorized licensed company. If the “EIA is not

required" decision is obtained, the project can be implemented. However, if "EIA is required" decision is obtained, the same process for the Annex 1 projects, needs to be initiated.

The Turkish EIA procedure follows a process of selection and elimination criteria, with the final decision of the MoEUCC. The MoEUCC, establishes a "EIA Commission", which has considerable influence on the review and supervision of the EIA report. The EIA commission comprises representatives from relevant institutions and establishments and Ministry authorities. This commission is responsible for defining all required studies for the EIA report.

The MoEUCC, when deciding regarding the EIA Report, takes into consideration the studies and decisions made by the EIA Commission.

As so required, the MoEUCC may invite research and specialist organizations, professional associations/chambers, trade unions, associations, and Non-Governmental Organization ("NGO") representatives to the commission meetings. Main steps in the Turkish EIA Process to be followed are as follows:

- First site visit by informing the PDoEUCC before the EIA Application File studies,
- Submission of the EIA Application File to the MoEUCC,
- Public Participation Meeting (announcements in one national and one local newspaper need to be given and other notifications need to be made before the meeting),
- Issuing of the special EIA format by the MoEUCC for the Project (the special EIA format defines baseline and impact assessment studies required specifically for the Project) based on the comments of the EIA commission and outcomes from the Public Participation Meeting,
- Submission of the EIA Report to the MoEUCC,
- Commission meetings during the EIA process,
- Revision and finalization of the EIA Report,
- Public disclosure of the Final EIA Report by PDoEUCC,
- Obtaining final decision from the MoEUCC (EIA Positive or EIA Negative).

An EIA Study was completed in November 2016 for the entire 324, 441 km long motorway in conformance with Turkish EIA regulatory requirements. The EIA, entitled "Kinal-Tekirdağ-Çanakkale-Savastepe 1st and 2nd Section Motorway EIA (2016 Turkish EIA)", was approved by the Ministry of Environment and Urbanization on 23 November 2016. The Project covers the section of the Kınalı-Balıkesir Motorway starting at the Silivri Prison Interchange area of the existing O-3 İstanbul – Edirne Motorway at KM 0+000 and ending at 105+300 for a total of 105.300 km.

### 2.1.3 Land Acquisition Legislation

Fundamental provisions regarding land ownership in Türkiye are set out under the Land Registry Law no 2644. Cadastral arrangements are subject to the Cadastre Law no 3402. Nevertheless, both land registry and cadastre laws have provisions concerning miscellaneous laws. Some of the laws concerning the land acquisition and registry are as follows:

- Expropriation Law (No.2942, 1983, amended in 2022)
- Forest Law (No. 6831, 1956, amended in 2021)

- Pasture Law (No. 4342, 1998, amended in 2018)
- Cadastral Law (No. 3402, 1987, amended in 2020)
- Land Registry Law (No. 2644, 1934, amended in 2021)
- Village Law (Law No. 442, 1924, amended in 2022)
- Law on the Protection of Cemeteries (Law No. 3998, 1994, amended in 2018)
- Civil Code (Law No. 4721, 2001, amended in 2023)
- Settlement Law (Law No. 5543, 2006, amended in 2022)
- Law on Supporting the Development of Forest Villagers, Valuation of Areas Taken out of Forest Area Borders on behalf of the Treasury and Vending of Agriculture Lands Owned by the Treasury (Law No. 6292, 2012, amended in 2023)

The administration action of the expropriation process is performed in line with the Expropriation Law No. 2942 (Issued on 08.11.1983, Official Gazette No. 18215) according to its purpose, authorisation, procedure, reason, and the subject of the action.

**Article 27 of the Expropriation Law (No.2942, 1983, amended in 2022) explains the Urgent Expropriation issues in details:**

No. 3634 in the implementation of the National Défense Obligation Law No. 3634, in cases of expropriation of immovable properties required for the need of national defines or in cases of urgency to be decided by the President of the Republic or in extraordinary situations stipulated by special laws, the court shall, upon the request of the relevant administration, within seven days, determine the value of that immovable property (Amended: 24/4/2001 - 4650/15 Art.) the value of the immovable property to be determined by the experts to be selected in accordance with the principles of Article 10 and in accordance with Article 15 may be seized by the administration on behalf of the owner by depositing it in the bank specified in the invitation and announcement to be made in accordance with Article 10 (Amended phrase: 24/4/2001 - 4650/15 Art.). (1)(2)

The decision of the court to seize the immovable property shall be notified to the land registry office. The provision that the immovable property cannot be transferred, alienated or assigned to another person shall be annotated in the land registry. After the confiscation decision, the immovable property shall be vacated in accordance with Article 20.

The Turkish Government issued the urgent expropriation decision with decision number 7060, dated April 12, 2023, published in the Official Gazette numbered 32162, and pertains to the urgent expropriation of certain properties by KGM for the Kınalı-Tekirdağ-Çanakkale-Savaştepe Motorway Project (Kınalı-Malkara Section). The decision applies to various settlements along the designated route, covering Silivri district in İstanbul and Marmaraereğlisi, Çorlu, Süleymanpaşa, and Malkara districts in Tekirdağ. The urgent expropriation authorizes the entry into lands, construction activities, and the establishment of related facilities necessary for road construction and maintenance. The Decision takes effect upon publication and will be enforced by the Minister of Transport and Infrastructure.

Cadastre Law also defines the process related to identification of owners of land without title deeds or circumstances where there is a confusion on the matter of land possession.

Pursuant to Article 13 of the Cadastre Law, persons who sow the land that is in public ownership for 20 years and are affected by the Project (conventional landowners and persons who sow a defined area of land uninterruptedly for 20 years) have the right to full compensation. However, Article 14 stipulates that this is

applicable for land size up to a total area of 40 decares for wet soil which is not registered in land registry, and which is located within the same work site and 100 decares for dry soil (including 40 and 100 decares).

### 2.1.4 Labour and Occupational Health and Safety (OHS) Legislation

#### *2.1.4.1 General Health and Insurance Law (No. 5510)*

The Social Insurance and General Health Insurance Law No. 5510, enacted in 2006, establishes the legal framework for the country's social security system, encompassing various insurance schemes to protect workers against risks related to health, work-related accidents, disability, old age, and death. The primary aim of this law is to ensure that all employees, self-employed individuals, and other members of society are covered under a comprehensive social security structure, offering financial and medical protection during their working lives and beyond. The law is designed to promote social welfare by providing access to healthcare services and income support in cases of illness, disability, or old age. The Social Insurance Procedures Regulation, the General Health Insurance Regulation, the Regulation on Calculation and Collection of Social Insurance Premiums and the Regulation on Pension Fund and Social Security Institution Procedures are among the regulations that objectify the provisions of the law and ensure the proper functioning of social security implementations.

The law mandates that all employees and workers, regardless of their employment status (e.g., private sector, public sector, self-employed, or informal workers), are required to contribute to insurance schemes through mandatory premium payments. The premiums are calculated based on the income levels of the insured, and the law defines the conditions under which individuals become eligible to receive benefits from these insurance schemes, such as healthcare services, disability benefits, and retirement pensions.

In addition to outlining the rights and obligations of employees, employers, and other individuals covered by social insurance, Law No. 5510 also establishes the role of the Social Security Institution (SGK), which is responsible for the administration of the social security system. SGK oversees the collection of insurance premiums, the distribution of benefits, and the enforcement of the law's provisions. The law stipulates that employers are legally required to register their employees with SGK and ensure that premiums are paid regularly to maintain continuous coverage for their workers.

A significant aspect of this law is the General Health Insurance (GHI) system, which extends healthcare coverage not only to formal workers but also to individuals who are not employed or do not have sufficient income, ensuring that all residents of Türkiye have access to basic healthcare services. Those without sufficient means to pay the premiums are covered by the state through public funding. Furthermore, the law includes provisions for private health insurance, allowing individuals to access supplementary health services beyond those provided by the public system.

The scope of Law No. 5510 is extensive, aiming to create a unified, sustainable, and equitable social security system that can provide comprehensive protection to all segments of society, from employees in the formal economy to informal workers and vulnerable groups. The law also incorporates various safeguards to ensure its sustainability, including measures to prevent fraud and abuse, and it requires periodic adjustments to maintain the financial stability of the system in the face of changing demographic and economic conditions.

#### *2.1.4.2 Labour Law (No. 4857)*

The Labor Law No. 4857, came into force in 2003, serves as the primary legal framework governing the relationship between employees and employers. Its purpose is to regulate the rights and responsibilities of workers in the workplace, ensuring fair treatment, safety, and the protection of labour rights. The law aims to create a balance between the interests of employees and employers, establishing a legal structure that fosters a just and secure working environment. It covers a wide range of aspects, including employment contracts, working conditions, wages, social rights, and occupational health and safety, with the overarching goal of improving the quality of work life and promoting social justice. Regulations such as the Working Hours and

Overtime Regulation, the Occupational Health and Safety Regulation and the Regulation on the Employment of Child and Young Workers in Workplaces, which were issued based on the Labor Law, have introduced detailed regulations on many issues with the aim of protecting the rights of workers and ensuring order in workplaces.

The law governs various stages of the employment relationship, from the initiation of the employment contract to its termination. It defines the rights and obligations of both employees and employers through provisions related to working hours, overtime, annual leave, public holidays, and wage payments. The law sets limits on working hours, stipulates rules for overtime compensation, and mandates the provision of annual leave, among other fundamental labour rights. It also includes critical provisions concerning occupational health and safety, outlining the obligations of employers to maintain a safe working environment and reduce the risk of accidents, workplace injuries, and occupational diseases.

It also addresses the protection of workers against various forms of discrimination and unfair treatment in the workplace. It provides mechanisms for resolving disputes between employees and employers, ensuring that workers can claim compensation through legal channels if their rights are violated. This includes protections against discrimination based on gender, race, or other personal characteristics, and safeguards against unfair dismissal or unjust working conditions. Additionally, the law establishes a framework for collective bargaining and trade union activities, further strengthening workers' rights and ensuring that they have a voice in negotiating working conditions.

The law also takes into account modern developments in the labour market, such as flexible working arrangements, temporary employment and the changing nature of work. It meets the growing need for adaptable labour standards that reflect the changing dynamics of the workforce. It also includes provisions for dispute resolution through mediation and judicial channels to ensure fair and effective management of disputes between employers and employees.

#### *2.1.4.3 Occupational Health and Safety (OHS) Law (No. 6331)*

The Occupational Health and Safety Law No. 6331, enacted in 2012, provides a comprehensive legal framework aimed at ensuring the health and safety of workers in the workplace. The primary purpose of this law is to prevent work-related accidents and occupational diseases, thereby safeguarding the well-being of employees and promoting a safe working environment. The law is designed to establish preventive measures, risk assessments, and the implementation of safety protocols across various industries to reduce workplace hazards. It envisions a collaborative approach where both employers and employees share the responsibility for fostering a culture of safety and health at work. The OHS Risk Assessment Regulation, Regulation on the Procedures and Principles for Employee Occupational Health and Safety Training, Regulation on Emergencies in Workplaces and Employee Health and Safety Regulation are various regulations issued for the implementation of this law. These regulations, which complete the scope of Law No. 6331, provide detailed regulations to ensure healthy and safe working conditions in workplaces.

The law outlines clear obligations for employers in the OHS field. Employers are required to take all necessary precautions to protect the health and safety of their workers. This includes providing adequate safety equipment, conducting regular risk assessments, and ensuring that employees receive appropriate training on safety measures. The law mandates that employers appoint qualified OHS specialists and OHS technicians to oversee and manage safety protocols within the workplace. Furthermore, it requires employers to establish emergency plans, implement measures for handling hazardous materials, and create safe working conditions tailored to the specific risks of the industry. For workplaces with higher levels of risk, additional safety measures are prescribed to mitigate those hazards.

Law No. 6331 also ensures the rights of employees concerning their health and safety at work. Workers are granted the right to request information on safety conditions, raise concerns, and seek redress if they believe

their health and safety are at risk. Employees are empowered to stop work in dangerous conditions without fear of retaliation if they believe there is an immediate and serious threat to their health or safety. In addition, the law emphasizes the importance of ongoing education and training to ensure that workers are continually informed about safety procedures and protocols relevant to their roles. Risk assessments conducted in the workplace are integral to identifying potential hazards and taking preventive actions to address them.

Moreover, the law establishes a framework for the enforcement and oversight of occupational health and safety standards. The Ministry of Labor and Social Security, along with other relevant authorities, is responsible for inspecting workplaces to ensure compliance with safety regulations. These inspections are designed to identify and rectify violations of safety standards, with penalties imposed on employers who fail to adhere to the law. The law also encourages the development of safety culture through awareness campaigns, promoting continuous improvement in safety practices, and increasing public and corporate knowledge of occupational health and safety issues.

Examples of regulations associated with each law mentioned above are given. Three of these regulations are briefly presented below.

### *OHS Risk Assessment Regulation*

This regulation imposes obligations on employers to identify existing or potential hazards in the workplace and assess the risks they may pose to OHS. The regulation requires employers to identify hazards, analyse the potential harm they may cause, and take necessary measures to minimize possible risks. Risk assessments must be conducted regularly and should cover all employees in the workplace. Employers are required to work with OHS experts to assess risks and ensure that appropriate measures are implemented to control them. Additionally, employees must be informed of the results of the risk assessment and provided with training. This regulation is considered an important step in preventing workplace accidents and occupational diseases.

### *Regulation on Emergencies in Workplaces*

The Regulation on Emergencies in Workplaces establishes the measures to be taken and the procedures to be followed in case of emergencies that may occur in the workplace. The regulation mandates the preparation of emergency plans for situations such as fire, earthquake, explosion, or toxic gas leaks, and requires these plans to be effectively implemented. Employers are responsible for ensuring that employees receive training on how to respond in emergencies and for designating emergency exit routes. Additionally, the regulation stipulates the regular inspection of emergency equipment and the conducting of emergency drills. This regulation aims to ensure that workplaces are prepared for emergencies and to safeguard the safety of employees.

### *Regulation on the Procedures and Principles for Employee Occupational Health and Safety Training*

The Regulation defines the scope and procedures for training employees in OHS to ensure they acquire the necessary knowledge and skills. The regulation mandates that employees receive periodic training on occupational accidents and work-related disease risks to protect them. The content of the training is tailored to the specific activities and risks of the workplace, and methods for measuring and evaluating the effectiveness of the training are also established. Additionally, employers are required to ensure that all employees complete the training within a specified period. This regulation is considered a critical measure for ensuring safe working conditions and protecting employees in the workplace.

## 2.2 International Environmental, Health, Safety and Social Requirements

### 2.2.1 EU Environmental Legislation

The EU Directives on environmental and social protections are considered during the preparation the ESIA are presented in Appendix A.

### 2.2.2 Equator Principles IV (2020)

The Equator Principles (EPs) are a set of voluntary environmental and social guidelines that have been adapted by a significant number of financial institutions influential in the Project finance market (collectively the Equator Principles Financial Institutions, EPFIs). The EPs comprise a set of ten broad principles that are underpinned by the environmental and social policies, standards and guidelines.

The EPFIs emphasize that they will not provide loans to projects where the borrower will not or is unable to comply with the EPFIs social and environmental policies and procedures that implement the Equator Principles.

The EPFIs have ten (10) principles:

- Equator Principle 1: Review and Categorization
- Equator Principle 2: Environmental and Social Assessment
- Equator Principle 3: Applicable Environmental and Social Standards
- Equator Principle 4: Environmental and Social Management System and Equator Principles Action Plan
- Equator Principle 5: Stakeholder Engagement
- Equator Principle 6: Grievance Mechanism
- Equator Principle 7: Independent Review
- Equator Principle 8: Covenants
- Equator Principle 9: Independent Monitoring and Reporting
- Equator Principle 10: Reporting and Transparency

The Project will follow all of the principles as each one pertains to the ESIA process of the Project.

### 2.2.3 IFC Performance Standards

The eight IFC PSs establish the standards that a project is to meet throughout the life of an investment by the IFC or any other relevant financial institution. These are the following:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labour and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety, and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage

All the standards, except Performance Standard 7, will be followed since the Project does not affect any Indigenous Peoples, defined as distinct social and cultural groups with collective attachment to geographically distinct habitats or ancestral territories, and who have historically been marginalized or vulnerable.

#### 2.2.3.1 IFC General EHS Guidelines

The General EHS Guidelines (dated April 30th, 2007) provide guidance to users on common EHS issues potentially applicable to all industry sectors. During the design, construction, operation, and decommissioning of a project (the Project lifecycle) the Project owner will consider ambient conditions and apply pollution prevention and control technologies and practices (techniques) that are best suited to avoid or, where avoidance is not feasible, minimize or reduce adverse impacts on human health and the environment while remaining technically and financially feasible and cost-effective. The Project-specific pollution prevention and control techniques included in General EHS Guidelines involve the subjects listed below:

- Air emissions and ambient air quality,
- Energy conservation,
- Wastewater and ambient water quality,
- Water conservation,
- Hazardous materials management,
- Waste management,
- Noise,
- Contaminated land,
- Occupational Health & Safety,
- Community Health & Safety, and
- Construction and Decommissioning.

#### 2.2.3.2 IFC, Environmental, Health and Safety Guidelines for Toll Roads

The EHS Guidelines for Toll Roads include information relevant to construction, operation and maintenance of large, sealed road projects including associated bridges and overpasses. Issues associated with the construction and operation of maintenance facilities are addressed in the General EHS Guidelines. The EHS Guidelines for Toll Roads is organized according to the following sections:

- Section 1.0 — Industry-Specific Impacts and Management
  - 1.1 Environment
  - 1.2 Occupational Health and Safety
  - 1.3 Community Health and Safety
- Section 2.0 — Performance Indicators and Monitoring
  - 2.1 Environment

- 2.2 Occupational Health and Safety

- Section 3.0 — References and Additional Sources
- Annex A — General Description of Industry Activities

Environmental issues specific to construction and operation of roads include the following:

- Habitat alteration and fragmentation
- Stormwater
- Waste
- Noise
- Air emissions
- Wastewater

Occupational health and safety issues associated with the construction and operation of roads primarily include the following:

- Physical hazards
- Chemical hazards
- Noise

Significant community health and safety issues associated with road projects may also include:

- Pedestrian safety
- Traffic safety
- Emergency preparedness

#### *2.2.3.3 IFC, Environmental, Health and Safety Guidelines for Construction Material Extraction*

The EHS Guidelines for Construction Material Extraction includes information relevant to construction materials extraction activities such as aggregates, limestone, slates, sand, gravel, clay, gypsum, feldspar, silica sands, and quartzite, as well as to the extraction of dimension stone. It addresses stand-alone projects and extraction activities supporting construction, civil works, and cement projects. Although the construction materials extraction guidelines emphasize major and complex extraction schemes, the concepts are also applicable to small operations.

The following environmental issues are depicted within the scope of the IFC guidelines:

- Air Emissions
- Noise and Vibrations
- Water
- Waste
- Land Conversion

Occupational health and safety issues associated with the construction and operation of roads primarily include the following:

- Respiratory hazards
- Noise
- Physical hazards

Significant community health and safety issues associated with road projects may also include:

- Land instability
- Water
- Explosive safety
- Decommissioning

#### 2.2.3.4 IFC, Environmental, Health and Safety Guidelines for Retail Petroleum Networks

The EHS Guidelines for Retail Petroleum Networks include information relevant to retail petroleum networks primarily dedicated to the sale of petroleum-based automotive fuels, including Liquid Petroleum Gas (LPG) and Compressed Natural Gas (CNG), and which may provide limited vehicle repair and washing services. Guidance applicable to bulk storage and distribution of petroleum or petroleum-related products is presented in the EHS Guidelines for Crude Oil and Petroleum Product Terminals. This document is organized according to the following sections:

- Section 1.0 — Industry-Specific Impacts and Management
- Section 2.0 — Performance Indicators and Monitoring
- Section 3.0 — References
- Annex A — General Description of Industry Activities

The following environmental issues are depicted within the scope of the IFC guidelines:

- Leaks and spills
- Wastewater
- Waste management
- Emissions to air

Occupational health and safety issues associated with the construction and operation of roads primarily include the following:

- Chemical hazards
- Fire and explosions
- Confined spaces

According to the Guideline, community health and safety issues associated with the operation of retail petroleum sites are generally negligible for well-designed and managed facilities. These may include potential public exposure to spills, fires, and explosions. Nevertheless, facilities should prepare a formal emergency preparedness and response plan that considers the role of communities and community infrastructure as appropriate in responding to emergency events.

## 2.3 International Agreements

Türkiye is a signatory to a number of key international environmental agreements and has incorporated the provisions into national legislation. The key international agreements are summarized below.

### Agreements on the Protection of Environmental & Natural Resources

Türkiye is a signatory to the international agreements relating to environmental management and these agreements are presented in Appendix A.

### Agreements Relating to Protection of Social and Cultural Resources

Türkiye is a signatory to the international agreements relating to social management and these agreements are presented in Appendix A.

Türkiye has not signed the Convention on the Protection and Promotion of the Diversity of Cultural Expressions, Paris, 2005.

Türkiye's participation in these international treaties has been taken into account in the development of appropriate management plans for protection of the environment.

### Labour Relations and Workers' Rights

There are total of 59 conventions ratified by Türkiye, of which 55 are in force, 1 instrument abrogated; none have been ratified in the past 12 months.

The list of all relevant International labour Organization ("ILO") conventions ratified by Türkiye are given in Appendix A.

### Hazardous Substances

Türkiye is a signatory of several conventions and protocols on hazardous substances, those relevant to the Project are listed in Appendix A.

## 2.4 Requirements of Environmental Limits in Turkish Regulations, European Regulations, IFC Guidelines

A review of applicable IFC Guidelines, European Regulations and National Legislation for air quality, water quality, soil quality, noise and vibration were performed and is presented in Appendix A.

According to the recommendations of the IFC guidelines, when national regulations differ from levels and measures presented in the international standards, the Project is expected to achieve whichever is more stringent where possible[1].

Project Standards are presented in Appendix A. The criteria used to define Project Standards are as follows:

- In the presence of different limits in national and international standards (EU, IFC and national regulations) the most stringent one is adopted as Project Standard.
- In the absence of the EU or IFC limits, national limits are adopted as Project Standards.

[1] Türkiye is a candidate country in joining EU and thus along with other environmental requirements, air quality limit values explained in the regulations of Türkiye have been aligned to the EU standards. IFC General EHS Guidelines (i.e. EHS Guidelines: Environmental - Air Emissions and Ambient Air Quality) states that IFC air quality standards will be applied in the absence of national relevant ambient quality guidelines and standards. Therefore, Turkish regulatory air quality limit values will be taken into consideration in assessing Project's possible air quality impacts.

# 3.0 PROJECT DESCRIPTION

## 3.1 Project Overview

The Kınalı-Tekirdağ-Çanakkale-Savaştepe Motorway (Kınalı-Balıkesir motorway) is one of the component of the broader Marmara Motorway Ring Project announced by the Turkish Government in 2015, which includes İstanbul-İzmir Motorway, the Northern Marmara Motorway, and the Kınalı-Tekirdağ-Çanakkale-Savaştepe Motorway.

The total length of the Kınalı-Balıkesir Motorway is 324.441 km, and the Kınalı-Balıkesir Motorway has obtained National Environmental Impact Assessment ("EIA") Positive Decision from MoEUCC on 23.11.2016.

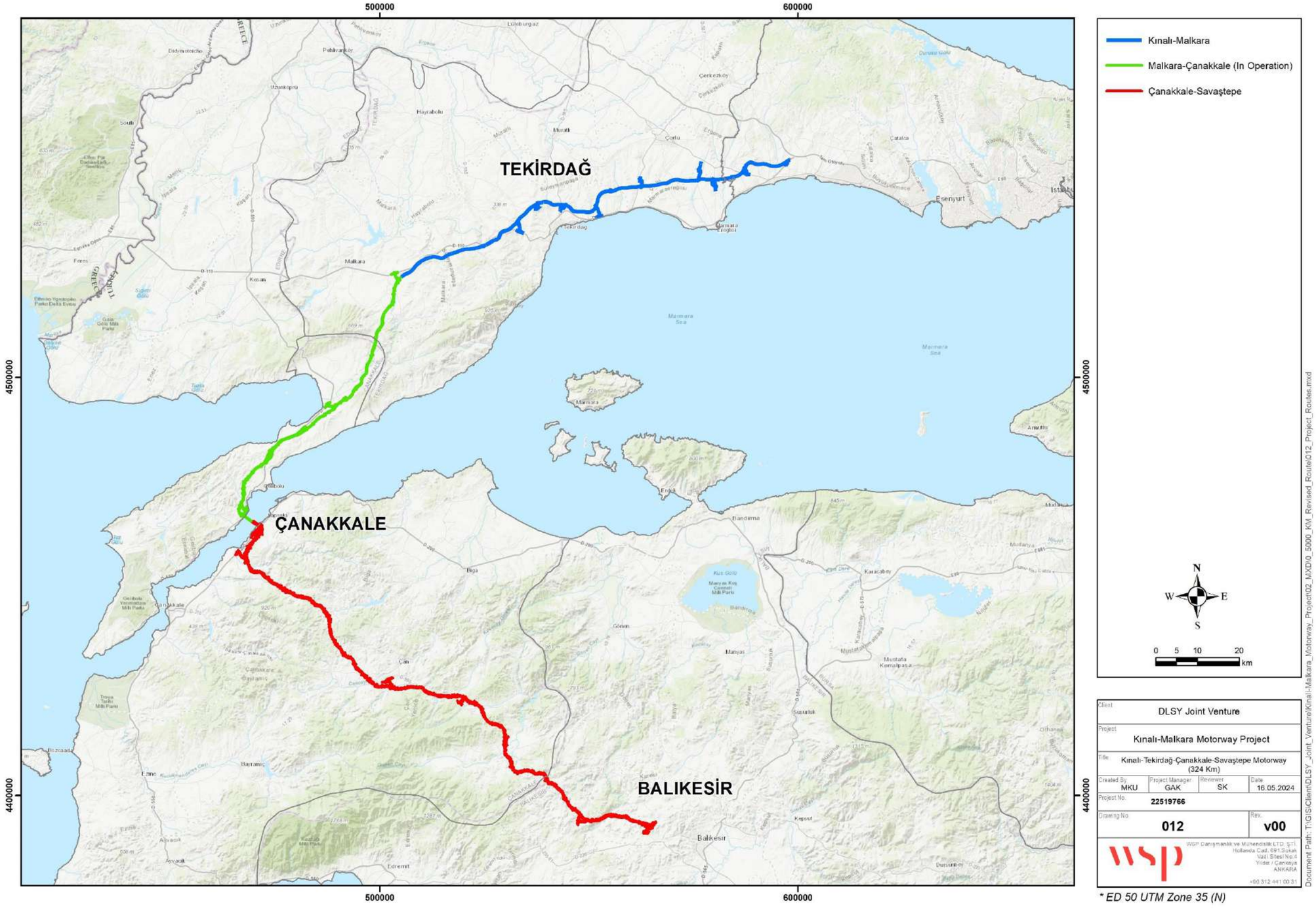
Within the scope of the national EIA report, the Kınalı-Balıkesir Motorway route was divided into two sections considering the Project design technique and regional divisions. The route of Kınalı-Balıkesir Motorway has been divided into further sections since sub divided sections has been assigned to be constructed by different contractors.

According to the national EIA report (2016), the Kınalı-Balıkesir Motorway corridor starts from the Kınalı-1 Interchange area of the existing O-3 (TEM) İstanbul – Edirne Motorway. Then, it continues westward by Marmara Ereğlisi and Çorlu District. It continues from the north of Tekirdağ City Centre and passes through the south of Malkara settlement and north of Şarköy District. Then it turns southwest and reaches the Gelibolu Peninsula from the east of the Evreşe District. Motorway passing through the north of the Gelibolu settlement, reaches the 1915Çanakkale Bridge, which is in the area between Sütlüce and Şekerkaya.

Following the completion of the 1915Çanakkale Bridge, the route veers southeast, bypassing Lapseki District to the south, and proceeds to Çan District. The Motorway skirts the southern edge of Çan District before bending northward around Yenice District, traversing its northern part. Beyond Yenice District, the Motorway shifts southeast towards Balya District. Upon crossing south of Balya District, it redirects towards Balıkesir Province, eventually linking with the Gebze-İzmir Motorway on the western side of Balıkesir Province.

As shown in Figure 5, the Project covers the section of the Kınalı-Balıkesir Motorway starting at the Silivri Prison Interchange area of the existing O-3 İstanbul – Edirne Motorway at KM 0+000 and ending at 105+300 for a total of 105.300 km.

To date, the construction of "**Malkara – Çanakkale Section",** including the 1915Çanakkale Bridge of the Motorway has been completed and is currently in operation (shown in green on Figure 4). "**Çanakkale-Savaştepe Section**" (shown in red on the Figure 4) of the Kınalı-Balıkesir Motorway have not been constructed yet. The Project (105.3 km "**Kınalı-Malkara Motorway"** shown in blue on the Figure 4) is subject to this ESIA Report and in the planning/design and pre-construction phase. The Kınalı-Malkara Motorway route is presented in Figure 5 and overview of the Kınalı-Balıkesir Motorway including the Project (Kınalı-Malkara Motorway Section) is shown in Figure 4.




* ED 50 UTM Zone 35 (N)

**Figure 4: Overview of the Kınalı-Balıkesir Motorway**

## 3.2 Project Area

### 3.2.1 Project Location

The 105.3 km Kınalı-Malkara Motorway Project will start from Silivri District of İstanbul Province and will pass through Çerkezköy, Ergene, Çorlu, Muratlı and Süleymanpaşa districts of Tekirdağ Province. Project location and general layout of the Project are presented in Figure 5 and following figures, respectively. The provinces and districts that Project will pass through between 0+000 km and 105+300 km are given in detail below.

- İstanbul Province, Silivri District (0+000 km - 17+700 km)
- Tekirdağ Province, Marmaraereğlisi District (17+700 km - 25+200 km)
- Tekirdağ Province, Çorlu District (25+200 km - 43+600 km)
- Tekirdağ Province, Süleymanpaşa District (43+600 km - 95+600 km)
- Tekirdağ Province, Malkara District (95+600 km - 105+272 km)

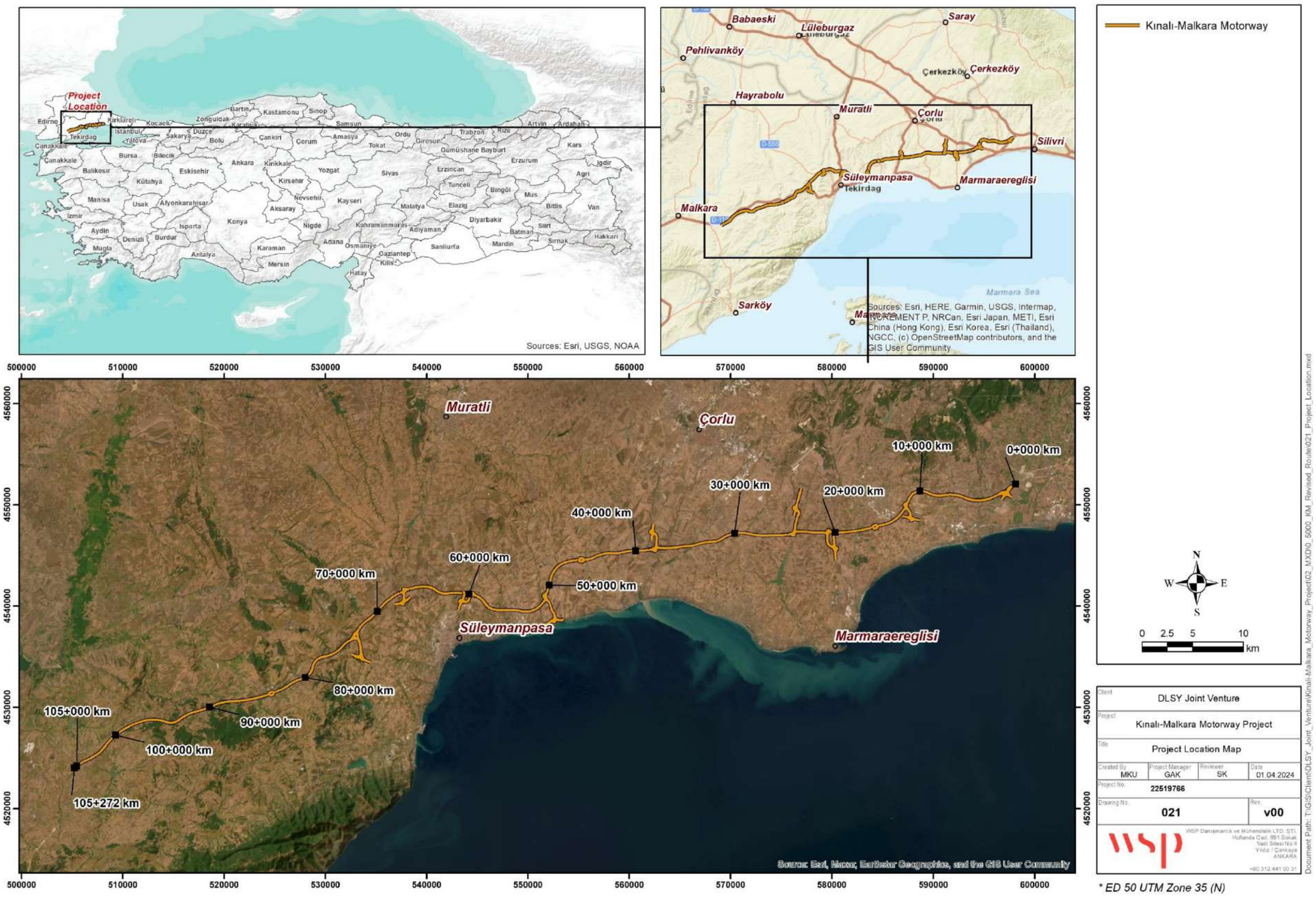



**Figure 5: Kınalı-Malkara Motorway Route**




**Figure 6: General Layout of the Project**

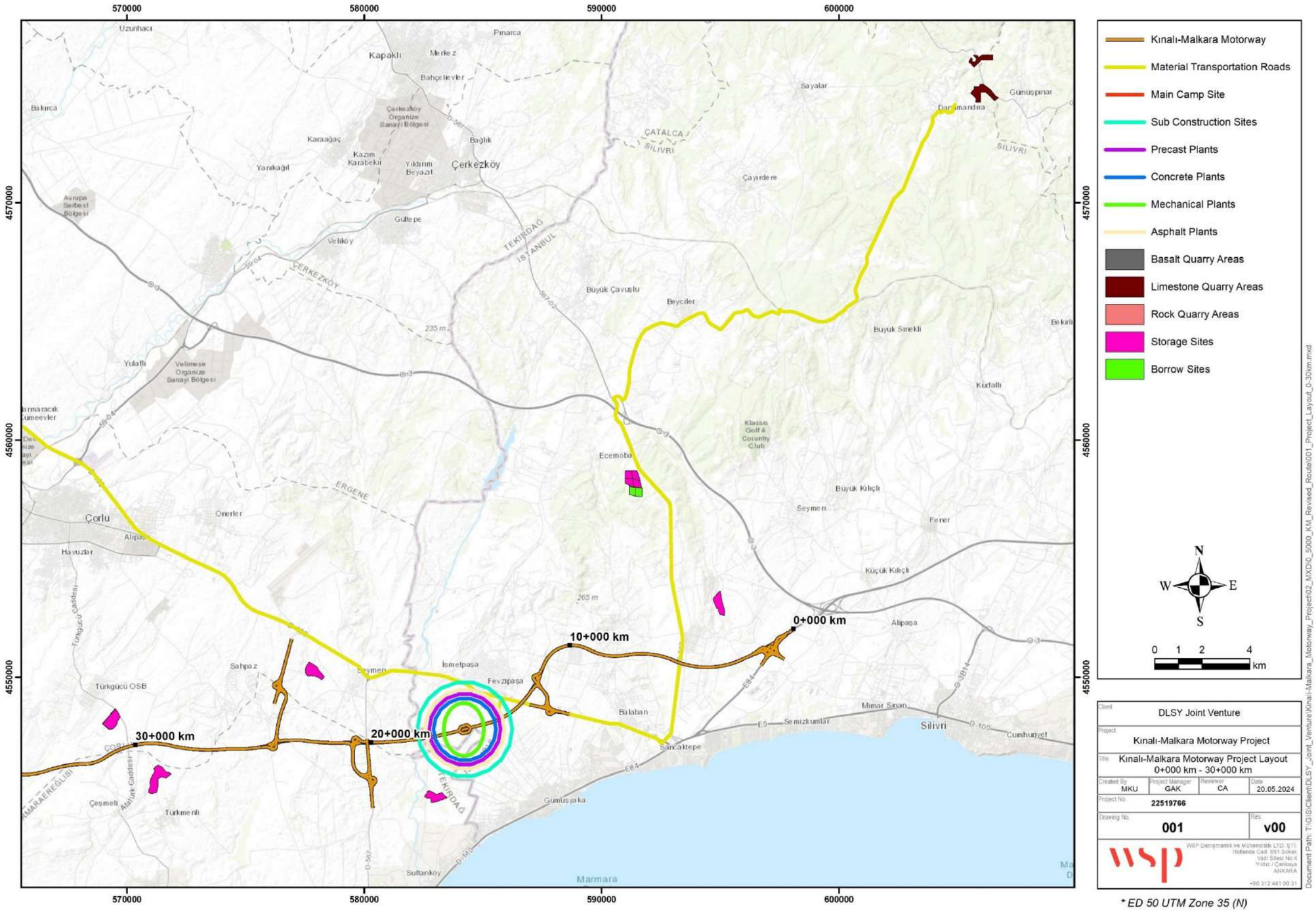



**Figure 7: 0-30km**

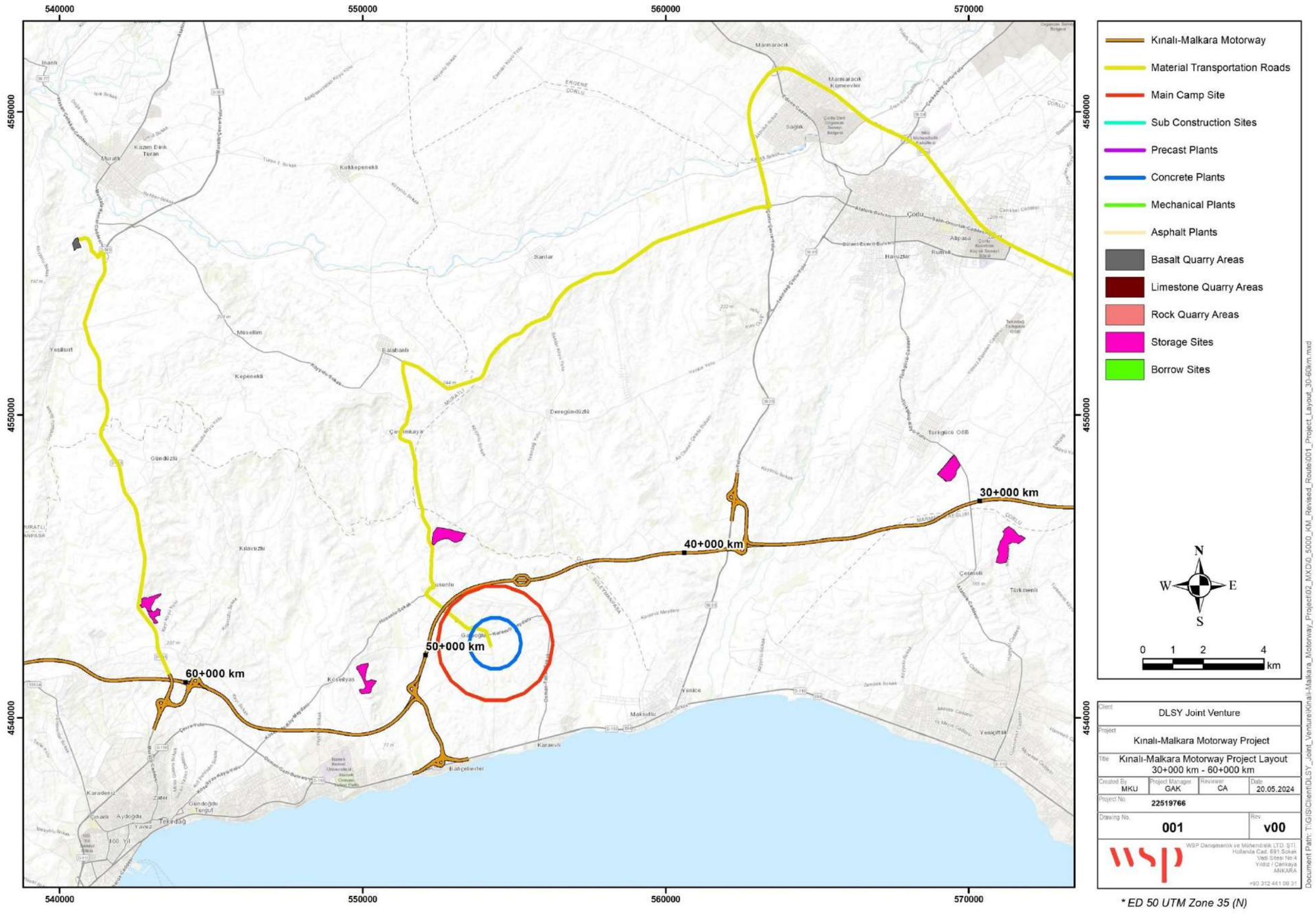



**Figure 8: 30-60km**

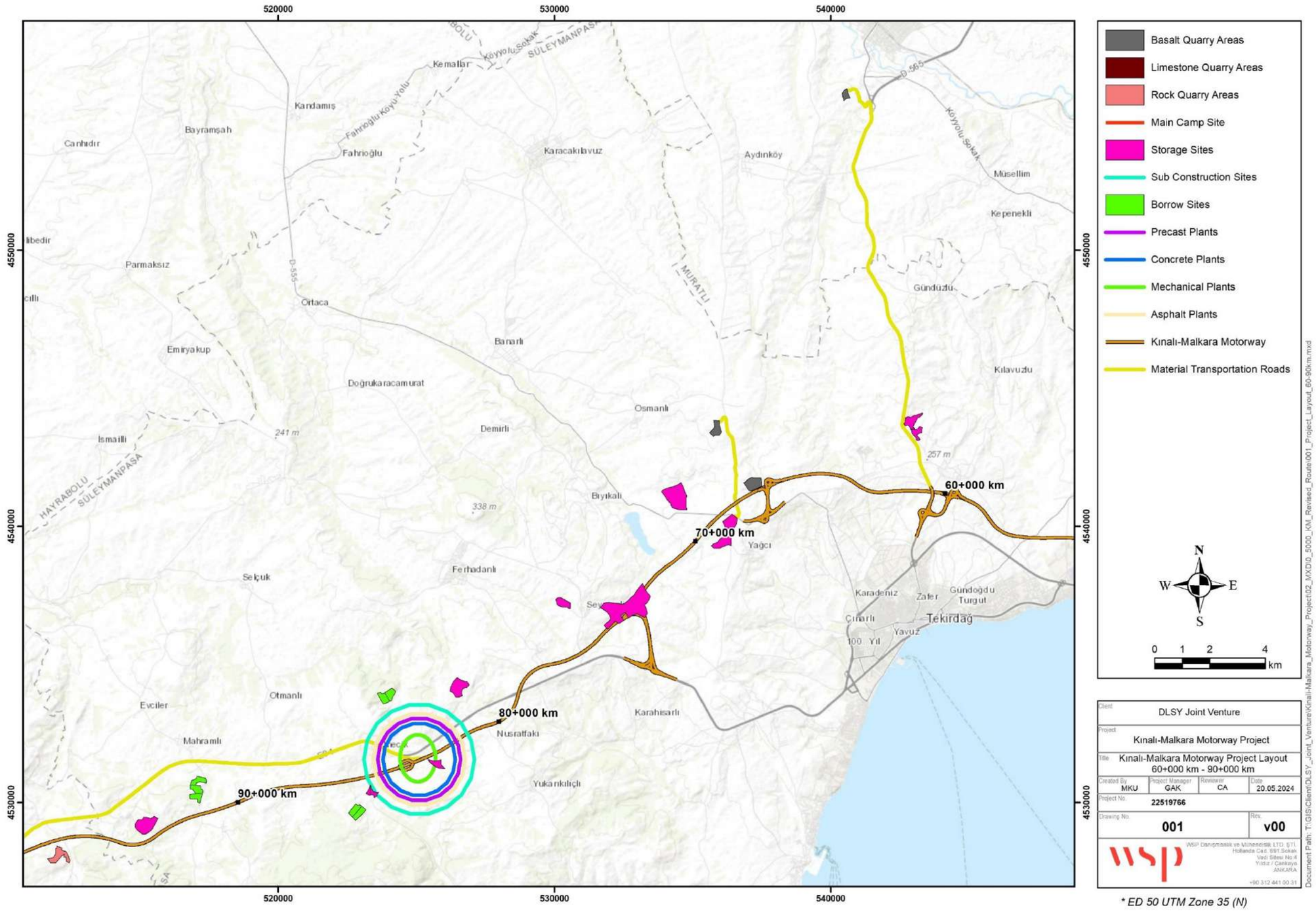



**Figure 9: 60-90km**

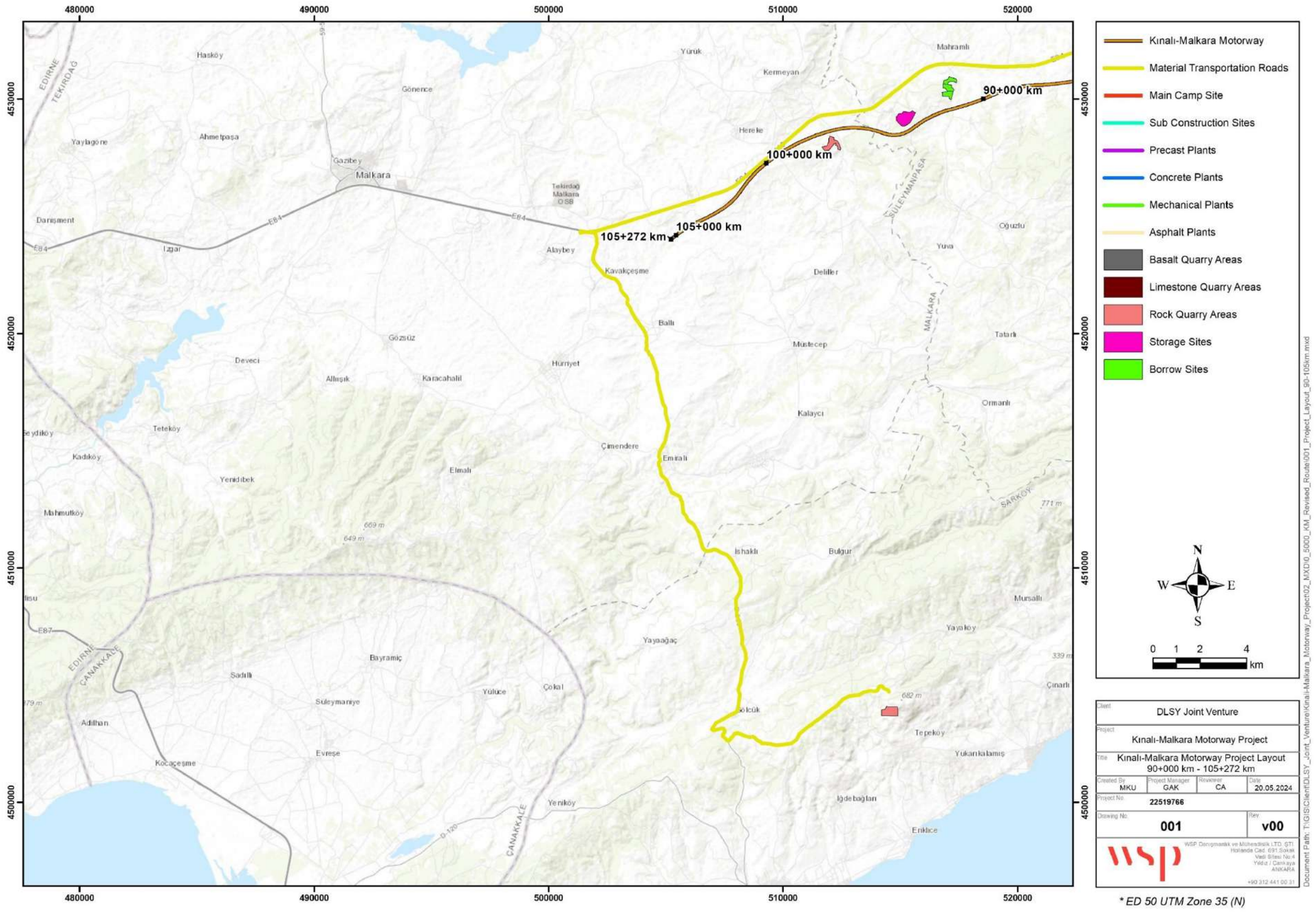



**Figure 10: 90-105 km**

### 3.2.2 Land Use

The Project includes approximately 105 km motorway and in total 329 Project units including 60 overpasses, 28 portal underpasses, 13 girder underpasses, 218 culverts and 10 interchanges.

The existing land use of the AoI of the Project will be affected by the construction of the Project and its components as well as by the associated facilities. There will be loss of public and private lands since the project execution will require partial or complete acquisition of land.

The Project execution will require permanent acquisition of land by using expropriation. The Project may economic displacement and physical resettlement, however, at this stage, the magnitude of displacement is not completely known since the land acquisition files have not been prepared for the Project.

The expropriation process has not started for the project. The expropriation lists are under development, and once these lists are completed, expropriation plans will be developed and submitted to the authorities for approval. After the expropriation plans are approved, the expropriation process will begin.

## 3.3 Project Components

### 3.3.1 Motorway Design

The Project route is planned as 2x3 lanes. Most of the interchange ramps in the Project will be double lanes except from the small section of Silivri Prison Interchange. If the lane width of the interchange ramp needs to be extended (curves with a radius less than 150 m), the expansion ratio will be applied linearly along the transition curve or the superelevation transition zone. On the other hand, the access roads of the Project will be designed as 2x2 lanes. Sample sections/images of the motorway are presented in Appendix B.

### 3.3.2 Structures and Key Infrastructure

Information about the overpasses, underpasses, culverts, and interchanges in the scope of Kınalı-Malkara Motorway Project is presented in Table 4. No viaducts or tunnels will be constructed for the Project.

**Table 4: Number of Overpasses, Underpasses, Culverts, and Interchanges along the Sections of the Motorway**

| Type of Structures | | Number of Structures |
|---|---|---|
| **Overpass** | | 60 |
| **Underpasses** | **Portal Underpass** | 28 |
| | **Girder Underpass** | 13 |
| **Culvert** | | 218 |
| **Interchange** | | 10 |

**Overpass:** It is a bridge, road, railway or similar structure that crosses over another “road” or “railroad”.

**Underpass:** It is a road or a pedestrian passage in a tunnel that runs underneath a “road” or “railroad”.

**Culvert:** A culvert is a structure that allows water to flow under a road, railroad, trail, or similar obstruction from one side to the other side.

**Interchanges**: Interchanges are the components of the Project for the connection of the motorway with the existing and planned road network in the region. The location of interchanges is determined according to the position of the designed alignment route in relation to the existing road network. The design of the interchange

is a result of secondary road ranking. Interchanges are designed with full connections. The dimensions of the layout elements of the interchanges are related to the existing spatial constraints.

The following tables present the list of overpasses, underpasses, and interchanges designed in the Kınalı-Malkara Project.

**Table 5: List of Overpasses of the Kınalı-Malkara Motorway Project**

| Main Road Kilometres | Location | Width (m) | Length (m) |
|---|---|---|---|
| 1+184 | Main road (Silivri Cezaevi Interchange) | 13.5 | 50 |
| 2+364 | Side road (A ramp) | 12 | 25 |
| 2+364 | Main road | 12 | 60 |
| 2+364 | Side road (Kınalı Interchange) | 12 | 25 |
| 2+745 | Main road | 13.75 | 70 |
| 5+822 | Main road | 12 | 50 |
| 6+118 | Main road | 12 | 50 |
| 8+700 | Main road | 12 | 50 |
| 9+479 | Main road | 12 | 50 |
| 11+097 | Main road | 12 | 60 |
| 11+828 | Main road | 12 | 50 |
| 12+970 | Çanta Interchange (State Road) | 13.75 | 50 |
| 12+970 | Main road (Çanta Interchange) | 13.75 | 55 |
| 14+787 | Main road | 12 | 50 |
| 16+099 | Main road | 12 | 50 |
| 20+902 | Marmara Ereğlisi Interchange (State Road) | 12.75 | 60 |
| 21+503 | Marmara Ereğlisi Interchange (State Road) | 13.25 | 50 |
| 21+503 | Main road (Marmara Ereğlisi Interchange) | 13.75 | 55 |
| 24+206 | Main road | 12 | 50 |
| 24+990 | Main road | 12 | 50 |
| 26+292 | Çorlu Airport Interchange | 12 | 60 |
| 26+292 | Çorlu Airport Interchange | 12 | 50 |
| 26+292 | Main road (Çorlu Airport Interchange) | 13.75 | 60 |
| 27+643 | Main road | 12 | 50 |
| 30+252 | Main road | 12 | 50 |
| 31+064 | Main road | 12 | 50 |
| 36+763 | Main road | 12 | 50 |

| Main Road Kilometres | Location | Width (m) | Length (m) |
|---|---|---|---|
| 38+746 | Main road (Karatepe Interchange) | 13.75 | 60 |
| 38+746 | Karatepe Interchange | 13.75 | 50 |
| 42+033 | Main road | 12 | 50 |
| 47+701 | Main road | 12 | 50 |
| 48+533 | Main road | 12 | 50 |
| 50+648 | Main road | 12 | 50 |
| 52+127 | Main road (Tekirdağ East Interchange) | 13.75 | 55 |
| 52+127 | Tekirdağ East Interchange (State Road) | 13.75 | 50 |
| 54+218 | Main Road | 12 | 50 |
| 58+108 | Main Road | 12 | 50 |
| 60+590 | Main Road (Tekirdağ Interchange) | 13.75 | 60 |
| 60+590 | Tekirdağ Interchange (State Road) | 20+12.75 | 50 |
| 61+230 | Main Road (Tekirdağ Interchange) | 12.75 | 105 |
| 62+258 | Main Road | 12 | 50 |
| 63+868 | Main Road | 12 | 50 |
| 66+357 | Main Road | 12 | 55 |
| 67+075 | Hayrabolu Interchange (State Road) | 13.75 | 55 |
| 67+075 | Main Road (Hayrabolu Interchange) | 13.75 | 70 |
| 68+625 | Main Road | 12 | 50 |
| 69+276 | Main Road | 12.75 | 65 |
| 70+554 | Main Road | 12 | 55 |
| 73+844 | Main Road (Tekirdağ West Interchange) | 13.75 | 55 |
| 73+844 | Main Road | 13.75 | 50 |
| 76+492 | Main Road | 12 | 50 |
| 78+108 | Main Road | 12 | 55 |
| 81+178 | Main Road | 12 | 50 |
| 87+548 | Main Road | 12 | 50 |
| 89+579 | Main Road | 12 | 50 |
| 93+473 | Main Road | 12 | 50 |

| Main Road Kilometres | Location | Width (m) | Length (m) |
|---|---|---|---|
| 94+973 | Main Road | 12 | 50 |
| 95+913 | Main Road | 12 | 50 |
| 100+528 | Main Road | 12 | 55 |
| 105+797 | Main Road | 12 | 60 |

**Table 6: List of Underpasses of the Kınalı-Malkara Motorway Project**

| Main Road Kilometres | Location | Width (m) | Length (m) |
|---|---|---|---|
| **Portal Underpass** | | | |
| 0+477 | Main Road | 9 | 50 |
| 4+620 | Main Road | 9 | 49 |
| 4+918 | Main Road | 9 | 46 |
| 17+670 | Main Road | 9 | 56 |
| 18+265 | Main Road | 9 | 46 |
| 21+503 | Marmara Ereğlisi Interchange | 7 | 90 |
| 26+292 | Çorlu Airport Interchange | 12 | 85 |
| 32+572 | Main Road | 7 | 76 |
| 40+226 | Main Road | 9 | 105 |
| 43+798 | Main Road | 9 | 42 |
| 45+408 | Main Road | 12 | 62 |
| 49+113 | Main Road | 12 | 40 |
| 52+127 | Tekirdağ East Interchange | 9 | 55 |
| 52+653 | Main Road | 9 | 88 |
| 53+303 | Main Road | 7 | 107 |
| 55+848 | Main Road | 12 | 50 |
| 57+235 | Main Road | 9 | 94 |
| 59+270 | Main Road | 9 | 50 |
| 60+590 | Tekirdağ Interchange | 12 | 49 |
| 72+481 | Main Road | 9 | 70 |
| 79+612 | Main Road | 12 | 82 |
| 83+698 | Main Road | 7 | 60 |
| 85+889 | Main Road | 12 | 102 |
| 90+298 | Main Road | 9 | 72 |
| 92+351 | Main Road | 12 | 50 |
| 97+685 | Main Road | 12 | 52 |

| Main Road Kilometres | Location | Width (m) | Length (m) |
|---|---|---|---|
| 102+073 | Main Road | 12 | 70 |
| 104+714 | Main Road | 12 | 40 |
| **Girder Underpass** | | | |
| 3+733 | Main Road | 17.5 | 60 |
| 4+418 | Main Road | 17.5 | 105 |
| 7+128 | Main Road | 17.5 | 60 |
| 14+018 | Main Road | 17.5 | 50 |
| 18+579 | Main Road | 17.5 | 100 |
| 25+613 | Main Road | 17.5+25 | 50 |
| 35+381 | Main Road | 17.5 | 50 |
| 39+308 | Main Road | 22.5+30 | 50 |
| 44+100 | Main Road | 17.5 | 200 |
| 63+414 | Main Road | 17.5 | 110 |
| 79+458 | Main Road | 17.5 | 60 |
| 85+521 | Main Road | 17.5 | 50 |
| 92+504 | Main Road | 17.5 | 60 |

**Table 7: List of Interchanges of the Kınalı-Malkara Motorway Project**

| Kilometres | Interchange List |
|---|---|
| 1+184 | Silivri Prison Interchange |
| 2+364 | Kınalı Interchange |
| 12+967 | Çanta Interchange |
| 21+660 | Marmara Ereğlisi Interchange |
| 26+350 | Çorlu Airport Interchange |
| 39+810 | Karatepe Interchange |
| 54+130 | Tekirdağ East Interchange |
| 60+472 | Tekirdağ Interchange |
| 67+427 | Hayrabolu Interchange |
| 74+290 | Tekirdağ West Interchange |

### 3.3.3 Motorway Service Facility

Four motorway service facilities will be constructed for the Project. The kilometer details of the service facilities are presented in the table below. The location map of the service facilities is presented in Figure 11.

**Table 8: Motorway Service Facilities**

| Name | Kilometer |
|---|---|
| MSF1 | 16+000 |
| MSF2 | 45+500 |
| MSF3 | 83+750 |

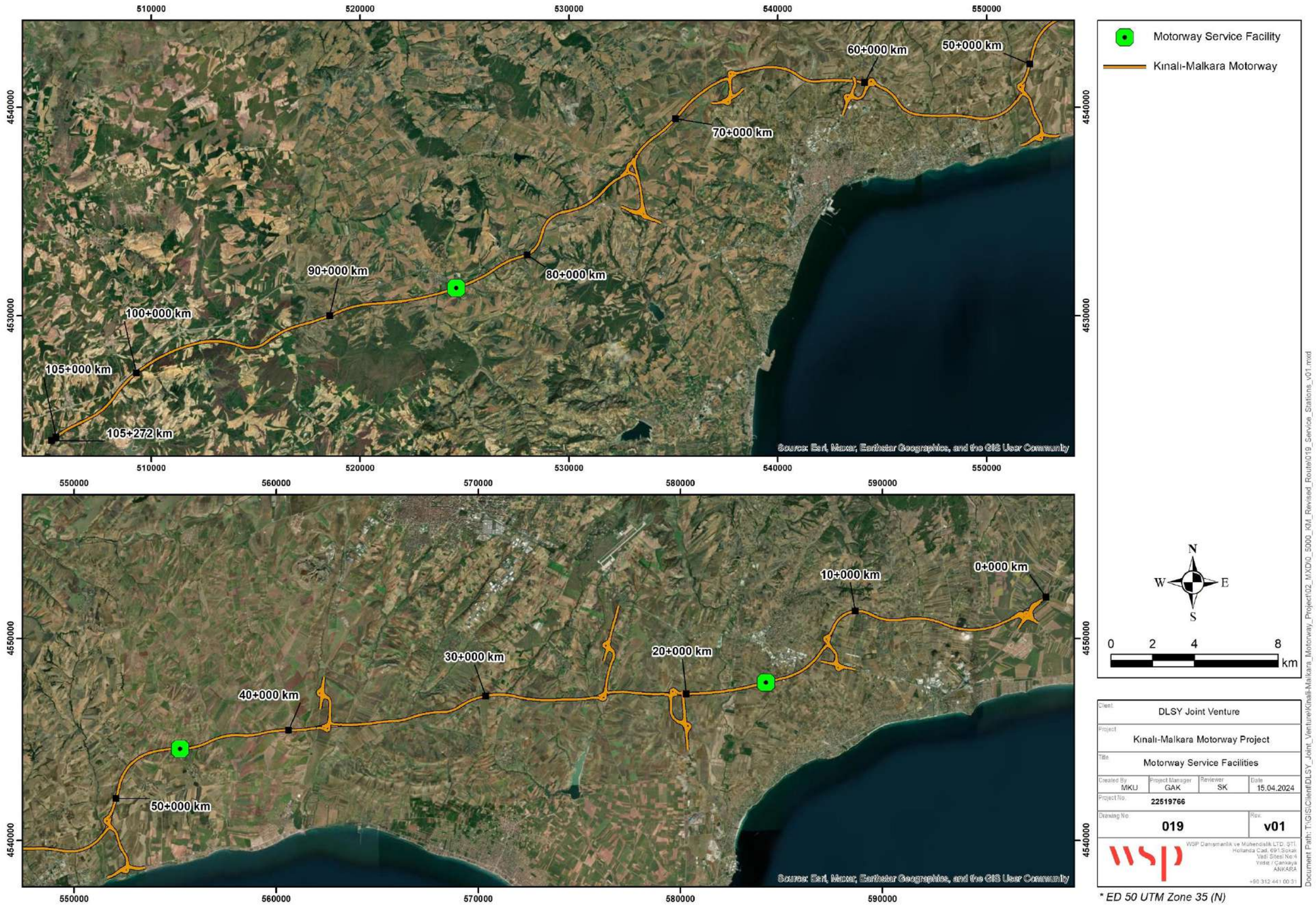



**Figure 11: Motorway Service Facilities**

### 3.3.4 Energy Transmission Line and Substations

At this stage of the Project, there is no definitive information regarding the energy transmission lines (ETL) and substations that will be constructed and operated. Based on the Client's experience with the Malkara-Çanakkale Section, the following assumptions have been made:

- The campsites and related facilities will be situated where an existing energy distribution system is already in place, thus negating the need for constructing new ETLs for the Project.
- The Client will make the necessary applications to the energy service provider(s) prior to the commencement of the construction phase.
- It is anticipated that all service areas will be equipped with new substations to accommodate the needs of operation phase food and beverage tenants, petroleum stations, and e-charge stations.

In accordance with these assumptions, the Client is obliged to update the Lenders' Environmental and Social Advisor as more specific information becomes available.

### 3.3.5 Associated Facilities

Associated facilities, that are as a part of the Project are considered as the Project components. These facilities' construction and operation are also considered in the context of the ESIA studies. Among others, the main Project facilities to be considered in the ESIA are the followings:

- Temporary associated facilities (which will be used only during construction of the Project)
  - Quarries and borrow pits;
  - Camp sites and storage areas;
  - Crushers, concrete batching plants and asphalt plants; and
  - Access roads

#### *3.3.5.1 Quarries and Borrow Pits*

There will be various borrow pits and quarries, that have been identified by the ÇOK A.Ş. along the Project route, to be used in the construction phase of the Project (Table 9). Detailed information on Quarries and Borrow Pits is given in Table 10.

**Table 9: Quarries and Borrow Pits**

| Description | Amount |
|---|---|
| Borrow Pits | 5 |
| Quarries | 6 |

**Table 10: Detailed information of Quarries and Borrow Pits**

| Facility Name | Province | District | Neighbourhood | Km | Distance from the Route (km) | App. Area ($m^2$) | Capacity (ton) | Status (Existing/New) | Operated by Client |
|---|---|---|---|---|---|---|---|---|---|
| **Borrow Pits** | | | | | | | | | |
| Borrow Pit-1 (Çanta) | İstanbul | Silivri | Çanta | 5+250 | 9.50 | 19.88 | 6,000,000 | New | Yes |
| Borrow Pit-2 (Türkgücü) | Tekirdağ | Çorlu | Türkgücü | 30+320 | 1.85 | 29.88 | 7,500,000 | New | Yes |
| Borrow Pit-3 (İnecik Kuzey) | Tekirdağ | S.Paşa | İnecik | 85+100 | 4.30 | 19.98 | 6,000,000 | New | Yes |
| Borrow Pit-4 (İnecik Güney) | Tekirdağ | S.Paşa | İnecik | 85+100 | 1.80 | 19.87 | 6,000,000 | New | Yes |
| Borrow Pit-5 (Mahramlar) | Tekirdağ | S.Paşa | Mahramlı | 91+390 | 1.00 | 29.72 | 7,500,000 | New | Yes |
| **Quarries** | | | | | | | | | |
| Danamandıra Limestone Quarry | İstanbul | Silivri | Danamandıra | 5+250 | 36.00 | 62.05 | 9,000,000 | Yes | Yes |
| Muratlı Basalt Quarry | Tekirdağ | Muratlı | Muradiye | 60+500 | 16.50 | 7.00 | 1,500,000 | Yes | Yes |
| 68+000 Basalt Quarry* | Tekirdağ | S.Paşa | Yağcı | 68+000 | 1.10 | TBD | TBD | - | - |
| Osmanlı Basalt Quarry | Tekirdağ | S.Paşa | Osmanlı | 68+000 | 4.40 | 14.51 | 4,000,000 | Yes | Yes |
| Tepeköy Limestone Quarry | Tekirdağ | Malkara | Tepeköy | 83+500 | 61.30 | 24.86 | 4,000,000 | Existing - capacity increase | No |
| Dereköy Basalt / Limestone Quarry | Tekirdağ | Malkara | Dereköy | 96+740 | 1.00 | 20.30 | TBD | Existing – capacity increase | No |

*TBD based on capacity assessment.

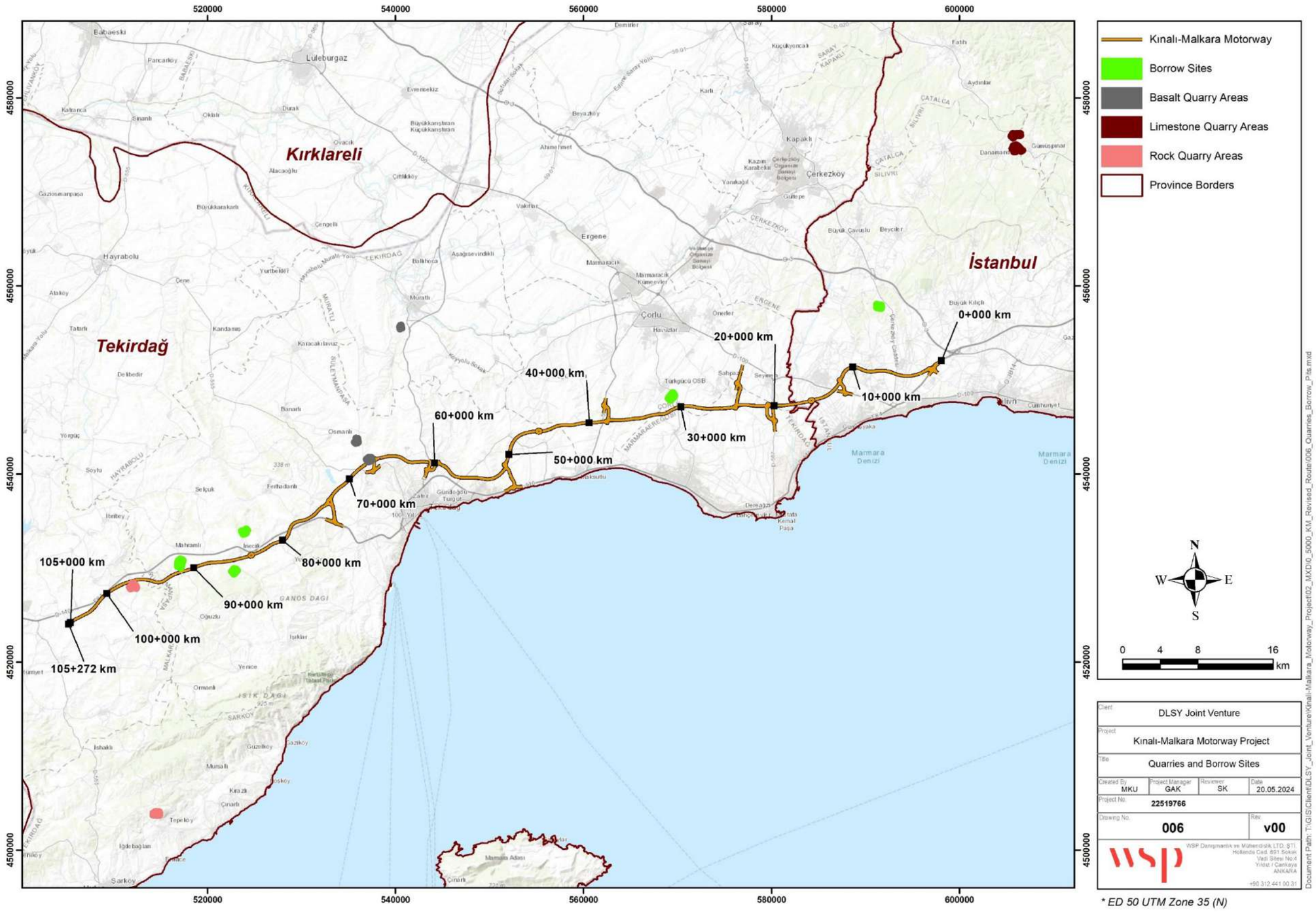



**Figure 12: Quarries and Borrow Pits**

### 3.3.5.2 Camp Sites, Storage Areas, Sub-construction Site

In the context of the Project's construction activities, there will be one campsite and 15 storage areas of which currently planned locations and layouts can be seen in the following table and figure. The total number of workers which will be stay in the camp is not certain yet. There will be no accommodation in sub-construction sites. These sites will be used by the workers for lunch and there will be offices for HSE department.

The numbers of campsites, sub-construction sites, and storage sites for the Project are listed in Table 11. Details about these sites, to the extent they are currently available, are provided Table 12.

**Table 11: Campsite, Sub-construction Sites, and Storage Areas**

| Description | Amount |
|---|---|
| Camp (office and accommodation) | 1 |
| Sub-construction sites | 2 |
| Storage Areas | 15 |

**Table 12: Detailed information of Camp Sites, Storage Areas, Sub-construction Site**

| Facility Name | Province | District | Neighbourhood | Km | Distance from the Route (km) | App. Area (ha) | Capacity ($m^3$) | Status (Existing/New) | Operated by Client |
|---|---|---|---|---|---|---|---|---|---|
| **Camp Site** | | | | | | | | | |
| Camp Site-1 | Tekirdağ | Süleymanpaşa | Gazioğlu | 48+500 | 1.80 | 30.7 | Work in progress | New | Yes |
| **Sub-construction site** | | | | | | | | | |
| Sub-construction Site-1 | İstanbul | Silivri | Fevzipaşa | 16+000 | 2.30 | 13.3 | Work in progress | New | Yes |
| Sub-construction Site-2 | Tekirdağ | Süleymanpaşa | İnecik | 83+500 | 0.00 | 12.50 | Work in progress | New | Yes |
| **Storage Area** | | | | | | | | | |
| Storage Area-1 | İstanbul | Silivri | Çeltik | 2+500 | 2.75 | 30.0 | Work in progress | New | Yes |
| Storage Area-2 | İstanbul | Silivri | Çanta | 5+250 | 9.50 | 39.2 | Work in progress | Existing quarry operated by KGM | Yes |
| Storage Area-3 | İstanbul | Silivri | Gümüşyaka | 17+540 | 3.10 | 33.4 | Work in progress | New | Yes |
| Storage Area-4 | Tekirdağ | Çorlu | Seymen | 20+170 | 4.62 | 31.5 | Work in progress | New | Yes |
| Storage Area-5 | Tekirdağ | Marmaraereğlisi | Türkmenli | 26+900 | 2.86 | 48.5 | Work in progress | New | Yes |
| Storage Area-6 | Tekirdağ | Çorlu | Türkgücü | 30+320 | 1.85 | 28.0 | Work in progress | To be used as borrow pit after completion of quarry usage | Yes |
| Storage Area-7 | Tekirdağ | Süleymanpaşa | Husunlu | 47+510 | 3.00 | 35.0 | Work in progress | New | Yes |
| Storage Area-8 | Tekirdağ | Süleymanpaşa | Köseilyas | 53+400 | 1.95 | 40.0 | Work in progress | New | Yes |
| Storage Area-9 | Tekirdağ | Süleymanpaşa | Kayı | 60+470 | 2.65 | 29.9 | Work in progress | New | Yes |
| Storage Area-10 | Tekirdağ | Süleymanpaşa | Yağcı | 68+390 | 2.15 | 40.0 | Work in progress | New | Yes |
| Storage Area-11 | Tekirdağ | Süleymanpaşa | Seymenli | 73+000 | 0.00 | 40.0 | Work in progress | New | Yes |
| Storage Area-12 | Tekirdağ | Süleymanpaşa | Seymenli | 75+830 | 2.00 | 13.5 | Work in progress | New | Yes |
| Storage Area-13 | Tekirdağ | Süleymanpaşa | Nusratfakı | 80+500 | 1.85 | 30.0 | Work in progress | New | Yes |
| Storage Area-14 | Tekirdağ | Süleymanpaşa | İnecik | 85+100 | 0.64 | 17.5 | Work in progress | New | Yes |
| Storage Area-15 | Tekirdağ | Süleymanpaşa | Kınıklar | 93+820 | 0.70 | 40.0 | Work in progress | New | Yes |

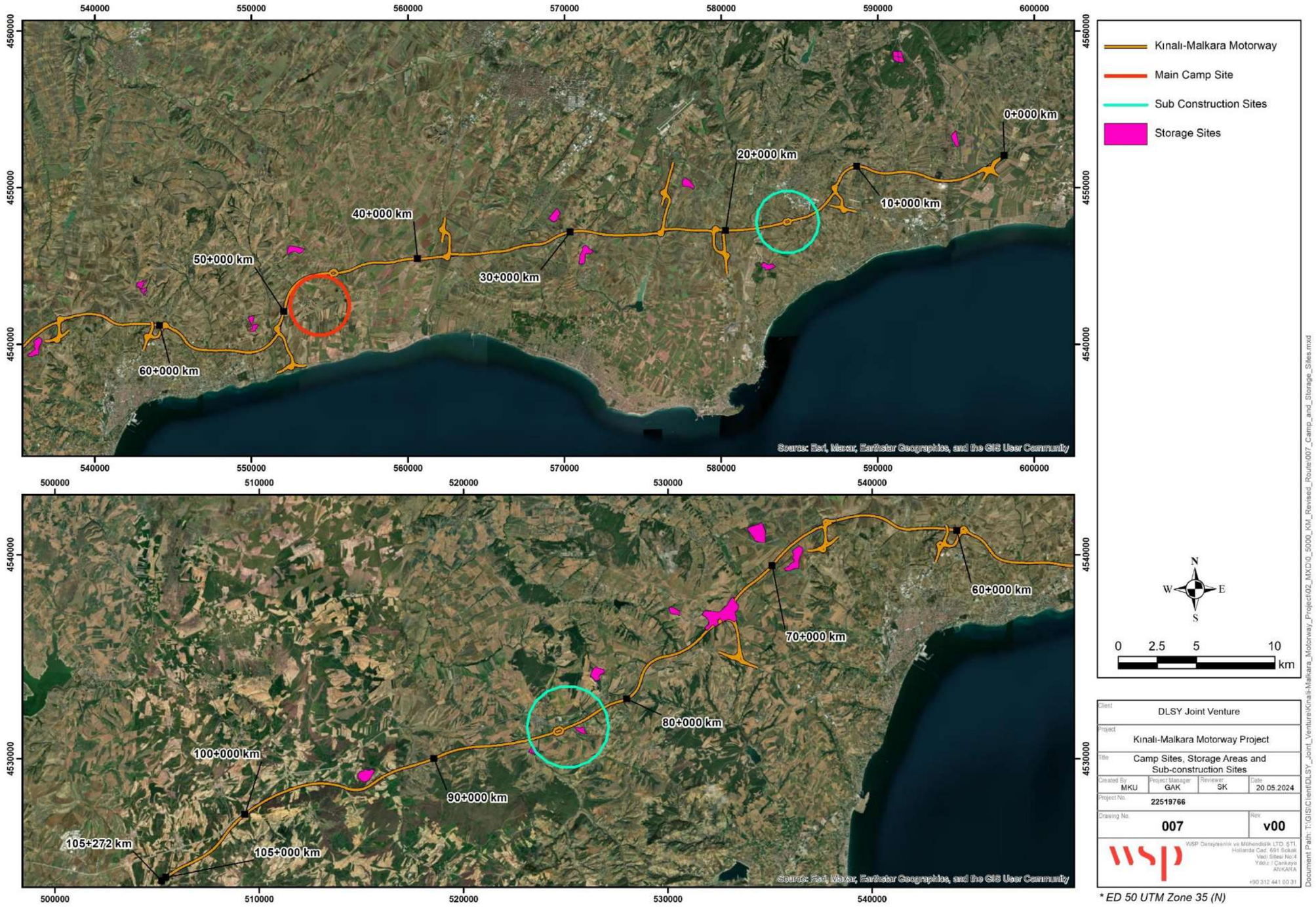



**Figure 13: Camp Site, Sub-construction Sites and Storage Areas**

### 3.3.5.3 Concrete Batching and Asphalt Plants

Proposed concrete batching and asphalt plants, that have been identified by ÇOK A.Ş. along the Project route, to be used in the construction phase of the Project are presented in Table 13 and Figure 14 below.

**Table 13: Concrete and Asphalt Plants**

| Description | Amount |
|---|---|
| Concrete Batching Plants | 3 |
| Asphalt Plants | 2 |
| Mechanical Plant | 2 |
| Precast Plant | 2 |

**Table 14: Number of Concrete Batching and Asphalt Plants**

| Facility Name | Province | District | Neighbourhood | Km | App. Area ($m^2$) | Capacity | Status (Existing /New) | Operated by Client |
|---|---|---|---|---|---|---|---|---|
| **Concrete Batching Plant** | | | | | | | | |
| Concrete Batching Plant-1 | İstanbul | Silivri | Fevzipaşa | 16+000 | To be located within campsite | 90 $m^3$/h | New | Yes |
| Concrete Batching Plant-2 | Tekirdağ | Süleymanpaşa | Gazioğlu | 48+500 | To be located within campsite | 110 $m^3$/h | New | Yes |
| Concrete Batching Plant-3 | Tekirdağ | Süleymanpaşa | İnecik | 83+500 | To be located within campsite | 100 $m^3$/h | New | Yes |
| **Asphalt Plant** | | | | | | | | |
| Asphalt Plant-1 | İstanbul | Silivri | Fevzipaşa | 16+000 | To be located within campsite | 340 ton/h hot mix 450 ton/h cold mix | New | Yes |
| Asphalt Plant-2 | Tekirdağ | Süleymanpaşa | İnecik | 83+500 | To be located within campsite | 340 ton/h hot mix 450 ton/h cold mix | New | Yes |
| **Mechanical Plant** | | | | | | | | |
| Mechanical Plant-1 | İstanbul | Silivri | Fevzipaşa | 16+000 | To be located within campsite | TBD | New | Yes |
| Mechanical Plant-2 | Tekirdağ | Süleymanpaşa | İnecik | 83+500 | To be located within campsite | TBD | New | Yes |

| Facility Name | Province | District | Neighbourhood | Km | App. Area ($m^2$) | Capacity | Status (Existing /New) | Operated by Client |
|---|---|---|---|---|---|---|---|---|
| **Precast Plant** | | | | | | | | |
| Precast Plant-1 | İstanbul | Silivri | Fevzipaşa | 16+000 | To be located within campsite | 4 girders / day | New | Yes |
| Precast Plant-2 | Tekirdağ | Süleymanpaşa | İnecik | 83+500 | To be located within campsite | 4 girders / day | New | Yes |

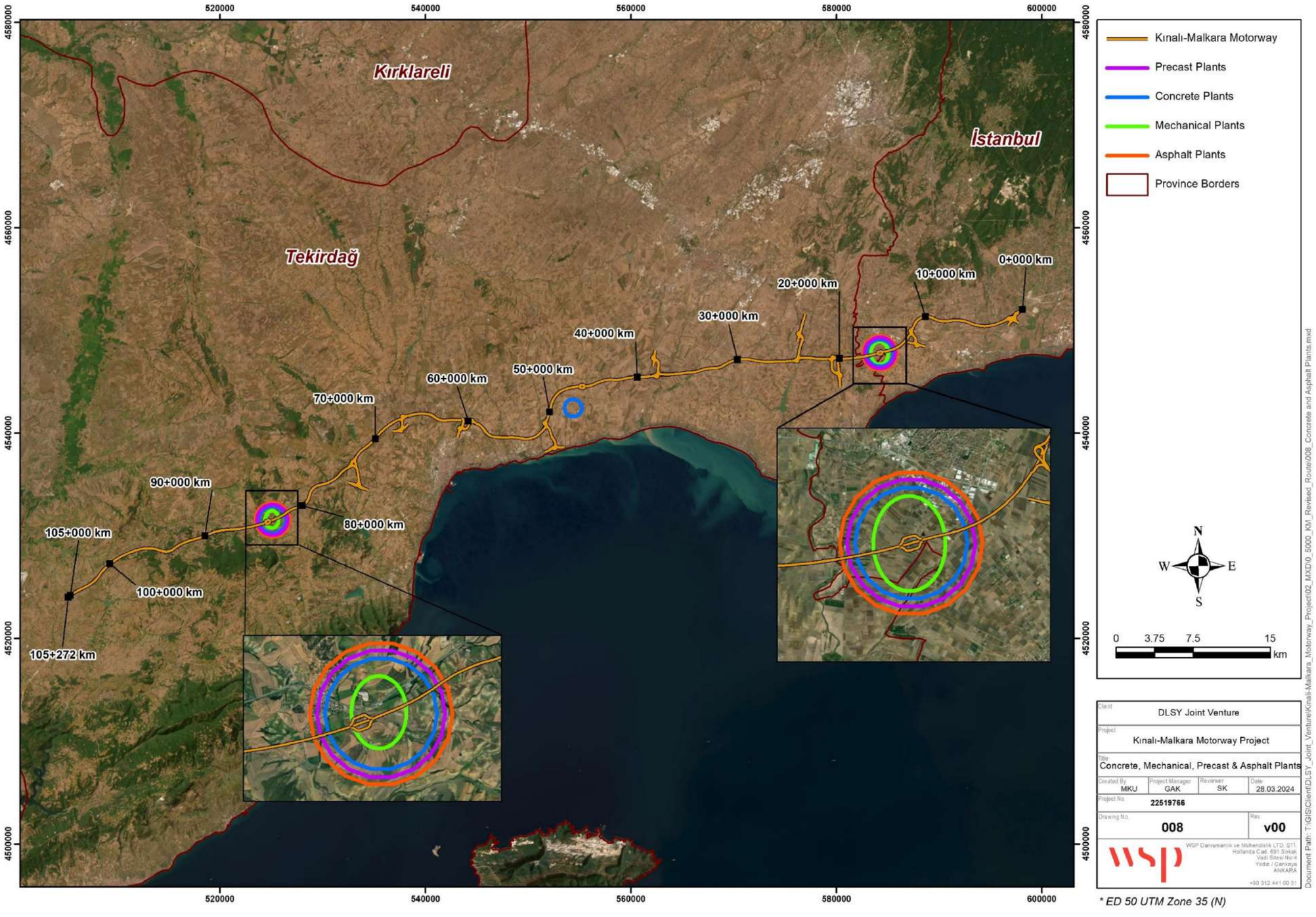



**Figure 14: Concrete and Asphalt Plants**

#### 3.3.5.4 Access Roads

During the construction, to reach the motorway alignment locations from existing local/national roads, access roads will be required. Some of the access roads to be used within the scope of the Project, are already exist. However, at this stage of the Project, the access roads to be used to provide transportation to all Project associated facilities and components are not certain yet. In case a need, some improvements and extensions will be carried out on existing roads.

The locations and layout of these temporary access roads will be developed in consultation with the local authorities. The length of the temporary access roads is not known yet. In case a need, improvements will be made on existing roads.

## 3.4 Third Party Utilities

In linear development projects such as Kınalı-Malkara Motorway, the route often passes through third-party utilities that are either already built or are planned to be. These third-party utilities could be bridges, railroads, dams, pipelines, telephone cables, overhead power lines, etc. The proposed gas pipeline, powerline, road, and railroad crossings are listed in the tables below.

**Table 15: River/Water Crossings**

| Name | Km |
|---|---|
| Kula River | 1+875 |
| Tatlı River | 3+576 |
| Çanta River | 6+487 |
| Ephemeral Stream | 7+484 |
| Ephemeral Stream | 9+396 |
| Ephemeral Stream | 9+593 |
| Ephemeral Stream | 10+264 |
| Ephemeral Stream | 11+387 |
| Ephemeral Stream | 11+387 |
| Kumlubağ River | 17+818 |
| Intermittent Stream | 20+980 |
| Intermittent Stream | 21+148 |
| Ephemeral Stream | 22+909 |
| Intermittent Stream | 23+826 |
| Anaç River | 24+875 |
| Ephemeral Stream | 25+504 |
| Ephemeral Stream | 26+210 |
| Ephemeral Stream | 27+207 |
| Ephemeral Stream | 28+116 |
| Intermittent Stream | 29+039 |
| Intermittent Stream | 34+095 |
| Köprüce River | 34+625 |

| Name | Km |
|---|---|
| Ephemeral Stream | 34+796 |
| Ephemeral Stream | 34+893 |
| Ephemeral Stream | 35+387 |
| Intermittent Stream | 37+019 |
| Intermittent Stream | 39+159 |
| Ephemeral Stream | 39+902 |
| Ephemeral Stream | 41+471 |
| Ephemeral Stream | 42+048 |
| Ephemeral Stream | 42+780 |
| Seymen River | 43+330 |
| Ephemeral Stream | 44+258 |
| Ephemeral Stream | 45+139 |
| Ephemeral Stream | 45+951 |
| Ephemeral Stream | 46+726 |
| Intermittent Stream | 49+225 |
| Intermittent Stream | 50+404 |
| Intermittent Stream | 52+052 |
| Intermittent Stream | 53+541 |
| Intermittent Stream | 56+068 |
| Intermittent Stream | 58+820 |
| Intermittent Stream | 60+698 |
| Intermittent Stream | 61+323 |
| Intermittent Stream | 61+462 |
| Ephemeral Stream | 62+094 |
| Ephemeral Stream | 62+863 |
| Ephemeral Stream | 64+023 |
| Intermittent Stream | 64+445 |
| Intermittent Stream | 64+907 |
| Intermittent Stream | 65+152 |
| Intermittent Stream | 65+380 |
| Intermittent Stream | 66+828 |
| Ephemeral Stream | 67+711 |
| Ephemeral Stream | 68+264 |
| Ephemeral Stream | 68+581 |
| Ephemeral Stream | 69+699 |

| Name | Km |
|---|---|
| Tekke River | 71+459 |
| Ephemeral Stream | 72+719 |
| Ephemeral Stream | 72+893 |
| Ephemeral Stream | 72+969 |
| Ephemeral Stream | 73+538 |
| Ephemeral Stream | 73+584 |
| Ephemeral Stream | 74+034 |
| Ephemeral Stream | 74+458 |
| Ephemeral Stream | 74+725 |
| Ephemeral Stream | 75+160 |
| Ephemeral Stream | 75+611 |
| Ephemeral Stream | 76+413 |
| Intermittent Stream | 77+159 |
| Intermittent Stream | 77+898 |
| Ephemeral Stream | 79+630 |
| Ephemeral Stream | 80+030 |
| Intermittent Stream | 80+225 |
| Ephemeral Stream | 81+294 |
| Ephemeral Stream | 81+874 |
| Ephemeral Stream | 82+346 |
| Ephemeral Stream | 83+370 |
| Ephemeral Stream | 84+042 |
| Sarıyer River | 84+701 |
| Ephemeral Stream | 87+151 |
| Intermittent Stream | 88+086 |
| Intermittent Stream | 88+993 |
| Ephemeral Stream | 89+239 |
| Intermittent Stream | 90+883 |
| Köprübaşı River | 91+585 |
| Intermittent Stream | 91+854 |
| Intermittent Stream | 92+137 |
| Intermittent Stream | 92+225 |
| Ephemeral Stream | 92+536 |
| Intermittent Stream | 92+711 |
| Intermittent Stream | 94+037 |

| Name | Km |
|---|---|
| Intermittent Stream | 94+259 |
| Intermittent Stream | 94+483 |
| Intermittent Stream | 95+151 |
| Ephemeral Stream | 95+255 |
| Intermittent Stream | 96+014 |
| Intermittent Stream | 96+177 |
| Ephemeral Stream | 96+474 |
| Intermittent Stream | 97+006 |
| Intermittent Stream | 97+881 |
| Intermittent Stream | 98+197 |
| Intermittent Stream | 100+727 |
| Ephemeral Stream | 102+275 |
| Intermittent Stream | 104+466 |
| Çayırlar River | 105+143 |

**Table 16: Road Crossing**

| Name | Km | Type of Crossing |
|---|---|---|
| No name road (Çeltik field road) | 1+399 | Underpass |
| No name road (Çeltik field road) | 2+511 | Underpass |
| No name road (Çeltik field road) | 3+629 | Underpass |
| No name road (Çeltik field road) | 3+978 | Underpass |
| Devlet Street (Çeltik) | 4+330 | Overpass |
| No name road (Çeltik field road) | 4+995 | Road diversion |
| Çetik Road-1 | 5+221 | Overpass |
| No name road (Çeltik field road) | 5+520 | Road diversion |
| No name road (Çantaköy field road) | 6+649 | Underpass |
| No name road (Çantaköy field road) | 6+810 | Road diversion |
| No name road (Çantaköy field road) | 6+810-7+240 | Road diversion |
| Old Çantaköy – New Çantaköy Road | 7+975 | Overpass |
| No name road (Çantaköy field road) | 8+601 | Overpass |
| No name road (Çantaköy field road) | 8+601-9+020 | Road diversion |
| No name road (Çantaköy field road) | 10+372 | Overpass |
| Karapınar Road | 11+102 | Overpass |
| İstanbul - Çorlu Road (D100) | 13+290 | Underpass |
| Gümüşyaka – Değirmenköy Road | 14+059 | Overpass |

| Name | Km | Type of Crossing |
|---|---|---|
| No name road (Fevzipaşa field road) | 14+610 | Road diversion |
| No name road (Fevzipaşa field road) | 15+600 | Road diversion |
| No name road (Fevzipaşa field road) | 15+850 | Road diversion |
| No name road (Fevzipaşa field road) | 16+320 | Road diversion |
| No name road (Fevzipaşa field road) | 16+807 | Box culvert |
| Hakimbey Street | 17+300 | Road diversion |
| No name road (Fevzipaşa field road) | 17+533 | Underpass |
| No name road (Fevzipaşa field road) | 18+090 | Road diversion |
| No name road (Fevzipaşa field road) | 18+170 | Road diversion |
| Edirne – Marmara Ereğlisi Road (D567) | 20+171 | Overpass |
| No name road (Yakuplu field road) | 23+496 | Overpass |
| Süleyman Aktuyun Street | 24+278 | Overpass |
| No name road (Yakuplu field road) | 24+630 | Road diversion |
| No name road (Yakuplu field road) | 26+700 | Road diversion |
| Türkmenli – Şahpaz Road | 26+875 | Overpass |
| No name road (Çeşmeli field road) | 29+700 | Road diversion |
| Çeşmeli – Türkgücü Road | 30+322 | Overpass |
| No name road (Çeşmeli field road) | 30+620 | Road diversion |
| No name road (Çeşmeli field road) | 31+834 | Underpass |
| No name road (Türkgücü field road) | 33+180 – 33+320 | Road diversion |
| No name road (Türkgücü field road) | 36+080 | Road diversion |
| No name road (Türkgücü field road) | 37+840 | Road diversion |
| Ali Osman Çelebi Boulevard | 38+543 | Underpass |
| No name road (Yenice field road) | 39+486 | Underpass |
| No name road (Yenice field road) | 40+100 | Road diversion |
| No name road (Yenice field road) | 40+880 | Road diversion |
| No name road (Yenice field road) | 41+050 | Road diversion |
| No name road (Maksutlu field road) | 42+780 | Road diversion |
| Karaevli – Maksutlu Road | 44+646 | Underpass |
| No name road (Husunlu field road) | 46+935 | Overpass |
| No name road (Husunlu field road) | 47+580 | Road diversion |
| Gazioğlu – Husunlu Road | 48+347 | Underpass |
| No name road (Gazioğlu field road) | 49+690 | Road diversion |
| No name road (Gazioğlu field road) | 51+935 | Underpass |
| No name road (Köseilyas field road) | 52+540 | Underpass |

| Name | Km | Type of Crossing |
|---|---|---|
| No name road (Köseilyas field road) | 53+120 | Road diversion |
| No name road (Köseilyas field road) | 53+370 | Road diversion |
| No name road (Köseilyas field road) | 53+580 | Road diversion |
| No name road (Köseilyas field road) | 53+950 | Road diversion |
| No name road (Köseilyas field road) | 54+520 | Road diversion |
| Üniversite Street | 55+082 | Underpass |
| Kayı Village Road | 56+300 | Road diversion |
| Köseilyas Village Road | 56+300 | Road diversion |
| Kayı Village Road | 58+100 | Road diversion |
| No name road (Kayı field road) | 58+320 | Underpass |
| No name road (Kayı field road) | 59+570 | Road diversion |
| No name road (Kayı field road) | 59+690 | Road diversion |
| Tekirdağ – Lüleburgaz Road (D565) | 60+473 | Overpass |
| No name road (Kayı field road) | 61+507 | Underpass |
| No name road (D565-D555 field road) | 63+420 | Overpass |
| No name road (Osmanlı field road) | 65+781 | Overpass |
| No name road (Osmanlı field road) | 67+974 | Overpass |
| Edirne – Tekirdağ Road (D555) | 68+392 | Overpass |
| No name road (Yağcı field road) | 70+593 | Overpass |
| No name road (Yağcı field road) | 71+804 | Underpass |
| No name road (D110-Seymenli connection) | 75+834 | Overpass |
| No name road (D110-Güvençli connection) | 77+424 | Overpass |
| No name road (Güvençli field road) | 77+600 | Road diversion |
| No name road (Güvençli field road) | 77+750 | Road diversion |
| Tekirdağ – İpsala Road (D110) | 78+654 | Underpass |
| D110-Yukarıkılıçlı Connection | 78+952 | Underpass |
| Nusratfakı Village Road | 80+472 | Overpass |
| No name road (İnecik field road) | 82+929 | Underpass |
| No name road (İnecik field road) | 83+770 | Road diversion |
| No name road (İnecik field road) | 84+088 | Road diversion |
| İnecik Road | 85+125 | Underpass |
| No name road (İnecik field road) | 85+700 | Road diversion |
| No name road (İnecik field road) | 86+500 | Road diversion |
| No name road (İnecik field road) | 86+826 | Overpass |
| No name road (İnecik forest road) | 88+715 | Overpass |

| Name | Km | Type of Crossing |
|---|---|---|
| No name road (Akçahalil field road) | 90+351 | Underpass |
| D110-Akçahalil Connection | 91+391 | Underpass |
| No name road (Kınıklar field road) | 92+443 | Overpass |
| No name road (Kınıklar field road) | 93+700 | Road diversion |
| No name road (Kınıklar field road) | 94+600 | Road diversion |
| No name road (Kınıklar field road) | 94+851 | Overpass |
| D110 – Yenice Connection | 96+745 | Underpass |
| No name road (Yenice field road) | 97+680 | Road diversion |
| No name road (Yenice field road) | 98+130 | Road diversion |
| D110 – Vakıfiğdemir Connection | 99+494 | Overpass |
| No name road (Ahievren field road) | 101+090 | Road diversion |
| No name road (Ahievren field road) | 101+600 | Road diversion |
| No name road (Ahievren field road) | 103+835 | Underpass |
| No name road (Ahievren field road) | 104+802 | Overpass |

**Table 17: Railway Crossings**

| Definition | Km |
|---|---|
| Tekirdağ – Muratlı Railway | 62+792 |

**Table 18: Powerline Crossings**

| Name | Km |
|---|---|
| ETL | 13+679 |
| ETL | 18+918 |
| ETL | 18+968 |
| ETL | 26+040 |
| ETL | 33+644 |
| ETL | 33+983 |
| ETL | 36+421 |
| ETL | 36+465 |
| ETL | 43+753 |
| GAZI-1 Tekirdag Main Collection Line | 51+374 |
| ETL | 51+601 |
| ETL | 56+955 |
| GAZI-1 Tekirdag Main Collection Line | 57+531 |
| ETL | 65+759 |

| Name | Km |
|---|---|
| ETL | 65+933 |
| ETL | 66+188 |
| ETL | 77+975 |

**Table 19: Gas/Petroleum Pipeline Crossings**

| Name | Km |
|---|---|
| TPAO Pipeline | 7+987 |
| TPAO Pipeline | 8+105 |
| BOTAS NATO Pipeline | 13+203 |
| TPAO Pipeline | 13+255 |
| ACD LNG Pipeline | 18+558 |
| CORDAS Natural Gas Pipeline | 24+213 |
| BOTAS NATO Pipeline | 25+495 |
| BOTAS NATO Pipeline | 48+614 |
| TBNGC Natural Gas Pipeline | 50+325 |
| TBNGC Natural Gas Pipeline | 53+344 |
| TBNGC Natural Gas Pipeline | 59+399 |
| TBNGC Natural Gas Pipeline | 61+782 |
| BOTAS NATO Pipeline | 62+128 |
| GAZDAS Natural Gas Pipeline | 62+845 |
| TBNGC Natural Gas Pipeline | 65+177 |
| TBNGC Natural Gas Pipeline | 66+770 |
| TBNGC Natural Gas Pipeline | 71+506 |
| BOTAS NATO Pipeline | 78+591 |
| BOTAS NATO Pipeline | 81+392 |
| BOTAS NATO Pipeline | 91+467 |

**Table 20: Water Transmission Line Crossings***

| Name / Type / Dimension of Line | Km |
|---|---|
| 1000 Steel Pipe | 1+401 |
| 600ACB | 1+614 |
| 1000DF | 3+979 |
| 1000DF | 4+326 |
| 1000DF | 4+984 |
| 1000DF | 8+106 |

| Name / Type / Dimension of Line | Km |
|---|---|
| 250DF | 11+097 |
| 400 Steel | 14+063 |
| 400 Steel | 14+065 |

*Water transmission lines in Tekirdağ is requested from the municipality by KGM. No response is received as of the reporting date.

## 3.5 Project Phases

### 3.5.1 Project Construction Activities

Construction works will start with clearing the terrain in the area defined by the Project design boundaries. These works cover the removal of vegetation and structures in the area. The following activities involve earthworks (cut and fill sections' excavation and embankment activities) for which graders, dozers, concrete skippers, rollers, and other similar machinery will be used. This is followed by the construction of culverts and drainage systems as well as the construction of larger structures. With completion of these works, finishing works, and pavement of the constructed road begin such as Cold-mix Layer, Bituminous Base Coarse, Binder Coarse and Wearing Coarse. The final steps are the installation of ancillary equipment (fencing, lighting, road markings etc.) and the preparation of the road belt (landscaping).

There are already access roads on the Project routes. However, some extension works might be performed in case of need.

During the construction phase, number of personnel expected to be employed are 3,300. List of equipment and vehicles to be used during the construction phase is given in

**Table 21: Number of Machine and Equipment**

| No | Machine Type | Subtotal |
|---|---|---|
| 1 | Grader | 20 |
| 2 | Roller | 100 |
| 3 | Trucks | 622 |
| 4 | Loader | 42 |
| 5 | Excavator | 103 |
| 6 | JCB | 15 |
| 7 | Water Truck | 30 |
| 8 | Dozer | 29 |
| 9 | Truck Mounted Crane (Hi-up) | 46 |
| 10 | Mobile Crane | 19 |
| 11 | Portal Crane | 2 |
| 12 | Concrete Pump | 10 |
| 13 | Concrete Mixer | 45 |
| 14 | Fuel Truck | 13 |
| 15 | Boring Machine | 6 |

| No | Machine Type | Subtotal |
|---|---|---|
| 16 | Finisher | 22 |
| 17 | Asphalt Rollers | 30 |
| 18 | Rock Drilling Machine | 8 |
| 19 | Asphalt Distributor | 3 |
| 20 | Shuttle Buggy | 2 |
| 21 | Power Curber | 1 |
| **TOTAL** | | **1.168** |

#### *3.5.1.1 Emission and Water Use*

##### 3.5.1.1.1 Emission

During construction phase of the Project, emissions may result from but not limited to:

- outdoor machinery,
- road construction,
- construction vehicle and equipment,
- transportation,
- emissions caused by construction facilities (i.e., borrow pits, quarries, crushers, asphalt plants and batch plants).

Exhaust gas emissions will occur due to the diesel engines that will be used for electricity generation and construction equipment that will be operated during the land preparation and construction activities.

During construction and decommissioning activities, noise and vibration may be caused by earth moving and excavation equipment, concrete mixers, cranes and the transportation of equipment, materials, and people.

##### 3.5.1.1.2 Water Use

The water supply for construction activities is planned to be provided by the city network within the scope of the Project. When the water supply from the city network is not sufficient or the water supply from the city network cannot be provided throughout the Project route, water will be transported to site and will be stored in the water tanks.

Currently, there are no plans to drill groundwater wells for the Project. However, if connection to the municipal water supply proves infeasible and transporting water is not economically viable, groundwater wells may be drilled, provided that the necessary permits are obtained.

During the construction phase of the Project, maximum 3,300 workers will be employed. According to Regulation on Water Intended for Human Consumption the daily water consumption amount is estimated as 200 L/day, the maximum daily amount of water to be used will be as follows:

*Total number of employees: 3300*

*Maximum amount of water to be used by employees: 3300 people x 200 L/day/person = 660 $m^3$/day*

For the dust emission raising from the construction activities, sprinkler (water truck) will be used. Almost 40 $m^3$/day water is estimated to be used for the dust suppression during the construction phase of the Project.

Drinking water needs of personnel will be supplied by bottled waters.

#### *3.5.1.2 Wastewater and Waste*

##### 3.5.1.2.1 Wastewater

Wastewaters will be generated at the construction sites and camps sites due to water consumption of the personnel. No wastewater generation is expected as a result from dust suppression activities, since the water to be used for dust suppression activities is expected to evaporate.

For domestic wastewater generated by operation of the associated facilities, the preferred approach is to collect the wastewater in portable, leak-proof septic tanks. These tanks will then be emptied by a licensed contractor and transported to the nearest licensed wastewater treatment facility that meets discharge quality standards. If this approach is not feasible, package wastewater treatment plants (WWTP) with a domestic wastewater collection system will be established. This decision will be made in later stages of the Project.

The approximate wastewater generation during the construction phase is calculated using both the conservative approach, assuming all the water consumption will be converted to wastewater, and using the wastewater to water ratio derived from the TURKSTAT Municipality Water and Wastewater Statistics. The calculations are as follows:

**Conservative Approach:**

*Maximum amount of water to be used by employees: 660 $m^3$/day*

*Water/Wastewater Ratio: 1*

*Wastewater generation amount by employees = 660 $m^3$/day*

**Approach Using Statistical Data:**

*Maximum amount of water to be used by employees: 660 $m^3$/day*

*Water/Wastewater Ratio: 0.65*[2]

*Wastewater generation amount by employees = 429 $m^3$/day*

The wastewater will be treated in accordance with the Project Standards defined in APPENDIX A. The treated wastewaters then will be discharged where related PDoEUCC deems appropriate.

No wastewater generation is expected during the concrete production process as the settled wastewater is recirculated to concrete production process.

##### 3.5.1.2.2 Wastes

**Domestic Solid Waste**

During the construction of the Project, domestic solid waste generation is expected from the daily activities of personnel. During the construction phase, maximum number of employees planned to be employed are 3,300 workers. Assuming that average daily domestic solid waste per capita is 1.15 kg/person/day (average of 1.16

[2] Turkish Statistical Institute, 2001-2022 Tekirdağ Municipality Water and Wastewater Statistics

kg/person/day for Tekirdağ and 1.13 kg/person/day for İstanbul)[3], the amount of daily expected solid waste production during construction phase will be as follows:

*Total number of people: 3,300*

*Maximum amount of solid waste generation (construction) = 3,300 people x 1.15 kg/person/day = 3.80 ton/day*

The amount of waste likely to be generated during the land preparation and construction phase of the Project has been calculated based on the National Waste Management and Action Plan (2016-2023)[4] and the waste characterization data determined by region in the related plan.

**Table 22: The Amount and Type of Waste Expected* for Land Preparation and Construction Phase**

| Type of Waste | Percentage (%) | Calculated amount (kg/day) |
|---|---|---|
| Biowaste | 53.63 | 2,124 |
| Paper-Cardboard | 9.13 | 362 |
| Plastic | 5.45 | 216 |
| Glass | 3.54 | 140 |
| Metal | 1.18 | 47 |
| Flammable | 23.29 | 922 |
| Domestic Hazardous Waste | 0.65 | 26 |
| Other | 3.13 | 124 |
| Total | 100 | 3960 |

*Calculated according to the waste distribution percentages of the Central Anatolia Region

### *Construction Wastes*

Recyclable construction wastes such as woods, cement bags, metal scraps are expected to be generated during the construction phase of the Project. All recyclable construction wastes will be segregated and collected separately on site and will be disposed through the closest Municipality or licensed waste disposal company.

### *Hazardous Wastes*

The hazardous wastes generated during the Project construction phase are consist of many different waste types such as fluorescent tubes, paints/varnishes, waste batteries, end-of-life tires and waste oil, medical waste, and waste vegetable oil. Hazardous wastes may be generated directly from construction activities (chemicals, chemical barrels, concrete mixing operations etc.) or result from oily machine and equipment usage and maintenance operations.

The quantity of the hazardous wastes would be dependent on the activities in the construction sites, and it is not possible to give exact information on the amount of the waste at this stage.

**Waste Batteries and Accumulators:** the maintenance process of the Project can result in generation of waste accumulators and batteries which will be stored in a closed containers with a leak-proof floor and disposed according to the Regulation on Control of Waste Batteries and Accumulators.

[3]Turkish Statistical Institute, 2020 Tekirdağ and İstanbul Municipality Solid Waste Statistics

[4] https://webdosya.csb.gov.tr/db/cygm/haberler/ulusal_at-k_yonet-m--eylem_plan--20180328154824.pdf

**Medical Wastes:** Medical waste generation is expected during the construction phase of the Project due to potential first aid cases. Infirmaries will be established at the construction camp sites. In case of any medical waste generated, they will be collected and disposed separately in accordance with the Regulation on Control of Medical Wastes. Medical Waste Protocol that will be signed with the closest Municipality to the infirmaries.

**Waste oil**: generation can be expected during the maintenance and repair works of the Project. Waste oil will be collected in a closed temporary waste storage area with leak-proof floor and covered with a shelter and managed according to Regulation on Management of Waste Oil.

**Waste Vegetative Oils:** The meals of the workers who will accompany at the camp sites will be prepared in the dining halls, which will result in the waste vegetative oil generation. Vegetable waste oils will be disposed of by licensed recycling facilities in accordance with the provisions of the Regulation on Control of Vegetative Oils.

**Waste Tires:** Waste tires generation is not expected since the maintenance activities of the vehicles and construction machines would be done in authorized services. If there is a need to change the tires of these vehicles and machines in the construction site area, the end-of-life tires that come out would be sent to tire distribution companies or to the authorized transporters. All provisions in the Regulation on the Control of End-of-Life Tires would be followed.

**Waste Electrical and Electronical Goods:** Any waste electrical and electronic good deriving from the Project activities shall be taken to the collection places of the distributors, related municipalities, producers, or processing facilities in accordance with the provisions of the Regulation on Control of Waste Electrical and Electronic Goods.

### 3.5.2 Project Operation Activities

The Project life is 100 years. The concession period of the Project has not yet been determined. A part of the 100-year Project life will be operated by ÇOK A.Ş within the scope of the BOT contract. The operation period will be clarified later in consultation with the MoTI and Undersecretariat of treasury. A maintenance programme will be developed and implemented by ÇOK A.Ş. as per the BOT Contract to assure that specified conditions are met upon the hand-back of the motorway to KGM at the end of the BOT Concession Period.

The average number of workers to be employed is expected to range between 300 and 400 full time equivalents throughout the years, including all contractors during the operation phase. These estimates will be further developed during detailed design and implementation.

#### *3.5.2.1 Emission and Water Use*

##### 3.5.2.1.1 Emission

The main emission source during the operation phase is exhaust emissions of the vehicles along the Motorway Route. In addition, the main sources of the noise and vibration emissions during operation phase of the Motorway will be road traffic which will be cumulated throughout the road axis.

##### 3.5.2.1.2 Water Use

Water demand during the operation phase will be due to the operation of the Motorway and its service facilities. It is foreseen that water demand will be met with city water network if possible. Otherwise, water demand will be provided with water tanks.

During the operation phase it is estimated that maximum 20,000 people including 250 Motorway workers and 19,750 passengers in 2025 and 65,500 people including 250 Motorway workers and 65,250 passengers will use proposed Motorway daily. There will be three Motorway service facilities, and it is estimated that 5,000

people in 2025 and 16,500 people in 2040[5] will use one service facility daily. According to Regulation on Water Intended for Human Consumption, the daily water consumption amount is estimated as 200 L/day. It is assumed that each passenger will spend two hours at the Motorway Service facility. Thus, the total amount of water to be used daily is calculated below.

*Total number of people at one service facility: 5,000 (in 2025)*

*Total number of people at one service facility: 16,500 (in 2040)*

*Amount of daily water consumption for one person: 200 L/day/person x 2hr/24hr = 17 L/day/person*

*Maximum amount of water used by people at one service facility in 2025: 5,000 people x 17 L/day/person = 85 $m^3$/day*

*Maximum amount of water used by people at one service facility in 2040: 16,500 people x 17 L/day/person = 280 $m^3$/day*

Drinking water needs of personnel and passengers will be supplied by water bottles.

### *3.5.2.2 Wastewater and Waste*

#### 3.5.2.2.1 Wastewater

During the operation phase of the Project, domestic wastewater will be generated from passengers and the personnel to be employed. The amount of wastewater will vary according to the number of passengers. All wastewater from these facilities is planned to be designed into the local/municipal sewage network (if available nearby) or otherwise it is planned to install package WWTPs and discharge to the suitable receiving environment. All wastewater discharge must comply with national requirements and international standards prior to disposal.

The approximate wastewater generation during the operation phase at each service facility in 2025 and in 2040 is calculated using both the conservative approach, assuming all the water consumption will be converted to wastewater and using the wastewater to water ratio derived from the TURKSTAT Municipality Water and Wastewater Statistics. The calculations are as follows:

**Conservative Approach:**

*Maximum amount of water used by people at one service facility in 2025: 85 $m^3$/day*

*Maximum amount of water used by people at one service facility in 2040: 280 $m^3$/day*

*Water/Wastewater Ratio: 1*

*Wastewater generation amount in 2025 = 85 $m^3$/day x 1 = 85 $m^3$/day*

*Wastewater generation amount in 2040 = 280 $m^3$/day x 1 = 280 $m^3$/day*

**Approach Using Statistical Data:**

*Maximum amount of water used by people at one service facility in 2025: 85 $m^3$/day*

*Maximum amount of water used by people at one service facility in 2040: 280 $m^3$/day*

*Water/Wastewater Ratio: 0.65*[6]

[5] It is note that only 2025-2040 traffic projection information is provided and according to this projection, it is assumed that there will be an average of 2 people in cars and an average of 1 person in heavy vehicles.

[6] Turkish Statistical Institute, 2001-2022 Tekirdağ Municipality Water and Wastewater Statistics

*Wastewater generation amount in 2025 = 85 $m^3$/day x 0.65 = 55.3 $m^3$/day*

*Wastewater generation amount in 2040 = 280 $m^3$/day x 0.65 = 182 $m^3$/day*

#### 3.5.2.2.2 Wastes

Typical non-hazardous and hazardous wastes routinely generated at operations facilities are general office and packaging wastes, domestic wastes, waste oils, oil contaminated rags, used batteries, empty paint cans, waste chemicals and used chemical containers, used filters, fluorescent tubes, scrap metals and cables, end-of-life tires, electrical and electronic wastes and medical wastes.

##### *Domestic Solid Waste*

During the operation phase, the amount of domestic solid waste will depend on the number of personnel employed in the Project and also the number of the Motorway users. During the operation phase it is estimated that maximum 10,000 people in 2025 and 32,750 people in 2040[7] will use motorway service facilities in a day. According to TURKSTAT, the daily solid waste generation amount is 1.2 kg/day. It is assumed that each passenger will spend two hours at the Motorway Service facility. Thus, the total amount of waste generation daily is calculated below.

*Total number of people: 5,000 (in 2025)*

*Total number of people: 16,500 (in 2040)*

*Amount of daily solid waste generation by one person: 1.2 kg/day/person x 2hr/24hr = 0.1 kg/day/person*

*Total amount of solid waste generation by the passengers in 2025: 5,000 people x 0.1 kg/person/day = 500 kg/day*

*Total amount of solid waste generation by the passengers in 2040: 16,500 people x 0.1 kg/person/day = 1,650 kg/day*

**Table 23: The Amount and Type of Waste Expected* for Operation Phase**

| Type of Waste | Percentage (%) | Calculated amount (kg/day) In 2025 | Calculated amount (kg/day) In 2040 |
|---|---|---|---|
| Biowaste | 53.63 | 268.15 | 878.20 |
| Paper-Cardboard | 9.13 | 45.65 | 149.50 |
| Plastic | 5.45 | 54.5 | 89.25 |
| Glass | 3.54 | 27.25 | 57.95 |
| Metal | 1.18 | 5.9 | 19.35 |
| Flammable | 23.29 | 116.45 | 381.35 |
| Domestic Hazardous Waste | 0.65 | 3.25 | 10.65 |
| Other | 3.13 | 15.65 | 51.25 |

[7] It is note that only 2025-2040 traffic projection information is provided and according to this projection, it is assumed that there will be an average of 2 people in cars and an average of 1 person in heavy vehicles.

| Type of Waste | Percentage (%) | Calculated amount (kg/day) In 2025 | Calculated amount (kg/day) In 2040 |
|---|---|---|---|
| Total | 100 | 500 | 1,650 |

*Calculated according to the waste distribution percentages of the Central Anatolia Region

### *Hazardous Wastes*

The hazardous wastes generated during Project operation phase are consist of fluorescent tubes, cartridges, print toners, transformers, paints/varnishes, waste oils. Hazardous wastes may be generated directly from oily machine and equipment usage and maintenance operations.

For details information about the hazardous wastes please refer to the construction part (Section 3.5.1.1.2). Unlike the construction phase, no waste vegetative oil generation is expected as dining hall will not be established during the operation phase.

# 4.0 ANALYSIS OF PROJECT ALTERNATIVES

## 4.1 No – project Option

The Kınalı-Balıkesir Motorway Project, of which the Project is a part, is a main motorway starting from the European side of Istanbul (Kınalı District) passing through Tekirdağ Province and reaching the Gelibolu Peninsula by crossing the Bridge between the Sütlüce (European Side) and Şekerkaya (Anatolian Side) districts of Çanakkale. Finally, to the west of Balıkesir, it connects to the Gebze-İzmir Motorway.

The zero alternative to the Motorway option can be compared as follows:

- Kınalı-Balıkesir Motorway Project, from Europe to northwest of Türkiye, is the only alternative that will provide direct access to important industrial zones to promote the development of the Western Region of Türkiye. It will also contribute to the development of a major ring road around the Marmara Sea networks.
- The planned Motorway will contribute to alleviating the traffic problem in Istanbul caused by the traffic flow from Europe. It will also be an alternative to the traffic passage of the Bosphorus;
- After the completion of the Motorway, it will reduce the traffic load on the low standard roads and increase the traffic safety in the Area of Influence of the Project.

## 4.2 Location Selection

### 4.2.1 Route Selection

Within the scope of the Kınalı-Balıkesir Motorway route selection, the Project design was prepared by KGM several years ago and no detailed information was provided related to the background of deciding for the Project route. According to the Turkish EIA (2016), during the survey studies conducted to determine the project corridor, agricultural areas and livestock activities were taken into consideration. In this context, to ensure that the agricultural areas in the region are minimally affected, the route has been primarily planned to follow a path close to the existing line. Additionally, to minimize the impact on livestock activities along the route, engineering structures (such as culverts) have been designed.

As part of the Kınalı-Balıkesir Motorway project, two route alternatives were evaluated: Alternative 1 (designed during the EIA process of the Kınalı-Balıkesir Motorway) and Alternative 2 (designed at the beginning of the ESIA process of the Kınalı-Malkara Motorway Project). Both alternatives were assessed and compared based on the criteria given below. Alternative 1 was eliminated due to its lower performance on a significant number of assessment criteria compared to Alternative 2. Consequently, at the start of the ESIA process, Alternative 2 was selected as the Project Route..

The alternate routes assessment includes but not limited to the following:

- Meeting the Project criteria
- Cost
- Crossings (Roads, Pipelines, Irrigation areas, streams, and channels, Energy transmission lines)
- Geological structures (landslide, earthquake, etc.)
- Land use and existing settlements which would be impacted by the Project
- Expropriation
- Archaeological and biological important areas
- Facilities along the route which would be impacted by the Project

- Proximity to the legally protected areas

Subsequently, all baseline studies for the Project were conducted for Alternative 2. After completing the baseline studies, the route was reassessed, and modifications were made to minimize the impact on archaeological components.

Impacts on the identified cultural heritages within the Project Route were evaluated according to the "Guidance on Heritage Impact Assessments for Cultural World Heritage ("WH") Properties" published by International Council on Monuments and Sites (ICOMOS)[8]. Based on this assessment, the risk value of the identified cultural heritage sites (Table 24) was determined according to their distance from the route.

**Table 24: Categorization of the Archaeological Risk**

| Color | Distance to Route Axis | Explanation |
|---|---|---|
| | On the route | High Risk |
| | 0-50 m | Risky |
| | 50-100 m | Medium |
| | 100-150 m | Low |
| | Above 150 m | No Effect |

Following a detailed assessment, Alternative 3 was finalized as the route design for the project. A comparison between Alternative 2 and Alternative 3, based agricultural component, is shown in the table below. As can be seen, Alternative 3 is a much safer alternative in terms of impacts on archaeological sites/ cultural heritages.

**Table 25: Archaeological Sites regarding to Alternative Routes**

| No | Alternative-2 | Alternative-3 |
|---|---|---|
| High Risk | 13 | 6 |
| Risky | 4 | 3 |
| Medium | 5 | 8 |
| Low | 6 | 2 |
| No Effect | 12 | 21 |

Within the scope of the Project, alternative routes taken into consideration are shown in Figure 15. The latest changes in Alternative 2 which led the final design became an Alternative 3 is presented in detail in the following figures.

[8](https://www.iccrom.org/sites/default/files/2018-07/icomos_guidance_on_heritage_impact_assessments_for_cultural_world_heritage_properties.pdf).

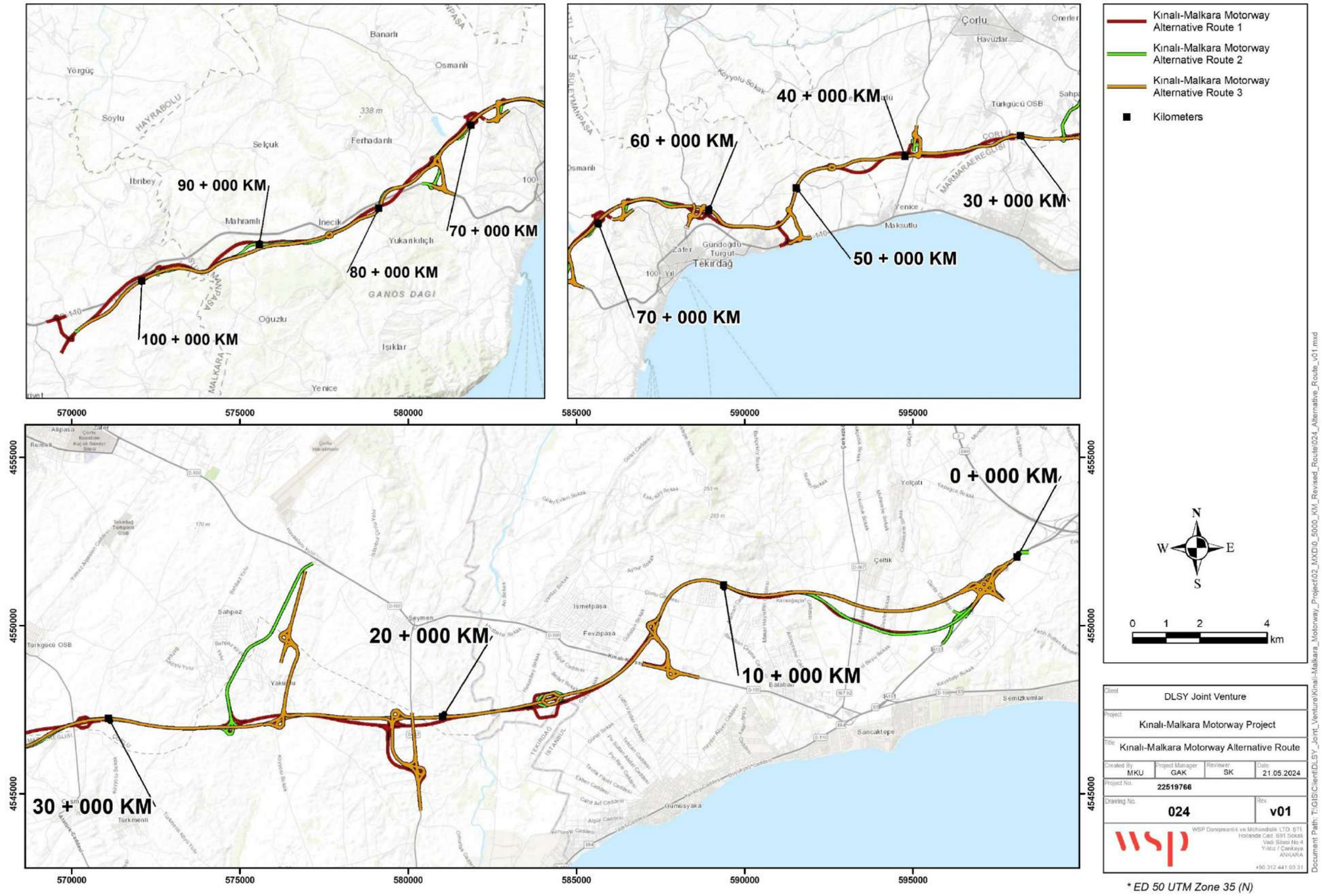



**Figure 15: Project Route Alternatives**

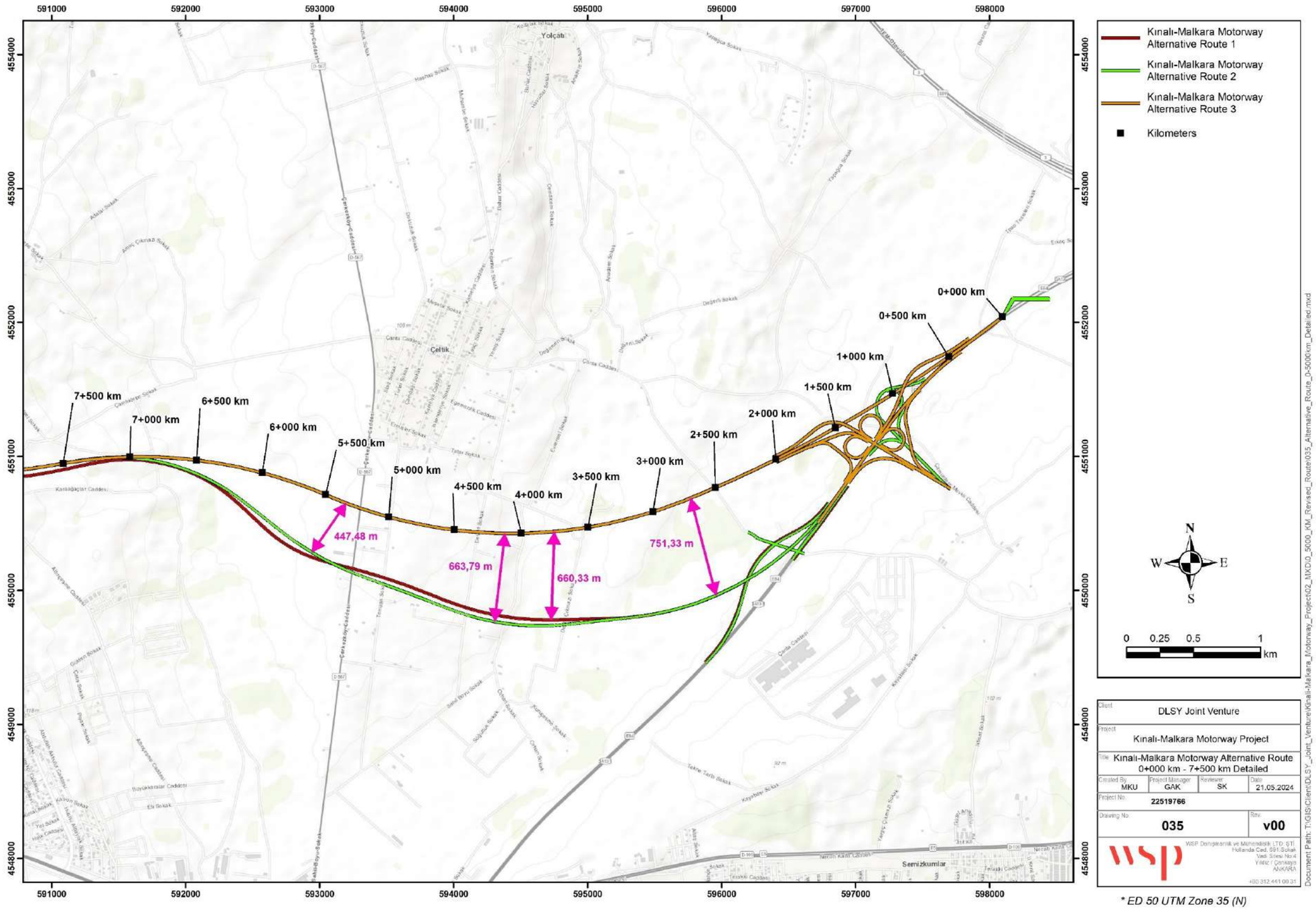



**Figure 16: Project Route Alternatives with distance differences**

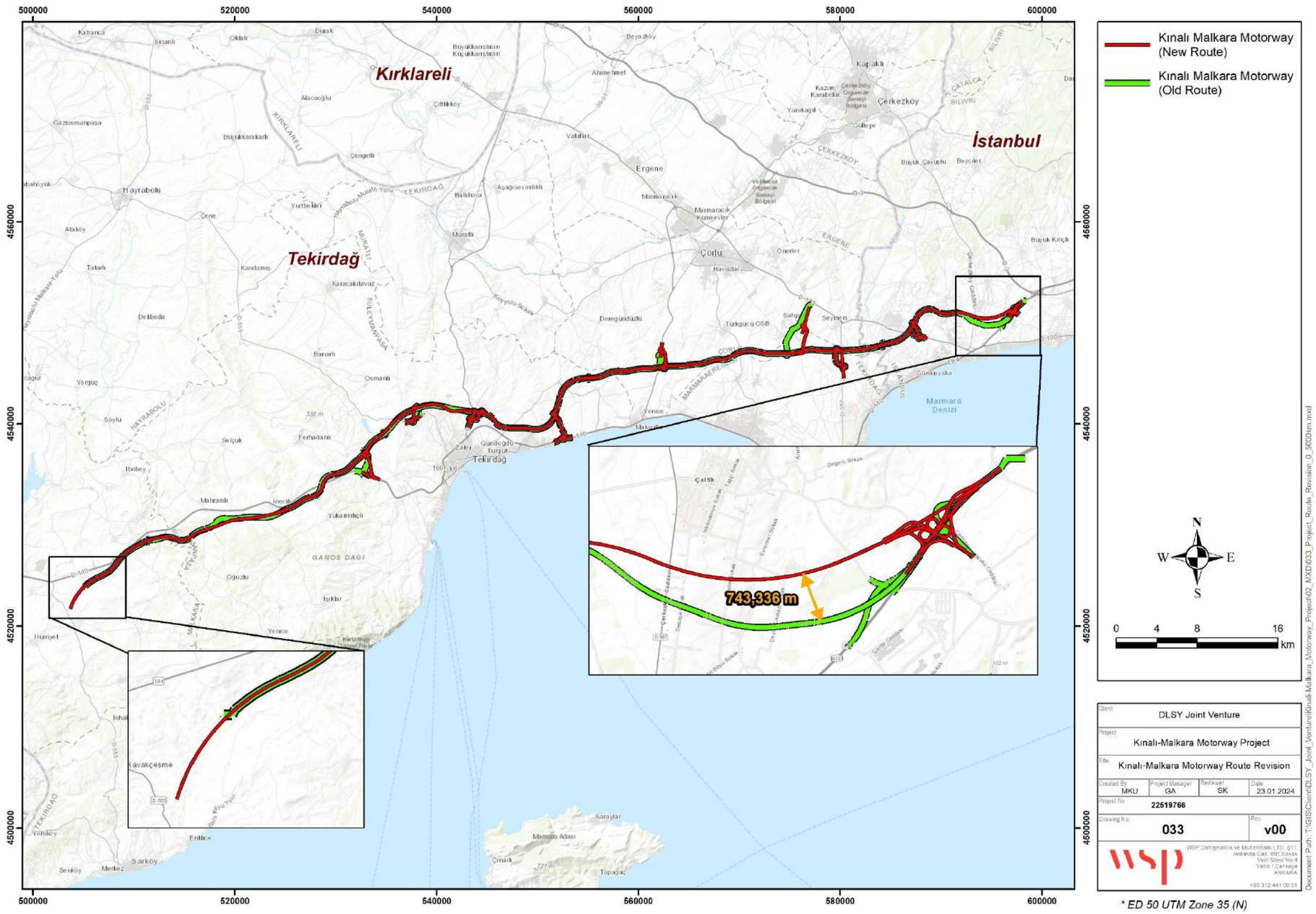



**Figure 17: Project Route Alternatives -Main difference between Alternative 2 and 3**

### 4.2.2 Location of the Associated Facilities

Within the scope of the Project, during the process of selecting and approving associated facilities and Project component locations ÇOK A.Ş. was considered followings;

- Priority is given to already opened and permitted facilities
- Meeting the Project criteria
- Distance of the facilities to the Project route
- Landscape
- Proximity of the legally protected areas
- Proximity of the residential areas
- Land ownership status (public land has priority)
- Archaeological sites/cultural heritage

A comprehensive options appraisal/analysis of alternatives for all quarries and associated facilities will be conducted to assess their suitability and potential impacts, including biodiversity considerations and other relevant factors, prior to any decision-making regarding facility selection. As a primary principle, the location of quarries and associated facilities within areas designated for their biodiversity value (e.g., KBAs, IBAs) will be avoided. If no viable alternatives exist outside such areas, this will be demonstrated through a detailed option appraisal/analysis of alternatives, with clear consideration of biodiversity sensitivity, before any decisions are made regarding facility selection.

The method, criteria, and timeframes for conducting the analysis of alternatives will be outlined in the Quarries and Associated Facilities Management Plan. The analysis of alternatives will be performed for all associated facility sites, not only those located within biodiversity-sensitive areas.

# 5.0 ESIA METODOLOGY

This chapter aims at describing the methodological approach of the process behind this ESIA, which is basically composed by three major steps:

1) **Definition of the baseline**, or the description of the environmental (i.e., physical, and biological components) and social context prior the realisation of the Project;

2) **Impact and risks assessment**, which is the evaluation of the possible interferences created by the Project on the environmental and social baseline conditions; and

3) **Identification of mitigation measures and definition of the Environmental and Social Management System Framework**, which identifies measures to avoid, reduce, mitigate, or offset the impacts and risks previously identified and assessed and organizes them in an ESMS framework for later implementation during Project construction and operations.

The general methodology adopted by WSP Türkiye for the Environmental, and Social Impact Assessment has been designed to be analytical and transparent and allow for a semi-quantitative analysis of the impacts on the various environmental and social components. This methodology is based on the concept that projects can generate both negative and positive impacts and the significance of each impact can be evaluated considering both the characteristics of different Project activities and the environmental and social context.

This methodology is based on three main analytical phases, as described below:

- **Phase 1: Identification of Project Actions and Impact Factors**
  - **Project actions:** activities directly or indirectly related to the Project that can interfere with the context, generating environmental or social pressures;
  - **Impact factors**: direct or indirect interferences generated by the Project actions on the context and able to influence the state or quality of one or more environmental and social components;
- **Phase 2: Identification of Environmental and Social Components and Sensitivity Level Allocation**
  - **Identification of the components potentially subject to interference:** using a specific cross-refence matrix between the impact factors and the Project actions, it is the process identifying the components potentially subject to impacts in each phase of the Project (i.e., construction, operation; decommissioning).
  - **Sensitivity of the component**: conditions that characterise the current quality and state of the environment and/or its resources, and social component ;
- **Phase 3: Impact Assessment**
  - **Impacts**: changes to the environmental and social components caused by the impact factors ;
  - **Mitigation measures**: actions adapted to mitigate negative impacts or to maximize the effects of positive impacts on the environmental and social components.

The three building blocks are illustrated in the figure below and described in the following paragraphs.

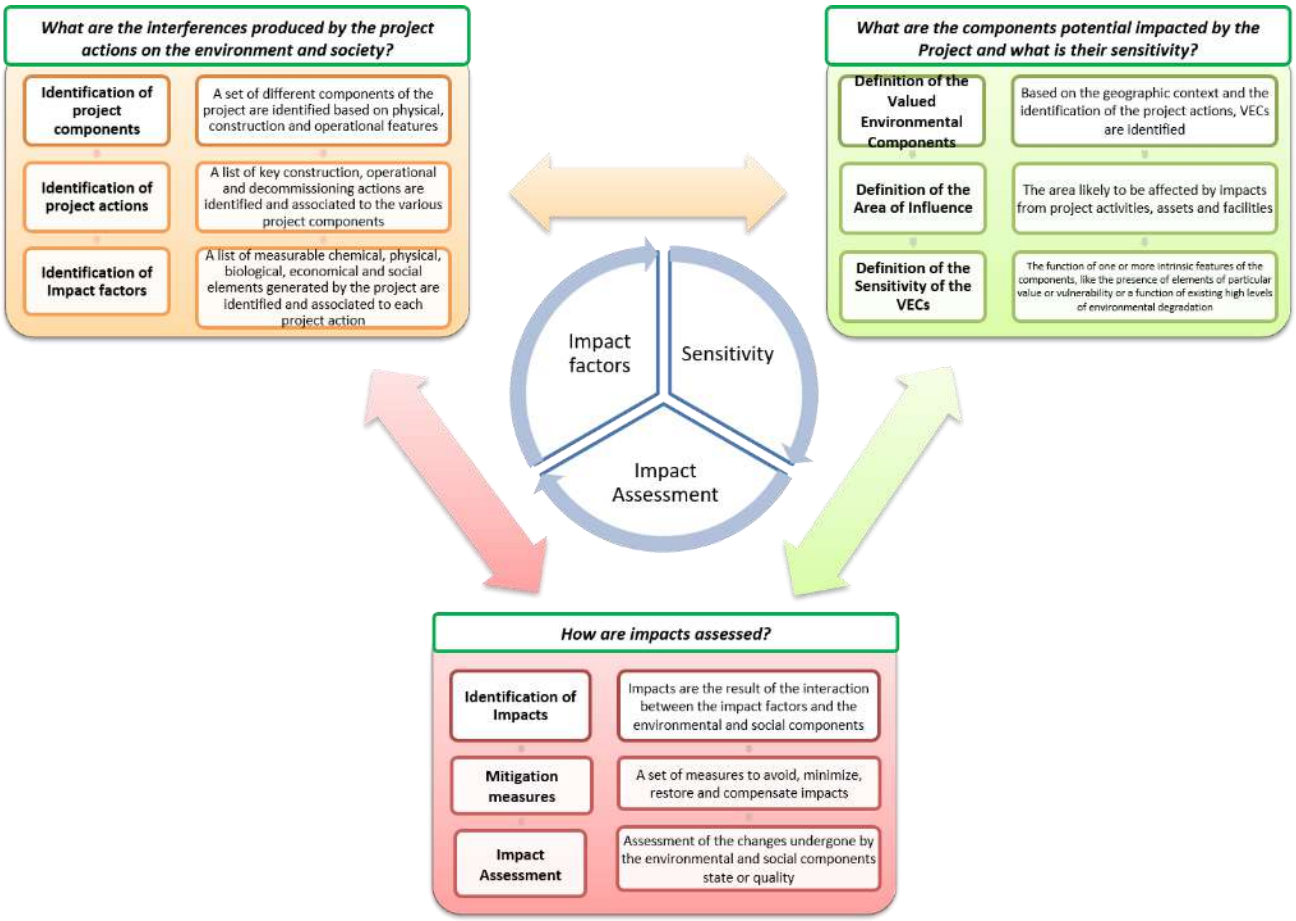



**Figure 18: Three Phases of ESIA Process**

## 5.1 Identification of Area of Influence

The Area of Influence ("AoI") of the Project is the area in which a direct or indirect impact on the biological, physical and social components might occur.

As defined by IFC PS1, the Area of Influence encompasses:

- The area likely to be affected by: (i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.
- Associated facilities, which are facilities that are not funded as part of the Project and that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable.
- Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the Project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

The baseline conditions represent the environmental (i.e., physical, and biological components) and social context prior the realization of the Project, thus, before any possible disturbance from Project activities may occur. The definition of the baseline conditions represents the starting point upon which the impact assessment is built. The goal is to assign a sensitivity value to each environmental and social component expected to be affected by the Project.

The identification of the Project's Area of Influence varies according to the environmental and social component assessed and is hence clearly defined in Chapter 6 separately for physical, biological and social components.

There are different AoIs used for the physical (Section 6.1.1) and social (Sections 6.3.1.1 and 6.3.2.1) components and within the context of the biodiversity baseline and impact assessment, reference is also made to the Local Study Area and the Regional Study Area, as further described in section 6.2.1 of the ESIA.

The Project AoI is presented in following tables and Figure 19.

**Table 26: Area of Influence – Physical Components**

| ESIA Component | AoI |
|---|---|
| Soil and Subsoil | AoI includes the Project footprint and temporary and associated facilities |
| Hydrology and Surface Water Quality | AoI includes the Project footprint and temporary and associated facilities |
| Hydrogeology and Groundwater Quality | AoI includes the Project footprint and temporary and associated facilities |
| Air Quality | AoI includes an area having boundaries a minimum of 2 km away from the Project Route, temporary and associated facilities |
| Noise and Vibration | AoI includes an area having boundaries 2 km away from the Project Route, temporary and associated facilities |

**Table 27: Area of Influence – Biological Components**

| Biological RSA and LSA | Definition |
|---|---|
| Terrestrial RSA | AoI corresponds to the **"PA0404 - Balkan mixed forests"** terrestrial ecoregion which is considered part of the broader "Temperate Broadleaf & Mixed Forests" category (Olson et al., 2001[9]) |
| Freshwater RSA | AoI corresponds to two main river basins, the **Meriç-Ergene Basin and Marmara Basin**, which are part of the "**423 – Thrace**" freshwater ecoregion, and a major sub-basin, the Karaçay Sub-basin, which fells within the "**418 – Dniester – Lower Danube**" freshwater ecoregion (Freshwater Ecoregions of the World – http://www.feow.org/[10]). |
| Terrestrial LSA – expected Area of Influence of the Project (i.e., the area beyond which no detectable effects on biodiversity are expected). | AoI includes the planned route of the motorway, the location of all associated facilities currently known (e.g., borrow pits, quarries, camp sites, storage areas, sub-construction site, concrete batching and asphalt plants) |
| Freshwater LSA – expected Area of Influence of the Project (i.e., the area beyond which no detectable effects on biodiversity are expected). | AoI designed taking into consideration all the river sub-basins interested by the Project. In particular, it crosses three river basins: the Meriç-Ergene Basin and Marmara Basin, part of the "423 - Thrace" freshwater ecoregion and drain in the Mediterranean and the Marmara see respectively, the Karaçay Basin part of the "418 - Dniester - Lower Danube" which drain in the Black Sea. |

**Table 28: Area of Influence – Social Components**

| ESIA Component | AoI |
|---|---|
| Socioeconomical | AoI includes 46 villages and neighbourhoods within the borders of Tekirdağ and İstanbul provinces including Çatalca, Silivri, Çorlu, Marmaraereğlisi, Süleymanpaşa, Şarköy and Malkara Districts. |
| Cultural Heritage | AoI includes all the Project components and associated facilities. Designed as a 250 m buffer (on both sides -total 500 m) around the Project Route, project components and associated facilities. |

[9] Olson, David M., et al. "Terrestrial Ecoregions of the World: A New Map of Life on Earth. A new global map of terrestrial ecoregions provides an innovative tool for conserving biodiversity." BioScience 51.11 (2001): 933-938.

[10] Abell, Robin, et al. "Freshwater ecoregions of the world: a new map of biogeographic units for freshwater biodiversity conservation." BioScience 58.5 (2008): 403-414.

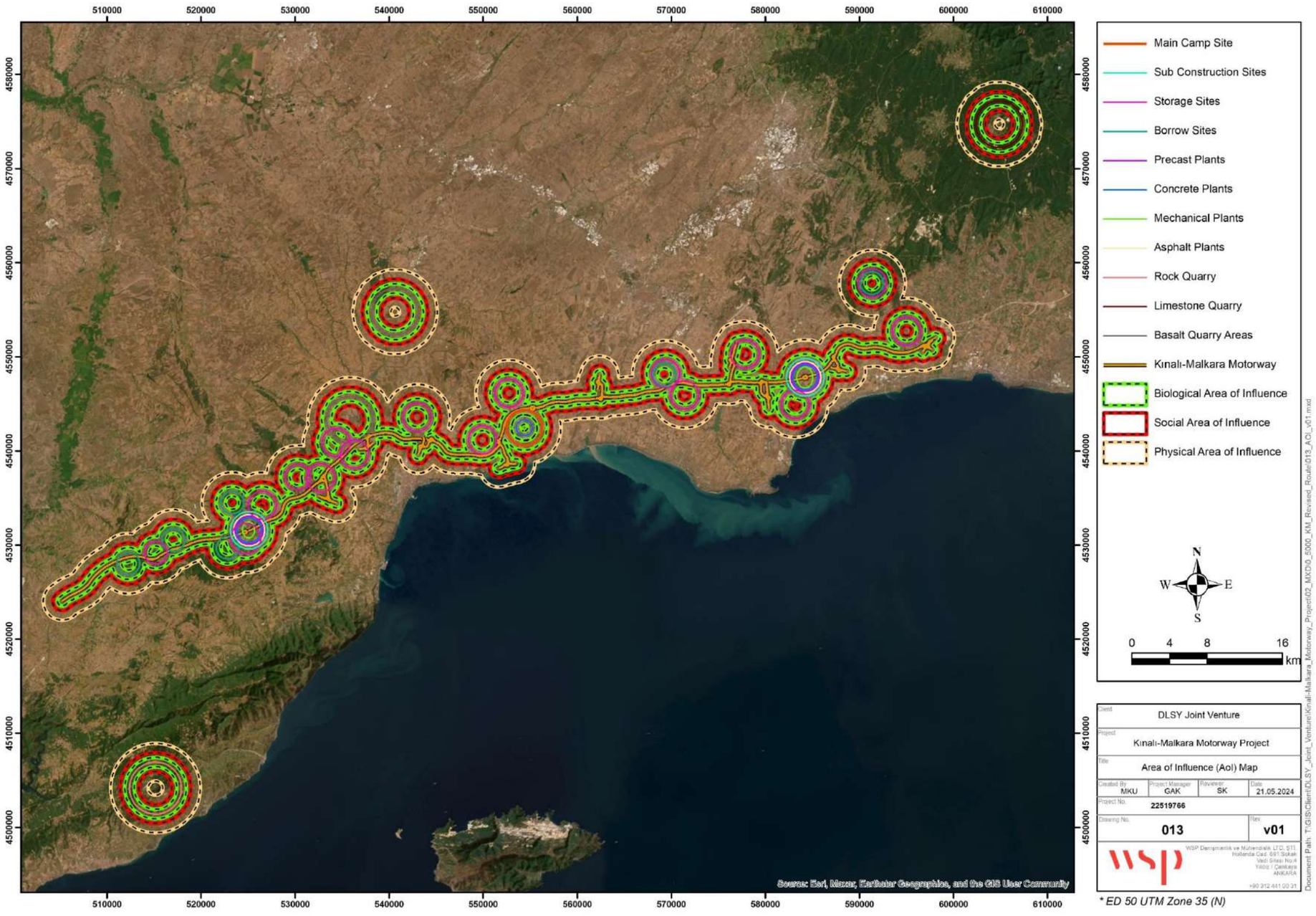



**Figure 19: Area of Influence of the Project[11]**

[11] The AoI boundaries shown on the map should be treated as representative. For each component, the zones were made according to the component whose AoI was determined as the widest. For example, considering the air and noise modelling studies for the physical component, a 2km buffer zone is represented in the map. For the full definition of AoIs, the explanations in the relevant sections should be taken into account.

## 5.2 Identification of the Project Components

Project components are identified coherently with the definition of the IFC PS1 as follows:

- The Project and the Project Owner's activities and facilities that are directly owned, operated, or managed (including by contractors) and that are an essential component of the Project;
- Unplanned but predictable developments caused by the Project that may occur later or at a different location; and
- Associated facilities, which are facilities that are not funded as part of the Project and that would not have been constructed or expanded if the Project did not exist and without which the Project would not be viable (IFC Guidance Notes: Performance Standards on Environmental and Social Sustainability, 2012).

## 5.3 Identification of the Project Actions

Project actions are activities directly or indirectly related to the project which can interfere with the environment as primary generative elements of environmental or social pressures, defined in the context of this methodology as impact factors.

Project actions associated with the Project's development from the site preparation and construction phases, through operations to decommissioning are listed below.

### Land Site Preparation and Construction Phase

- **Land acquisition (pre-construction):** includes all necessary administrative and field activities that allow the Project proponents to enter in possession of the Project areas.
- **Vegetation clearing:** includes removal of natural vegetation, particularly trees and shrubs to allow excavators and dozers to enter the work areas and other Project areas.
- **Surface levelling and grading (including dismantling of existing structures):** includes excavation and earthwork to create the surface over which the Project will be constructed.
- **Temporary stockpiling of material:** includes temporary storage of the Project elements or other construction materials in stock yards.
- **Transportation of construction materials**: includes transportation of the Project elements and construction material from the ports-station of arrival to the stock yards and camps and from the stockyards/camps to the working or construction areas.
- **Construction of the motorway and service facilities:** includes laying of concrete foundations, erection of buildings and infrastructures, electrical, hydraulic, telecommunication systems, etc.
- **Construction of the temporary and associated facilities:** includes laying of concrete foundations, erection of buildings and infrastructures, electrical, hydraulic, telecommunication systems, etc.
- **Disposal of waste deriving from construction (including excavated soil):** refers to the waste disposal activities (disposal of waste generated from all Project activities during construction phase, including excavated soil).

- **Disposal of wastewater:** refers to the wastewater disposal activities (wastewater from construction works, temporary facilities and associated facilities).
- **Operation of associated facilities during the construction:**
  - Operation of borrow pits (removal of topsoil, excavation, material loading, material transportation)
  - Operation of quarries (blasting, excavation, material loading, material transportation)
  - Operation of asphalt plant (preparation of plant-mix surfacing mixtures by hot mixing)
  - Operation of concrete batching plant (material loading, temporary storage of material, operation of facility, loading and transportation of concrete)
  - Operation of excess excavated material and top-soil storage areas (unloading of excess materials/topsoil, surface levelling and grading, storage)
  - Rehabilitation of borrow pits, quarries, and excess excavated material storage areas
  - Operation of camp sites and sub-construction sites
- **Resettlement and livelihood restoration:** includes all the activities to ensure that affected populations are resettled in adequate areas and their livelihood is maintained or enhanced.

## Operation Phase

- **Operation of the motorway and service facilities including the maintenance activities:** includes technical (operation of the plant/infrastructure, surveillance, monitoring, maintenance) and administrative activities to maintain the Project in operation according to standard operating procedures.
- **Disposal of waste deriving from operation:** refers to the waste disposal activities (disposal of waste generated from all Project activities during operation phase.
- **Disposal of wastewater:** refers to the domestic wastewater disposal activities from Project components (Motorway service facilities etc.).

## Decommissioning/Closure Phase (Not foreseen)

- **Disassembling:** includes demolition of existing structures like buildings, roads, culverts, etc.
- **Transport of dismantled material:** includes transportation of the Project elements and dismantled material from the ports-station of arrival to the stock yards and camps and from the stockyards/camps to the working or construction areas.
- **Disposal of waste deriving from disassembling:** refers to the waste disposal activities (disposal of waste generated from all Project activities during closure phase.
- **Closure of project activities**

## 5.4 Identification of the Impact Factors

Project Actions generate Impact Factors, intended as potential interferences that can influence, both positively or negatively, directly or indirectly, the environmental and/or social components.

By taken into consideration the national EIA process, international guidelines and previous experiences, Impact Factors as determined by the Project Actions are listed in the following table.

**Table 29: Project Actions and Relevant Impact Factors**

| Project actions | Impact factors |
|---|---|
| **Pre-construction and Construction** | |
| Land acquisition (pre-construction of the Project components) | Physical displacement (of houses and businesses)<br>Economic displacement (of households and businesses)<br>Impact on businesses<br>Access to ecosystem services<br>Access to land (agricultural and pasturelands) |
| Vegetation clearing<br><br>Surface levelling and grading (including dismantling of existing structures)<br><br>Temporary Stockpiling of Material<br><br>Transportation of construction materials<br><br>Construction of the motorway and service facilities<br><br>Construction of the associated facilities<br><br>Disposal of waste deriving from construction (including excavated soil)<br><br>Disposal of wastewater<br><br>Operation of associated facilities during construction<br><br>Resettlement and livelihood restoration | Changes in the local morphology<br>Pollutant emission to the soil<br>Topsoil and lower soil removal<br>Occupation of land<br>Changes in flow/circulation in natural water bodies (changes in local hydrology and surface water<br>Discharge of wastewater/water<br>Surface water pollution<br>Changes in surface run-off patterns<br>Changes in the local hydrogeology<br>Groundwater pollution<br>Emission of dust<br>Gaseous Emission<br>Greenhouse Gasses (GHG) Emissions<br>Emission of noise<br>Emission of vibration<br>Increase in vehicular traffic<br>Interruption of roads and limitation of traffic<br>Emission of light<br>Introduction of buildings/ infrastructures<br><br>Vegetation and topsoil removal<br>Changes in local hydrology and water quality<br>Increase in vehicular traffic<br>Emission of pollutants, dust, and particulate matter<br>Emission of noise and vibration<br>Introduction and spreading of alien species<br><br>Population increases during construction<br>Demand workforce<br>Demand for goods, materials, and services<br>Traffic and pedestrian safety |

| Project actions | Impact factors |
|---|---|
| | Community exposure to diseases<br>Security<br>Infrastructure and equipment design<br>Transport of dangerous goods<br>Access to education services<br>Access to health services<br>Damage on road transportation<br>Access to water sources<br>Surface runoff discharge to private parcels<br>Impact on gender issues<br>Impact on the vulnerable groups |
| **Operation** | |
| Operation of the motorway and service facilities including the maintenance activities<br><br>Disposal of waste deriving from operation<br><br>Disposal of domestic wastewater | Pollutant emission to the soil<br>Occupation of land<br>Surface water pollution<br>Discharge of wastewater/water<br>Changes in surface run-off patterns<br>Groundwater pollution<br>Changes in the local hydrogeology<br>Emission of dust<br>Gaseous Emission<br>GHG Emissions<br>Emission of noise<br>Emission of vibration<br>Emission of light<br>Introduction of buildings and infrastructures<br>Decreased Traffic Load in lower standard Road<br><br>Presence of new buildings/infrastructures<br>Presence of motorway traffic<br>Emission of pollutants and particulate matter<br>Emission of noise and vibration<br>Emission of light<br>Introduction and spreading of alien species<br><br>Population increases during operation<br>Demand for workforce<br>Demand for goods, materials, and services<br>Contribution on National Economy<br>Increased road traffic around the motorway service facilities and connected settlements<br>Transportation |

| Project actions | Impact factors |
|---|---|
| **Decommissioning** | |
| Disassembling<br><br>Transportation of dismantled material<br><br>Disposal of waste deriving from disassembling<br><br>Closure of Project activities<br>Land reclamation and restoration | A new impact is not expected other than those listed in the construction and operation phases in the decommissioning and closure phase (after the mitigation) of the Project.<br><br>Re-establishment of morphology and hydrology (positive impact)<br>Re-establishment of natural vegetation (positive impact) |

## 5.5 Identification of the Environmental and Social Components

Impacts are identified as potential interferences of the impact factors with the environmental components identified in the study area. The analysis is conducted by means of matrices where environmental components are listed as rows and impact factors as columns.

When an impact factor has a potential to alter an environmental and social component, an impact is identified in the matrix. Impact factors can have a direct or indirect impact over a certain component.

All direct and indirect impacts identified are described in terms of their mechanism of action and likely consequences.

Matrixes have been created to link physical, biological and social components to the Project actions and presented in Table 30, Table 31 and Table 32.

**Table 30: Matrix for Physical Components and Impact Factors**

| Component / Impact factor | Geology and Geomorphology | Geohazard and Seismology | Soil and subsoil | Hydrology and surface water quality | Hydrogeology and groundwater quality | Air quality | Noise | Vibration | Traffic and infrastructures | Visual |
|---|---|---|---|---|---|---|---|---|---|---|
| **Pre-construction and Construction** | | | | | | | | | | |
| Changes in local morphology | √ | √ | | | | | | | | |
| Pollutant emissions to the soil | | | √ | | | | | | | |
| Topsoil and lower soil removal | | | √ | | | | | | | √ |
| Occupation of land | | | √ | | | | | | | |
| Changes in flow/circulation in natural water bodies (changes in local hydrology and surface water) | | | | √ | | | | | | |
| Discharge of wastewater/water | | | | √ | | | | | | |
| Surface water pollution | | | | √ | | | | | | |
| Changes in the local hydrogeology | | | | | √ | | | | | |
| Groundwater pollution | | | | | √ | | | | | |
| Emission of dust | | | | | | √ | | | | √ |
| Gaseous emissions | | | | | | √ | | | | |
| GHG emission | | | | | | √ | | | | |
| Emission of noise | | | | | | | √ | | | |
| Emission of Vibration | | | | | | | | √ | | |
| Increased Vehicular Traffic | | | | | | | | | √ | |

| Impact factor \ Component | Geology and Geomorphology | Geohazard and Seismology | Soil and subsoil | Hydrology and surface water quality | Hydrogeology and groundwater quality | Air quality | Noise | Vibration | Traffic and infrastructures | Visual |
|---|---|---|---|---|---|---|---|---|---|---|
| Interruption of roads and limitation to Traffic | | | | | | | | | √ | |
| Emission of light | | | | | | | | | | √ |
| Introduction of buildings/ infrastructures | | | | | | | | | | √ |
| **Operation** | | | | | | | | | | |
| Pollutant emission to the soil | | | √ | | | | | | | |
| Occupation of land | | | √ | | | | | | | |
| Surface water pollution | | | | √ | | | | | | |
| Discharge of wastewater/water | | | | √ | | | | | | |
| Changes in surface run-off patterns | | | | √ | | | | | | |
| Groundwater pollution | | | | | √ | | | | | |
| Changes in the local hydrogeology | | | | | √ | | | | | |
| Emission of dust | | | | | | √ | | | | |
| Gaseous Emission | | | | | | √ | | | | |
| GHG Emissions | | | | | | √ | | | | |
| Emission of noise | | | | | | | √ | | | |
| Emission of vibration | | | | | | | | √ | | |
| Emission of light | | | | | | | | | | √ |
| Introduction of buildings and infrastructures | | | | | | | | | | √ |

| Impact factor \ Component | Geology and Geomorphology | Geohazard and Seismology | Soil and subsoil | Hydrology and surface water quality | Hydrogeology and groundwater quality | Air quality | Noise | Vibration | Traffic and infrastructures | Visual |
|---|---|---|---|---|---|---|---|---|---|---|
| Decreased Traffic Load in lower standard Road | | | | | | | | | √ | |

**Table 31: Matrix for Biological Components and Impact Factors**

| Impact factor \ Component | Biodiversity component | Natural Habitats | Critical habitats |
|---|---|---|---|
| **Pre-construction and Construction** | | | |
| Vegetation and topsoil removal | √ | √ | √ |
| Changes in local hydrology and water quality | √ | √ | √ |
| Increase in vehicular traffic | √ | √ | √ |
| Emission of pollutants, dust, and particulate matter | √ | √ | √ |
| Emission of noise and vibration | √ | √ | √ |
| Introduction and spreading of alien species | √ | √ | √ |
| **Operation** | | | |
| Presence of new buildings/infrastructures | √ | √ | √ |
| Presence of motorway traffic | √ | √ | √ |
| Emission of pollutants and particulate matter | √ | √ | √ |
| Emission of noise and vibration | √ | √ | √ |
| Emission of light | √ | √ | √ |

| Impact factor \ Component | Biodiversity component | Natural Habitats | Critical habitats |
|---|---|---|---|
| Introduction and spreading of alien species | √ | √ | √ |
| **Decommissioning/Closure Phase** | | | |
| Increase in vehicular traffic | √ | √ | √ |
| Emission of noise and vibration | √ | √ | √ |
| Introduction and spreading of alien species | √ | √ | √ |
| Re-establishment of morphology and hydrology (positive impact) | √ | √ | √ |
| Re-establishment of natural vegetation (positive impact) | √ | √ | √ |

**Table 32: Matrix for Social Components and Impact Factors**

| Impact factor \ Component | Population and Demography | Economy and Employment | Community Health and | Resettlement and Land | Infrastructure and Services | Gender Assessment | Vulnerable Groups | Cultural Heritage |
|---|---|---|---|---|---|---|---|---|
| **Pre-construction and Construction** | | | | | | | | |
| Physical displacement (of houses and businesses) | | | | √ | | | | |
| Economic displacement (of households and businesses) | | | | √ | | | | |
| Loss of agricultural land | | | | √ | | | | |
| Access to ecosystem services | | | | √ | | | | |
| Temporary loss of livelihoods | | | | √ | | | | |
| Impacts on businesses | | | | √ | | | | |

| Impact factor \ Component | Population and Demography | Economy and Employment | Community Health and | Resettlement and Land | Infrastructure and Services | Gender Assessment | Vulnerable Groups | Cultural Heritage |
|---|---|---|---|---|---|---|---|---|
| Population increases during construction | √ | | | | | | | |
| Demand workforce | | √ | | | | | | |
| Demand for goods, materials, and services | | √ | | | | | | |
| Traffic and pedestrian safety | | | √ | | | | | |
| Community exposure diseases | | | √ | | | | | |
| Security | | | √ | | | | | |
| Infrastructure and equipment design | | | √ | | | | | |
| Transport of dangerous goods | | | √ | | | | | |
| Access to education services | | | | | √ | | | |
| Access to health services | | | | | √ | | | |
| Damage on road transportation | | | | | √ | | | |
| Access to water sources | | | | | √ | | | |
| Surface runoff discharge to private parcels | | | | | | | | |
| Impact on gender issues | | | | | | √ | | |
| Impact on the vulnerable groups | | | | | | | √ | |
| Cultural heritage impact | | | | | | | | √ |
| **Operation** | | | | | | | | |
| Population increases during operation | √ | | | | | | | |

| Impact factor / Component | Population and Demography | Economy and Employment | Community Health and | Resettlement and Land | Infrastructure and Services | Gender Assessment | Vulnerable Groups | Cultural Heritage |
|---|---|---|---|---|---|---|---|---|
| Demand for workforce | | √ | | | | | | |
| Demand for goods, materials, and services | | √ | | | | | | |
| Contribution on national economy | | √ | | | | | | |
| Increased road traffic around the motorway service facilities and connected settlements | | | √ | | | | | |
| Improved road safety and shortened travel time | | | √ | | | | | |
| Access to land (agricultural and pasturelands) | | | | √ | | | | |
| Transportation | | | √ | | | | | |

## 5.6 Impact Assessment

### 5.6.1 Assignment of the Sensitivity Level

As previously stated, the final goal in determining the Project's baseline is the evaluation of the sensitivity of each environmental and social component as a precondition to perform the impact assessment.

Each environmental and social component in the area of influence of the Project has a different sensitivity to the impact factors generated by the Project or can pose a different level of risk to the Project. The sensitivity of an environmental component is typically evaluated based on the presence/absence of some features which define both the current degree of the environmental quality and the susceptibility to environmental changes of the component. As examples, for physical components the sensitivity is typically related to the presence of elements that are at the highest or lowest scale of quality, for biodiversity it is related to the presence of threatened, endemic, or protected species or habitats and for social components to the presence of vulnerable elements of the community like poor, elderly, members of ethnic or religious minorities, indigenous people, etc. The **sensitivity ("S")** of the component is defined using component specific metrics during the baseline and can assume values between 1 and 5 associated to a definition from Low to High. The S value is assigned considering both the component's characteristics and the possible presence of sensitivity features.

The following list presents potential sensitivity features to be considered in defining the sensitivity of typical environmental and social components considered in ESIA studies. The specific metrics and levels of sensitivity for each of the features considered defined during the baseline studies and presented in this ESIA Report.

Geology and geomorphology & Natural Hazard Seismology:

- Presence of faults: areas with active faults are considered to pose highest risks to the Project and hence are considered of higher sensitivity;
- Presence of landslides: areas within the range of landslides are considered to pose highest risks to the Project and hence are considered of higher sensitivity;
- Other geohazards: (karst areas, slope erosion, liquefaction, stream channels, etc.). the presence of other geohazards in the Project area is considered of higher sensitivity; and
- Seismicity: the location of the Project in areas classified as at seismic risk is considered of higher sensitivity.

Soils:

- Soil agricultural potential: soils with highest agricultural potential according to local or global assessments are attributed a higher sensitivity;
- Soil erosion potential: soils with highest erosion potential according to local or global assessments are attributed a higher sensitivity; and
- Soil pollution potential: soils in areas identified and previously used for industrial, mining, or intensive agriculture are attributed a higher sensitivity.

Surface water:

- Presence of waterbodies in the Project area of influence and level of ecological integrity; the sensitivity increases with the level of ecological integrity;

- Presence of waterbodies in the Project area of influence and level of water/sediment pollution; the sensitivity increases in the presence of polluted watercourse; and
- Presence of waterbodies and level of tolerance to hydrological changes; the sensitivity is higher for waterbodies with a low level of tolerance for hydrological changes.

Groundwater:

- Presence of shallow aquifers; the sensitivity increases with the presence of shallow aquifers that could be more easily exposed to contamination source;
- Productivity of exploited aquifers; aquifers with low productivity might be depleted in case the Project entails groundwater abstraction. The sensitivity is higher for aquifer with low productivity;
- Presence and extent of existing groundwater exploitation; the sensitivity is higher for aquifers already exploited;
- Rock permeability; the sensitivity increases in case the subsoil is made of rocks with high permeability; and
- Aquifer vulnerability; the sensitivity increases with the vulnerability of the aquifer as determined by accepted methodologies.

Air quality:

- Presence of settlements and population potentially exposed to air emissions from the Project; the sensitivity increases with the number of people exposed;
- Presence of vulnerable targets (schools, hospitals, retirement houses, etc.) exposed to air emissions from the Project; the sensitivity increases with the number of vulnerable people exposed;
- Air quality levels in the areas affected by the Project; the sensitivity increases in areas already polluted and in areas designated for air quality protection; and
- Presence of sensitive ecological receptors like protected or classified areas, protected or endangered habitats and species.

Noise and vibration:

- Presence of settlements and population potentially exposed to noise and vibration from the Project; the sensitivity increases with the number of people exposed;
- Presence of vulnerable targets (schools, hospitals, retirement houses, etc.) exposed to noise and vibration from the Project; the sensitivity increases with the number of vulnerable people exposed;
- Noise and vibration levels and/or sources in the areas affected by the Project; the sensitivity increases in areas already experiencing high levels of noise and vibrations and in areas designated for protection from noise and vibrations; and
- Presence of sensitive ecological receptors like protected or classified areas, protected or endangered habitats and species.

Landscape and components with sensitivity to visual quality:

- Presence and number of settlements/people within the visual zone of visual influence.
- Presence of areas of touristic interest within the visual zone of visual influence.
- Presence of roads and volume of traffic within the visual zone of visual influence.
- Presence of archaeological, cultural, historic areas within the visual zone of visual influence.
- Presence of natural parks protected and classified areas within the visual zone of visual influence.

Habitats and biodiversity features:

- Number of species of flora or fauna present in the habitat. The sensitivity increases with the number of species present.
- Presence of threatened species of flora or fauna in the habitat as defined by global (IUCN) or national red lists. The sensitivity increases with the number of threatened species present and the threat level.
- Presence of endemic or restricted range species of flora or fauna in the habitat as defined by global (IUCN) or national red lists. The sensitivity increases with the number of species present and the level of endemicity.
- Presence of protected species or species listed in international conventions for the protection of biodiversity. The sensitivity increases with the number of protected/listed species.
- Presence of invasive alien species. The sensitivity is higher for habitats in areas with a higher number of invasive alien species present.
- Presence of natural habitats; the sensitivity increases with the surface of natural habitats present in the Project area of influence.
- Presence of threatened or protected habitats; the sensitivity increases with the surface of threatened or protected habitats present in the Project area of influence.
- Presence of critical habitats; the sensitivity increases with the surface of critical habitats present in the Project area of influence.
- Presence of relevant nursery, spawning or feeding grounds or migration routes.

Protected areas:

- Presence of protected areas; the sensitivity increases with the number, extent and level of protection of protected areas present in the Project area of influence.

Local communities:

- Presence of skilled personnel in the local community; the sensitivity (to positive impacts) is higher the more people with skills relevant to the Project.
- Presence of businesses and economic activities relevant to the Project; The sensitivity to positive impacts is higher for communities with a well-structured business community.

- Level of health care available; the Project could cause a population influx that can put a strain to existing health services if left unmanaged. The sensitivity of communities is higher in areas with an insufficient level of healthcare available.
- Presence of communicable diseases; the spreading of communicable diseases can be exacerbated by the influx of workers due to the Project. The sensitivity of communities is higher for those more prone to be affected due to local conditions.
- Overall health state of the population; the Project might cause increased levels of exposure to environmental health determinants like air pollutants, noise and vibrations, etc. The sensitivity of communities is higher in the presence of existing health issues in the communities potentially affected by the Project.
- The presence of environmental health determinants like air and water pollution, soil and groundwater contamination increase the community sensitivity.
- Areas with concentrated fisheries activities; areas with abundance of fishery resources.

Education

- Presence of education facilities;
- Level of education of the population;

Health

- Level of health care available; the Project could cause a population influx that can put a strain to existing health services if left unmanaged. The sensitivity is higher in areas with an insufficient level of healthcare available;
- Presence of communicable diseases; the spreading of communicable diseases can be exacerbated by the influx of workers due to the Project. The sensitivity is higher in areas affected by a high level of communicable diseases.
- Overall health state of the population; the Project might cause increased levels of exposure to environmental health determinants like air pollutants, noise and vibrations, etc. The sensitivity is higher in the presence of existing health issues in the communities potentially affected by the Project.
- Presence of existing environmental health determinants. The presence of environmental health determinants like air and water pollution, soil and groundwater contamination are increasing the sensitivity.

Ecosystem Services

- Presence of ecosystem services;
- Dependence of the local communities from ecosystem services

Cultural heritage:

- Presence of protected or recognized sites of archaeological or cultural value; the sensitivity increases with the number, cultural/scientific value and level of protection of sites potentially affected;

- Presence of sites with a high archaeological potential in the absence of specific site information or appropriate protection mechanisms; the sensitivity increases with the archaeological potential as indicated by relevant experts;
- Presence of intangible cultural values like sacred sites, initiation sites, sites used for cultural events, sites recognized in oral traditions, etc. the sensitivity increases with the number of sites and values as recognized by the local communities.

The component's Sensitivity can vary from low (1) to high (5) according to the following definitions:

- **Low (1):** the component does not present elements of sensitivity;
- **Medium-low (2)**: the component presents few elements of sensitivity that have limited significance;
- **Medium (3):** the component presents numerous elements of sensitivity that have limited significance;
- **Medium-high (4):** the component presents few elements of sensitivity that have high significance; and
- **High (5):** the component presents numerous elements of sensitivity that have high significance

The list of sensitivity features represents a tool/guideline used by the experts along with the "expert judgement" to rank the sensitivity of each component in the abovementioned five classes. For the biodiversity components the sensitivity assessment also considered the ecological and biological characteristics of each component in relation to the possible impacts generated by the Project.

Sensitive receptors of the project were identified through satellite images and interviews with the mukhtars of nearby settlements and local community members during the social baseline field studies. Mosques, schools, cemeteries, and hospitals were defined as sensitive receptors. These receptors within a 1 km buffer zone on both sides of the route (a total of 2 km) were thoroughly scanned along the entire route. The sensitive receptor maps for Project is shown in Figure 20. Details about the settlements that will be most affected by the project activities are provided in the Social Chapters.

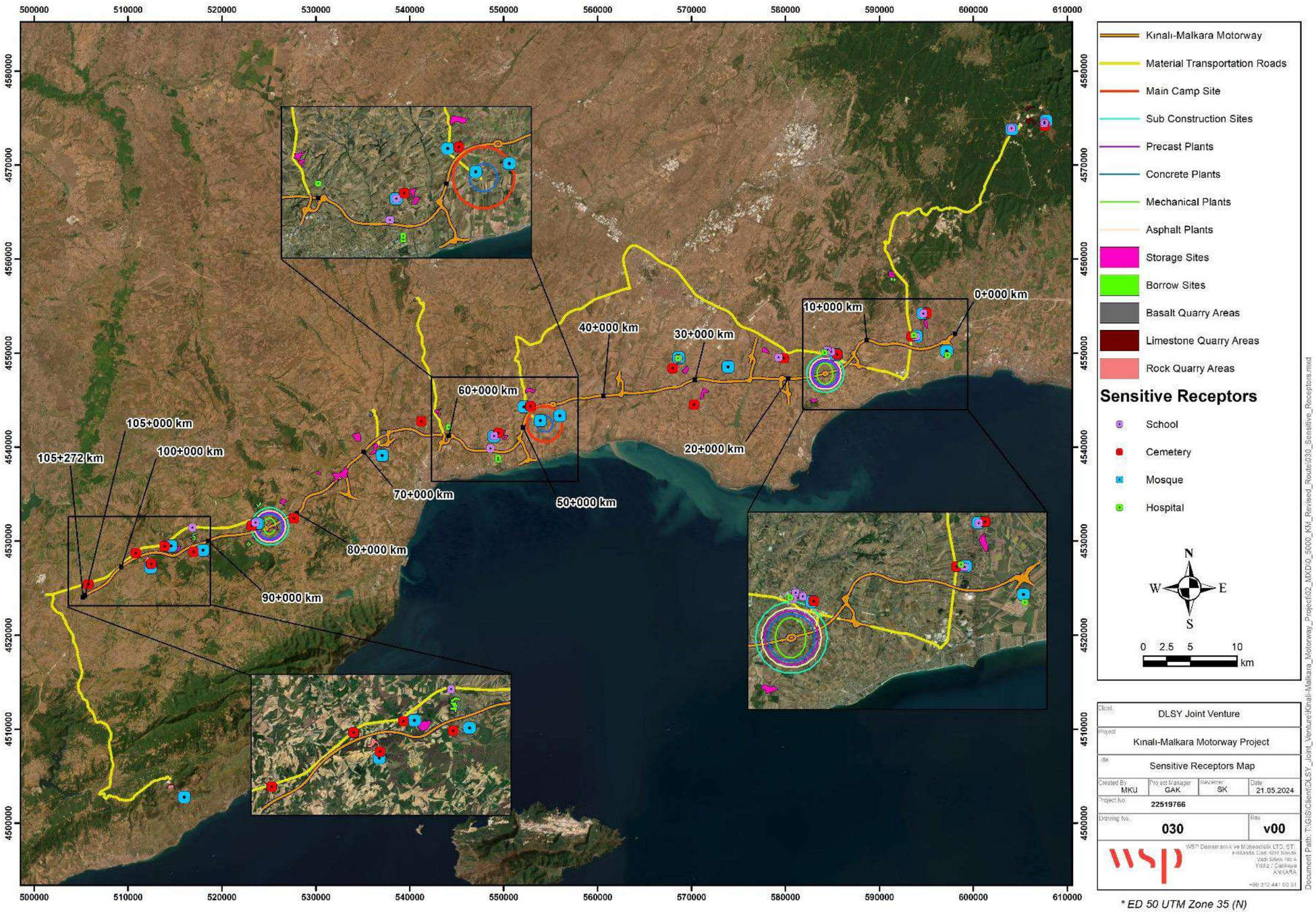



**Figure 20: The sensitive receptor map of the Project**

### 5.6.2 Scoring of the Impact Factors

The **impact factors** identified during the analysis of the Project and through the definition of the Project phases and Project actions are assessed in their relevance, using a scoring system. The parameters considered to assess the impact factor score are the following:

**Duration (D):** is the duration of the impact factor and can vary from short to long according to the following definitions:

- very short, when the duration is shorter than a month;
- short when the duration is between a month and one year;
- medium when the duration is between one and two years;
- long when the duration is between two and five years;
- very long when the duration is over five year.

**Frequency (F):** is the frequency with which the impact factor manifests itself:

- single event;
- infrequent, if it consists of a few events evenly or randomly distributed over time;
- recurrent, if it consists of numerous events evenly or randomly distributed over time;
- frequent if it consists of a high number of events evenly or randomly distributed over time;
- continuous, if the event has no interruption over time.

**Geographic extent (G):** is the geographical area within which the impact factor can exert its effects:

- Project site; the impact factor is confined within the facilities owned or exclusively controlled by the Project;
- local; the impact factor extends to the areas or communities neighbouring the Project site
- regional; the impact factor extends to an area beyond the surroundings of the Project site and to regional physical (airshed – watershed, etc) or administrative boundaries
- national; the impact factor extends throughout several regions or to the entire country
- international: the impact factor has an international or global reach

**Intensity (I):** is a measure of the physical, economic or social severity of the impact factor:

- negligible: the impact factor is generated in quantities that cannot be easily detected or perceived and that are unlikely to be able to cause any detectable change in the target environmental or social components;
- low: the impact factor is generated in quantities that can be detected or perceived but whose effects are unlikely to cause tangible changes in the target environmental or social components;

- medium, the impact factor is generated in quantities that are well within legal standards or accepted practices and/or whose effects are likely to cause tangible changes in the target environmental or social components;
- high, the impact factor is generated in quantities that at the limit of legal standards or accepted practices and/or whose effects are likely to cause serious impairment in the target environmental or social components;
- very high, the impact factor is generated in quantities that are at risk of exceeding the limits of legal standards or accepted practices and/or whose effects are likely to cause very serious to catastrophic damage to the target environmental or social components;

Each of the parameters listed above can have a value between 1 and 5, and severity of the impact is determined through an **Impact Factor Score** which is the sum of the 4 parameters, hence it can assume a value between 5 and 20.

### 5.6.3 Calculation of the Impact Value

The calculation of the **Impact Value** is done by multiplying the Impact Factor Score for the value of the sensitivity of the target component, determined during the baseline. The result is then corrected by considering the reversibility of the impact.

The reversibility is the property of an impact to diminish its magnitude over time and to eventually recede entirely. Reversibility may vary from reversible to irreversible according to the following definitions:

- reversible in the short term if the initial condition of the component will be restored in a period between weeks and months after the end of the impact factor and/or the restoration activities;
- reversible in the short/midterm if the initial condition of the component will be restored in a period between a few months and one year after the end of the impact factor and/or the restoration activities;
- reversible in the midterm if the initial condition of the component will be restored in a period between one year and five years after the end of the impact factor and/or the restoration activities;
- reversible in the long term if the initial condition of the component will be restored in a period between five and 25 years after the end of the impact factor and/or the restoration activities;
- irreversible, if it is not possible to predict the restoration of the initial conditions.

The reversibility of the impact is measured on a scale 1 to 5, with 5 ranked as irreversible and 1 ranked as reversible within short-term.

The **Impact Value ("IV")** is calculated by multiplying the Impact Factor Score + the Sensitivity and by the value of the Reversibility IV= IFS x S x R

## 5.7 Calculation of the Residual Impact

The next step consists in defining mitigation measures and assessing their effectiveness to reduce or eliminate the negative impact (or to maximize the positive one). The mitigation measures are defined with reference to the mitigation hierarchy listed below in descending order of effectiveness:

- Avoid;
- Minimize;
- Restore;
- Offset;
- Compensate.

The effectiveness of the mitigation measures defined in the environmental and social management plans is assessed using expert judgement and the outcomes from previous applications of similar mitigation measures to similar Projects. The definitions of the mitigation effectiveness may vary from none to high, as described below:

- None: the measures can reduce the impacts by less than 20% of the expected outcome;
- Medium low: the measures can reduce the impacts by 20% - 40% of the expected outcome;
- Medium: the measures can reduce the impacts by 40% - 60% of the expected outcome;
- Medium high: the measures can reduce the impacts by 60% - 80% of the expected outcome;
- High: the measures can reduce the impacts by more than 80% of the expected outcome.

The Mitigation effectiveness is measured on a scale from 1 to 0.2 (1 = minimum effectiveness; 0.2 = maximum effectiveness) and the **Residual Impact Value (RIV)** is calculated multiplying the impact value with the impact mitigation effectiveness as per the following formula: RIV = IV x M

### *Positive impacts*

Positive impacts are typically associated with economic and social opportunities and sometimes with environmental aspects a Project can solve (for example: a Project located in a brownfield where existing environmental issues can be addressed). Projects are typically promoting activities to enhance the economic, social, and environmental opportunities through specific programs, plans and measures including, for example, professional skills generation, community investment, shared value programs, remediation programs, biodiversity conservation Projects, etc.

The assessment of positive impacts is based on the same parameters used to evaluate the negative ones. The only difference is that the mitigation measures are replaced by enhancement measures, or measures to maximize the potential positive impacts.

The enhancement measures effectiveness defined in the environmental and social management plan is assessed using expert judgement and the outcomes of previous application of similar enhancement measures to similar Projects. The definitions of the enhancement effectiveness may vary from none to high as shown below:

- None: the measures can enhance the positive impacts by less than 10% of the expected outcome;
- Medium low: the measures can enhance the positive impacts by 10% - 20% of the expected outcome;

- Medium: the measures can enhance the positive impacts by 20% - 30% of the expected outcome;
- Medium high: the measures can enhance the positive the impacts by 30% - 40% of the expected outcome;
- High: the measures can enhance the positive impacts by more than 40% of the expected outcome.

## 5.8 Scale of Residual Impacts

The scale of the residual impact resulting from the calculation described above ranges from 0,8 to 500. The impact value is then scaled in 5 levels by diving the entire distribution of values obtained in 5 classes with an equal number of values obtained.

The residual negative impacts are classified in 5 levels using the table below.

| Residual impact score | Residual impact definition | Colour Code |
|---|---|---|
| 0.8 – 33.0 | Negligible | |
| 33.1 – 76.0 | Low | |
| 76.1 – 136.0 | Medium | |
| 136.1 – 228.0 | High | |
| 228.1 – 500.0 | Very High | |

The residual positive impacts are classified in 5 levels using the table below.

| Residual impact score | Residual impact definition | Colour Code |
|---|---|---|
| 0.8 – 33.0 | Negligible | |
| 33.1 – 76.0 | Low | |
| 76.1 - 136.0 | Medium | |
| 136.1 - 228.0 | High | |
| 228.1 – 500.0 | Very High | |

## 5.9 Overall Assessment

The methodology described above allows for an analytical assessment of impacts caused by individual impact factors over individual environmental and social components. The process therefore results in a table presenting several impacts from different impact factors for each component.

The table defines the assessment of the overall impact on each component. It represents a synthesis of the impacts on a component from all the impact factors generated by the Project actions. The impact assessment provides a comprehensive view of the impact value that affects the environmental or biological component.

The impact assessment is expressed based on the assessor's experience, assigning higher weight to the values less favourable to the component's protection, in order to guide the assessment toward a more conservative approach.

Impacts are presented in separate tables for negative and positive impacts to avoid automatic trade-offs and/or mediating between positive and negative aspects, as they are often targeting different sections of the community.

## 5.10 Cumulative Impact Assessment

Cumulative impacts are caused by the accumulation and interaction of multiple stresses affecting the parts and the functions of ecosystems. Of particular concern is the knowledge that ecological systems sometimes change abruptly and unexpectedly in response to apparently small incremental stresses.

IFC Performance Standard 1 (2012) and another recent publication by IFC (Good Practice Handbook on Cumulative Impact Assessment and Management, August 2013) require that the ESIA includes a cumulative impact assessment ("CIA"), i.e., "*cumulative impacts that* result *from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted*".

IFC guidelines denote that the scope of the CIA should be commensurate with the extent of cumulative impacts anticipated. This gives good direction to produce a focused assessment, considering only relevant disciplines. Cumulative impacts are limited to those impacts generally recognized as important on the basis of scientific concerns and/or concerns from Affected Communities[12]. In addition, although the quoted requirements indicate that *past, present and reasonably foreseeable/reasonably defined developments* including *unplanned but predictable activities* should be considered in the assessment, it is clear that most if not all of past and existing developments have generated or generate impacts that contribute in defining the existing baseline on which the Project will cumulate its impacts. This implies that impacts of past and existing projects will be captured in the baseline investigations, and the cumulative impact assessments therefore comes down to assessing how the Project impacts may cumulate with future impacts of existing projects or with impacts from future or reasonable planned and foreseeable developments, whose impacts have to be estimated and predicted as they are not yet occurring.

Cumulative impacts can result from various types of interaction among different impact factors:

- Impacts arising from the accumulation of different impact factors at a specific location or over a specific receptor; as an example, the concurrent presence of the emission of noise and emission of dust during construction at the same location;
- Impacts arising from the same impact factor over the same receptor in a different geographic location; as an example, the degradation of the same habitats in different locations may harm the population of associated species across their entire distribution area.
- Impacts arising from the concurrent presence of impact factors caused by the Project and other development projects; as an example, we can consider the emission of dust from the construction and the concurrent construction of a new infrastructure Project at the same location.

The process followed for the assessment is consistent with the framework provided by IFC and illustrated in the figure below, as described in the following paragraphs. Good Practice Handbook proposes as a useful preliminary

[12] Examples of cumulative impacts include: incremental contribution of gaseous emissions to an airshed; reduction of water flows in a watershed due to multiple withdrawals; increases in sediment loads to a watershed; interference with migratory routes or wildlife movement; or more traffic congestion and accidents due to increases in vehicular traffic on community roadways.

approach for developers in emerging markets the conduct of a rapid cumulative impact assessment (“RCIA”) which is illustrated below (Figure 21).

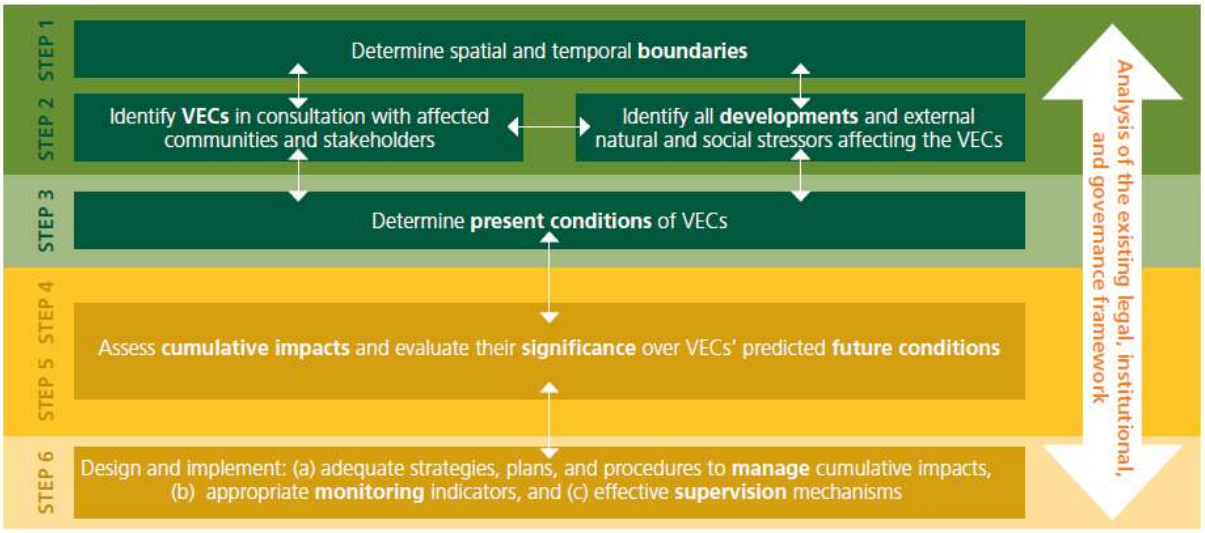



**Figure 21: RCIA: Six-Step Approach**

For the purposes of the present study, the cumulative impact assessment (“CIA”) is limited to those residual impacts (post mitigation) resulting from past projects (captured through the baseline investigations) and from future residual effects of present or reasonably foreseeable projects and activities.

The foreseeable projects that will supplement the Project with a third-party service or other independent projects proposed in the area were identified and described to be considered in the CIA. There must be a reasonable potential that the other projects’ impacts will overlap with those of the Project in time and/or space. If this overlap is not apparent, then a CIA is not warranted.

For cumulative effects to occur, residual impacts from the Project need to cumulate with residual impacts from other projects.

# 6.0 ENVIRONMENTAL AND SOCIAL BASELINE

## 6.1 Physical Components

### 6.1.1 Area of Influence

The area of influence (AoI) to be assessed may vary depending on the component itself and the characteristics of potentially affected receptors. In all cases, all areas where significant impacts are likely to occur are included in the AoI, and also project components are considered when identifying the AoI. These areas where significant impacts are likely to occur are defined as follows:

- The proposed Project footprint and access roads
- Project components
- Associated facilities

With regard to the main physical components: soil, hydrology, hydrogeology, air and noise, the AoI of the Project is defined in Table 33 below:

**Table 33: Physical Area of Influence**

| ESIA Component | AoI |
|---|---|
| Soil and Subsoil | AoI includes the Project footprint and temporary and associated facilities |
| Hydrology and Surface Water Quality | AoI includes the Project footprint and temporary and associated facilities |
| Hydrogeology and Groundwater Quality | AoI includes the Project footprint and temporary and associated facilities |
| Air Quality | AoI includes an area having boundaries a minimum of 2 km away from the Project Route, temporary and associated facilities |
| Noise and Vibration | AoI includes an area having boundaries 2 km away from the Project Route, temporary and associated facilities |

The terminology defined as Project Area in this section means the Project Route and temporary and associated facilities. The AoI of the Project is presented in Figure 22 below.

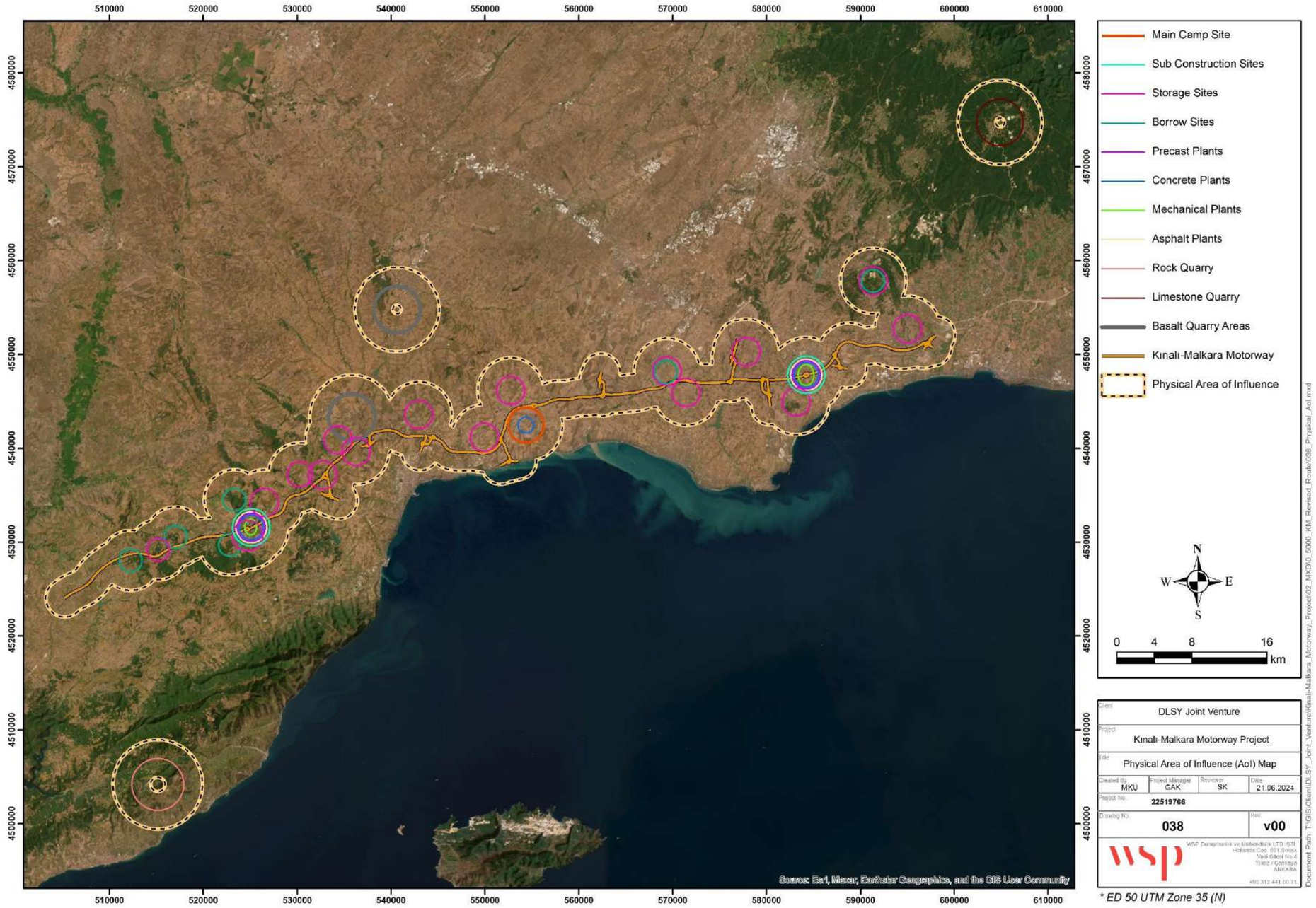



**Figure 22: Physical Components - Area of Influence of the Project[13]**

[13] The AoI boundaries shown on the map should be treated as representative. For each component, the zones were made according to the component whose AoI was determined as the widest. For example, considering the air and noise modelling studies for the physical component, a 2km buffer zone is represented in the map. For the full definition of AoIs, the explanations in the relevant sections should be taken into account.

### 6.1.2 Meteorology and Climatology

This section presents the baseline conditions for local and regional meteorology and climatology.

The AoI determined is close to the meteorological stations in Tekirdağ Province. In order to establish baseline conditions for meteorology and climatology, long term meteorological data recorded by the closest Meteorological Stations acquired from Turkish State Meteorological Service, have been used. The list of meteorological stations from which data is acquired is as follows:

- Tekirdağ Meteorological Station (located in Tekirdağ Province)
- Çorlu Airport Meteorological Station (located in Tekirdağ Province)
- Malkara Meteorological Station (located in Tekirdağ Province)

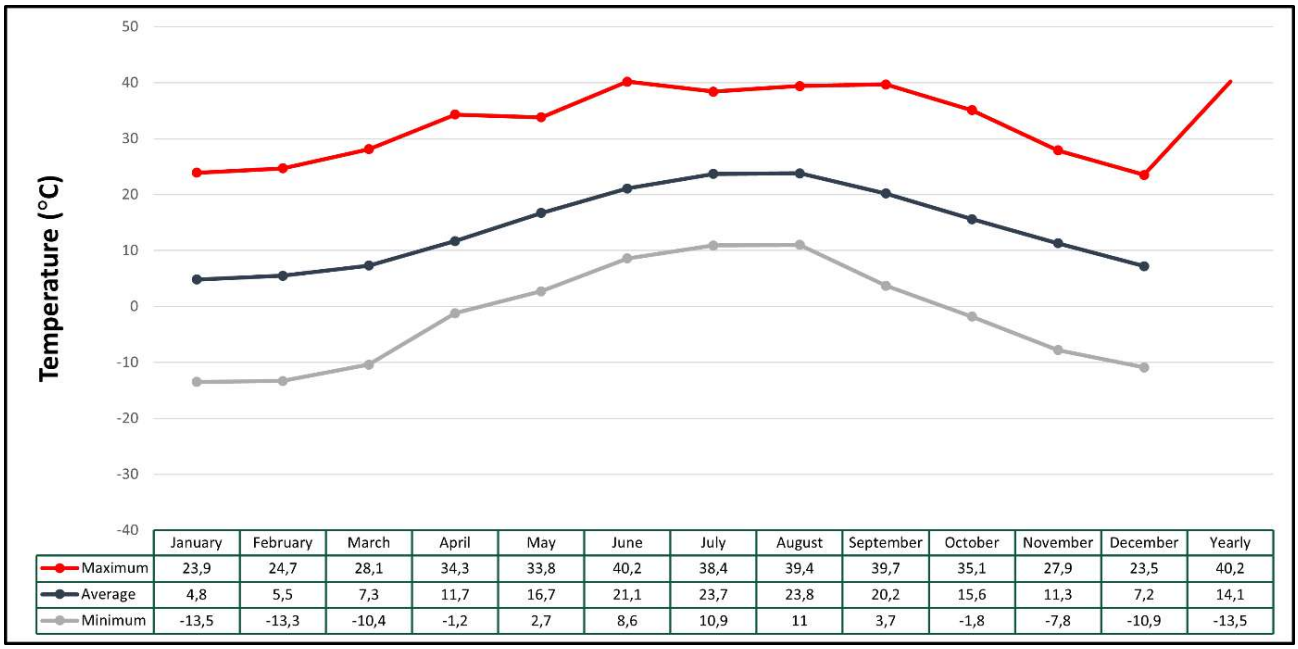
#### *6.1.2.1 Meteorological and Climatic Characteristics of Tekirdağ Province*

The province of Tekirdağ, located in the Marmara Region of Türkiye, has a moderate climate influenced by its coastal location on the Sea of Marmara. The meteorological characteristics of Tekirdağ are characterized by a mild and temperate climate, with an average annual temperature of 15°C. The summers are warm with temperatures up to an average of 25°C, while the winters are cool with an average temperature around 5°C. Precipitation in Tekirdağ is evenly distributed throughout the year, with an average annual precipitation of 680 millimetres. The months with the highest rain are December, January, and February, while the months with the lowest rain are July and August. The average relative humidity in Tekirdağ is around 70%, with the highest levels occurring in the summer months and the lowest levels in the winter months.

##### 6.1.2.1.1 Tekirdağ Meteorological Station

**Temperature**

Monthly average, absolute minimum and absolute maximum of long-term temperature data recorded in Tekirdağ Meteorological Station between the years 1940 and 2021, and the distribution graph are presented in Figure 23. According to these values, the average temperature varies between 4.8°C (observed in January) and 23.8°C (observed in August), and the annual average temperature is 14.1°C. The absolute minimum temperature was recorded in January 1942 as -13.5°C, and the absolute maximum temperature was recorded in June 2007 as 40.2°C. The temperature increases from January to August and decreases from August to December. The coldest months are December, January and February while the hottest are June, July and August.

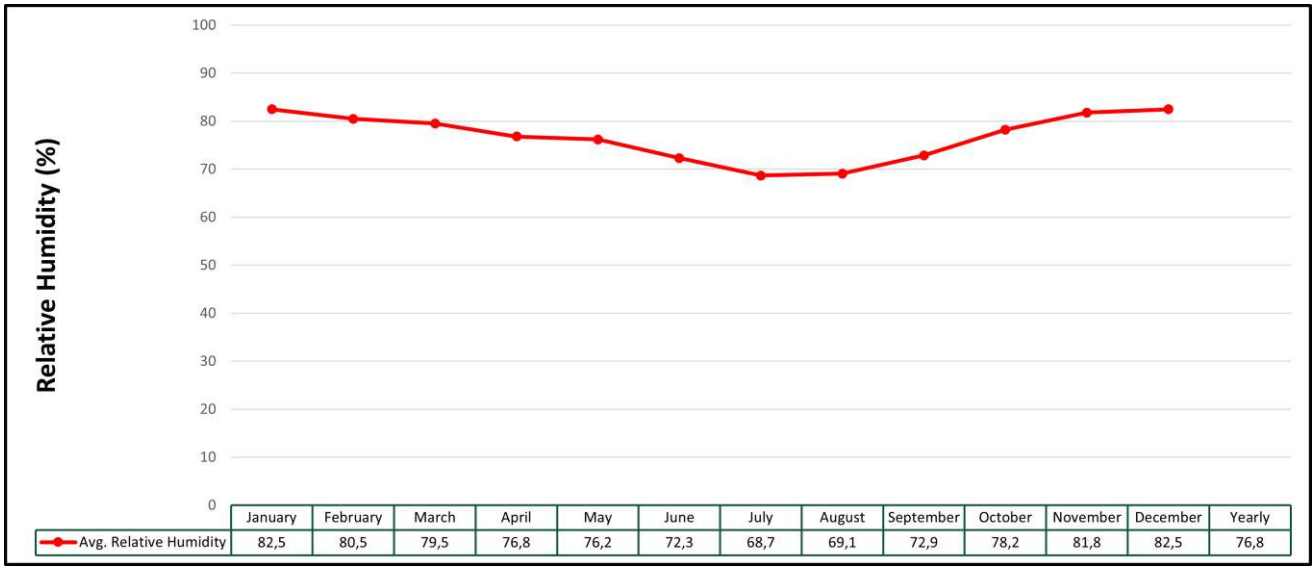



| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum | 23,9 | 24,7 | 28,1 | 34,3 | 33,8 | 40,2 | 38,4 | 39,4 | 39,7 | 35,1 | 27,9 | 23,5 | 40,2 |
| Average | 4,8 | 5,5 | 7,3 | 11,7 | 16,7 | 21,1 | 23,7 | 23,8 | 20,2 | 15,6 | 11,3 | 7,2 | 14,1 |
| Minimum | -13,5 | -13,3 | -10,4 | -1,2 | 2,7 | 8,6 | 10,9 | 11 | 3,7 | -1,8 | -7,8 | -10,9 | -13,5 |

**Figure 23: Temperature Distribution Graph for Tekirdağ Meteorological Station**

## Relative Humidity

Average, average maximum and average minimum relative humidity values recorded at Tekirdağ Meteorological Station between the years 1940 and 2021, and the monthly distribution are presented in Figure 24. According to the available information, annual average relative humidity is 76.8%. The minimum average relative humidity was observed as 68.7% in July and the maximum average as 82.5% in December and January.



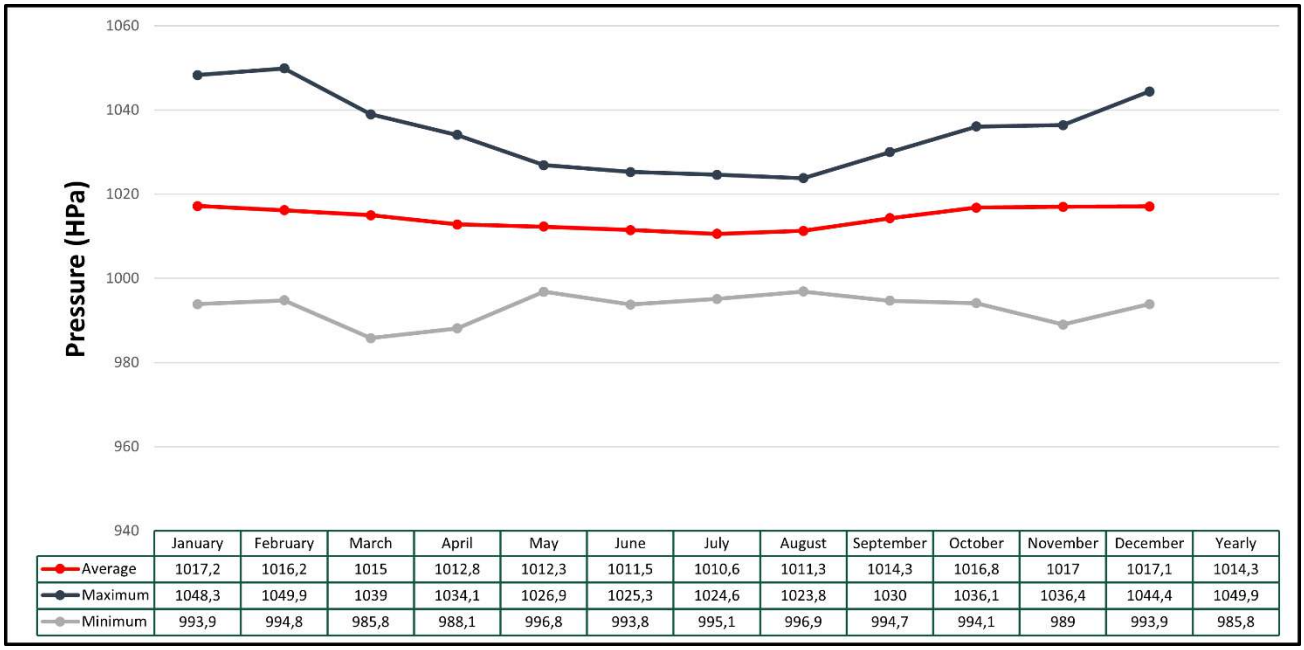

| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. Relative Humidity | 82,5 | 80,5 | 79,5 | 76,8 | 76,2 | 72,3 | 68,7 | 69,1 | 72,9 | 78,2 | 81,8 | 82,5 | 76,8 |

**Figure 24: Average Relative Humidity Recorded at Tekirdağ Meteorological Station**

## Local Pressure

Monthly average, absolute maximum and absolute minimum pressure recorded in Tekirdağ Meteorological Station between the years 1940 and 2021, and the distribution graph are presented in Figure 25. Annual average pressure recorded at Tekirdağ Meteorological Station is 1014.3 hPa. The absolute maximum pressure

was observed in February (1049.9 hPa), and the absolute minimum pressure was observed in March (985.8 hPa).




| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 1017,2 | 1016,2 | 1015 | 1012,8 | 1012,3 | 1011,5 | 1010,6 | 1011,3 | 1014,3 | 1016,8 | 1017 | 1017,1 | 1014,3 |
| Maximum | 1048,3 | 1049,9 | 1039 | 1034,1 | 1026,9 | 1025,3 | 1024,6 | 1023,8 | 1030 | 1036,1 | 1036,4 | 1044,4 | 1049,9 |
| Minimum | 993,9 | 994,8 | 985,8 | 988,1 | 996,8 | 993,8 | 995,1 | 996,9 | 994,7 | 994,1 | 989 | 993,9 | 985,8 |

**Figure 25: Pressure Values Recorded at Tekirdağ Meteorological Station**

## Wind Distribution

Number of wind blowing in terms of direction recorded in Tekirdağ Meteorological Station between the years 1940 and 2021 are presented in Table 34 and Table 35. The prevailing wind direction is determined as NW followed by WNW, and NE. Wind rose diagrams illustrating annual and seasonal wind distributions are presented in Figure 26.

**Table 34: Total Number of Monthly Wind Blowing in terms of Direction observed in Tekirdağ Meteorological Station**

| Direc. | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | 5866 | 5221 | 4492 | 3143 | 2584 | 3028 | 4807 | 5399 | 5058 | 5713 | 4884 | 5526 | 55721 |
| NNE | 5315 | 5693 | 6966 | 4296 | 3940 | 3944 | 6109 | 7426 | 6362 | 6459 | 4575 | 4912 | 65997 |
| NE | 5379 | 5023 | 6970 | 4763 | 4985 | 4686 | 7630 | 9564 | 7454 | 6472 | 4964 | 4475 | 72365 |
| ENE | 2035 | 2257 | 3530 | 3243 | 3015 | 2551 | 2152 | 2545 | 2251 | 1921 | 2097 | 1701 | 29298 |
| E | 1636 | 1852 | 2267 | 2843 | 3030 | 2151 | 2096 | 1941 | 1688 | 1857 | 1774 | 1588 | 24723 |
| ESE | 1201 | 1394 | 2299 | 2860 | 3463 | 2982 | 2290 | 1980 | 2151 | 1728 | 1513 | 1178 | 25039 |
| SE | 1717 | 1949 | 2966 | 4109 | 4983 | 4376 | 3713 | 3163 | 2995 | 2698 | 2120 | 1680 | 36469 |
| SSE | 1805 | 2105 | 2569 | 3365 | 4585 | 5016 | 4826 | 4345 | 3722 | 2612 | 2400 | 1924 | 39274 |
| S | 3026 | 2598 | 2070 | 2617 | 2731 | 2835 | 3211 | 2505 | 2110 | 2043 | 2766 | 3072 | 31584 |
| SSW | 1709 | 1731 | 1351 | 1491 | 971 | 607 | 244 | 214 | 458 | 778 | 1758 | 2448 | 13760 |
| SW | 2055 | 2194 | 2296 | 2063 | 1603 | 817 | 327 | 391 | 720 | 1460 | 1994 | 2634 | 18554 |
| WSW | 961 | 864 | 1037 | 1113 | 1083 | 704 | 458 | 352 | 591 | 813 | 1060 | 919 | 9955 |

| Direc. | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| W | 1639 | 1729 | 1747 | 1878 | 2044 | 1856 | 1302 | 1231 | 1325 | 1755 | 1987 | 1927 | 20420 |
| WNW | 7843 | 5141 | 5128 | 6147 | 6685 | 7882 | 6733 | 5673 | 6639 | 6942 | 7494 | 7449 | 79756 |
| NW | 9249 | 7016 | 6163 | 5255 | 5786 | 7191 | 7146 | 6854 | 7216 | 8498 | 8517 | 9513 | 88404 |
| NNW | 5074 | 3996 | 3857 | 2380 | 2257 | 2367 | 3101 | 3472 | 3953 | 4353 | 4492 | 4851 | 44153 |

**Table 35: Total Number of Seasonal Wind Blowing in terms of Direction observed in Tekirdağ Meteorological Station**

| Direction | Seasonal Wind Blows | | | | Total |
|---|---|---|---|---|---|
| | Winter | Spring | Summer | Autumn | |
| N | 16613 | 10219 | 13234 | 15655 | 55721 |
| NNE | 15920 | 15202 | 17479 | 17396 | 65997 |
| NE | 14877 | 16718 | 21880 | 18890 | 72365 |
| ENE | 5993 | 9788 | 7248 | 6269 | 29298 |
| E | 5076 | 8140 | 6188 | 5319 | 24723 |
| ESE | 3773 | 8622 | 7252 | 5392 | 25039 |
| SE | 5346 | 12058 | 11252 | 7813 | 36469 |
| SSE | 5834 | 10519 | 14187 | 8734 | 39274 |
| S | 8696 | 7418 | 8551 | 6919 | 31584 |
| SSW | 5888 | 3813 | 1065 | 2994 | 13760 |
| SW | 6883 | 5962 | 1535 | 4174 | 18554 |
| WSW | 2744 | 3233 | 1514 | 2464 | 9955 |
| W | 5295 | 5669 | 4389 | 5067 | 20420 |
| WNW | 20433 | 17960 | 20288 | 21075 | 79756 |
| NW | 25778 | 17204 | 21191 | 24231 | 88404 |
| NNW | 13921 | 8494 | 8940 | 12798 | 44153 |

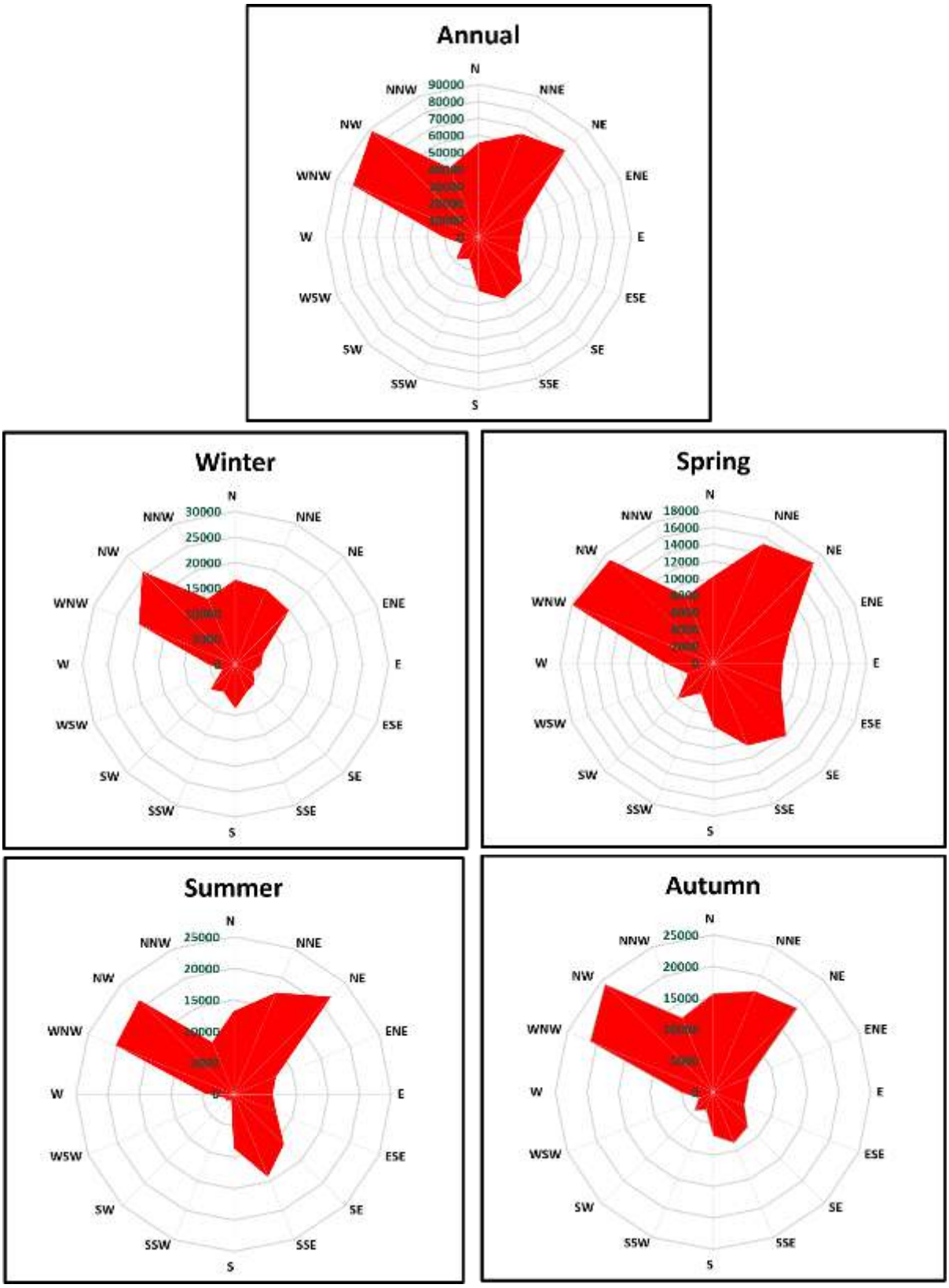
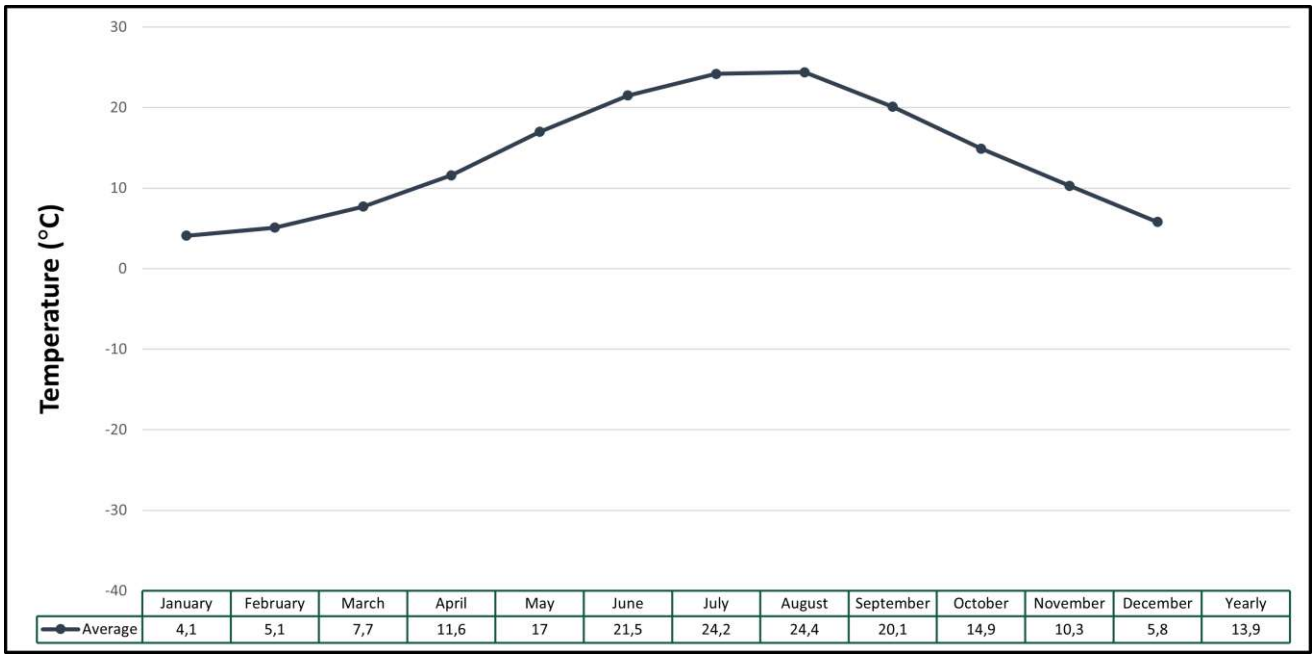



**Figure 26: Annual and Seasonal Wind Rose Diagrams for Tekirdağ Meteorological Station (According to Total Number of Wind Blowing)**

#### 6.1.2.1.2 Çorlu Airport Meteorological Station

### Temperature

Monthly average temperatures recorded in Çorlu Airport Meteorological Station between the years 2001 and 2021, and the distribution graph are presented in Figure 27. According to these values, the average temperature varies between 4.1°C (observed in January) and 24.4°C (observed in August), and the annual average temperature is 13.9°C. The temperature increases from January to August and decreases from August to December. The coldest months are December, January and February while the hottest are June, July and August.

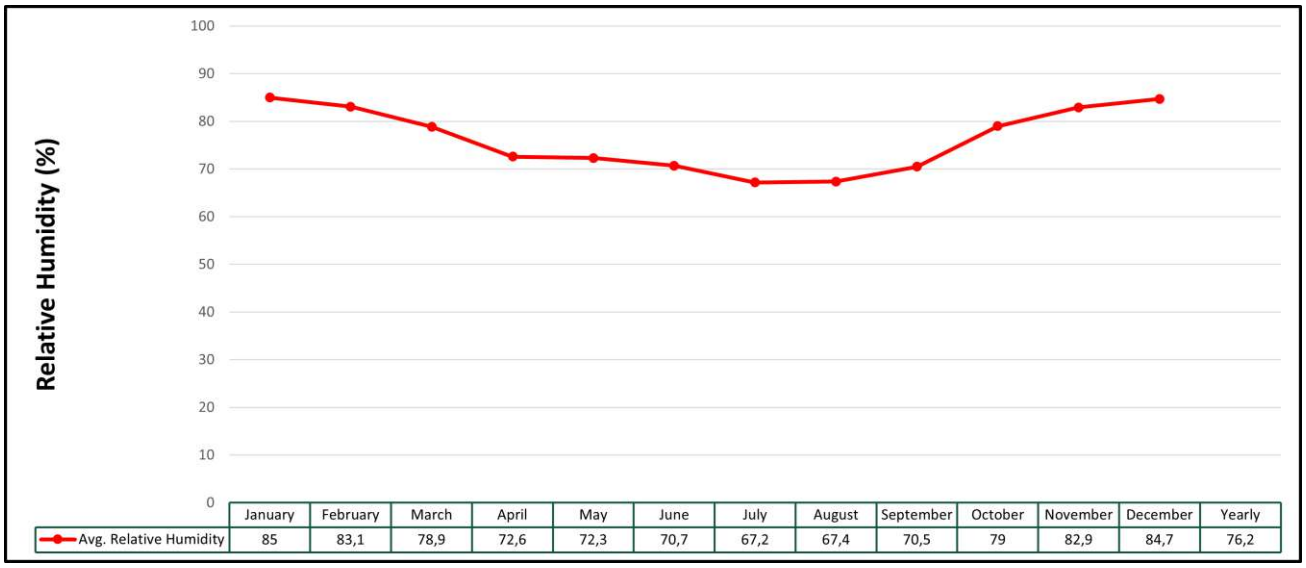



| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 4,1 | 5,1 | 7,7 | 11,6 | 17 | 21,5 | 24,2 | 24,4 | 20,1 | 14,9 | 10,3 | 5,8 | 13,9 |

**Figure 27: Temperature Distribution Graph for Çorlu Airport Meteorological Station**

### Relative Humidity

Average, average maximum and average minimum relative humidity values recorded at Çorlu Airport Meteorological Station between the years 2001 and 2021, and the monthly distribution are presented in Figure 28. According to the available information, annual average relative humidity is 76.2%. The minimum average relative humidity was observed as 67.2% in July and the maximum average as 85% in January.

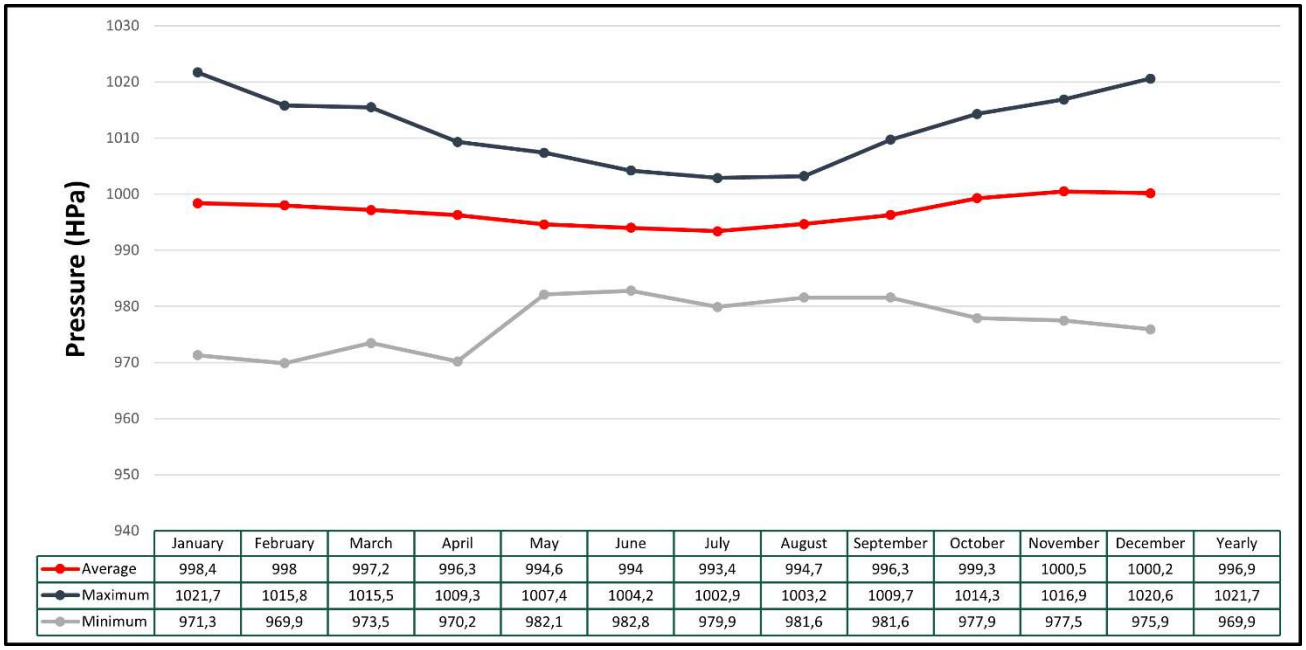



| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. Relative Humidity | 85 | 83,1 | 78,9 | 72,6 | 72,3 | 70,7 | 67,2 | 67,4 | 70,5 | 79 | 82,9 | 84,7 | 76,2 |

**Figure 28: Average Relative Humidity Recorded at Çorlu Airport Meteorological Station**

## Local Pressure

Monthly average, absolute maximum and absolute minimum pressure recorded in Çorlu Airport Meteorological Station between the years 2001 and 2021, and the distribution graph are presented in Figure 29. Annual average pressure recorded at Çorlu Airport Meteorological Station is 996.9 hPa. The absolute maximum pressure was observed as 1021.7 hPa, and the absolute minimum pressure was observed as 969.9 hPa.




| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 998,4 | 998 | 997,2 | 996,3 | 994,6 | 994 | 993,4 | 994,7 | 996,3 | 999,3 | 1000,5 | 1000,2 | 996,9 |
| Maximum | 1021,7 | 1015,8 | 1015,5 | 1009,3 | 1007,4 | 1004,2 | 1002,9 | 1003,2 | 1009,7 | 1014,3 | 1016,9 | 1020,6 | 1021,7 |
| Minimum | 971,3 | 969,9 | 973,5 | 970,2 | 982,1 | 982,8 | 979,9 | 981,6 | 981,6 | 977,9 | 977,5 | 975,9 | 969,9 |

**Figure 29: Pressure Values Recorded at Çorlu Airport Meteorological Station**

## Wind Distribution

Number of winds blowing in terms of direction recorded in Çorlu Airport Meteorological Station between the years 2001 and 2021 are presented in Table 36andTable 37. The prevailing wind direction is determined as NNE followed by N, and NE. Wind rose diagrams illustrating annual and seasonal wind distributions are presented in Figure 30.

**Table 36: Total Number of Monthly Wind Blowing in terms of Direction observed in Çorlu Airport Meteorological Station**

| Direc. | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | 1954 | 1858 | 1387 | 1245 | 1358 | 1836 | 2208 | 2847 | 1492 | 1634 | 1608 | 1471 | 20898 |
| NNE | 1232 | 1488 | 1502 | 1701 | 1714 | 2222 | 3245 | 3137 | 1921 | 1826 | 1574 | 1297 | 22859 |
| NE | 645 | 851 | 1162 | 1225 | 1235 | 1592 | 2252 | 2328 | 1518 | 1307 | 998 | 711 | 15824 |
| ENE | 263 | 329 | 374 | 400 | 462 | 422 | 534 | 572 | 454 | 319 | 311 | 322 | 4762 |
| E | 564 | 519 | 527 | 590 | 591 | 380 | 273 | 234 | 396 | 390 | 401 | 472 | 5337 |
| ESE | 359 | 335 | 306 | 358 | 377 | 190 | 125 | 98 | 142 | 175 | 247 | 299 | 3011 |
| SE | 342 | 358 | 343 | 363 | 384 | 217 | 152 | 100 | 181 | 161 | 242 | 297 | 3140 |
| SSE | 434 | 381 | 428 | 332 | 353 | 267 | 132 | 88 | 145 | 198 | 307 | 310 | 3375 |
| S | 692 | 730 | 796 | 634 | 637 | 392 | 137 | 126 | 261 | 403 | 598 | 675 | 6081 |
| SSW | 484 | 432 | 654 | 529 | 491 | 209 | 49 | 50 | 162 | 310 | 388 | 372 | 4130 |
| SW | 380 | 380 | 575 | 431 | 418 | 178 | 51 | 41 | 83 | 195 | 278 | 290 | 3300 |
| WSW | 319 | 285 | 384 | 325 | 391 | 194 | 63 | 42 | 93 | 186 | 249 | 255 | 2786 |
| W | 570 | 403 | 576 | 516 | 584 | 457 | 195 | 89 | 260 | 375 | 456 | 438 | 4919 |
| WNW | 472 | 197 | 350 | 302 | 337 | 353 | 275 | 115 | 239 | 321 | 275 | 395 | 3631 |
| NW | 471 | 207 | 272 | 304 | 282 | 339 | 278 | 240 | 294 | 224 | 268 | 487 | 3666 |
| NNW | 719 | 465 | 341 | 326 | 357 | 421 | 422 | 523 | 450 | 414 | 344 | 583 | 5365 |

**Table 37: Total Number of Seasonal Wind Blowing in terms of Direction observed in Çorlu Airport Meteorological Station**

| Direction | Seasonal Wind Blows | | | | Total |
|---|---|---|---|---|---|
| | Winter | Spring | Summer | Autumn | |
| N | 5283 | 3990 | 6891 | 4734 | 20898 |
| NNE | 4017 | 4917 | 8604 | 5321 | 22859 |
| NE | 2207 | 3622 | 6172 | 3823 | 15824 |
| ENE | 914 | 1236 | 1528 | 1084 | 4762 |
| E | 1555 | 1708 | 887 | 1187 | 5337 |
| ESE | 993 | 1041 | 413 | 564 | 3011 |
| SE | 997 | 1090 | 469 | 584 | 3140 |
| SSE | 1125 | 1113 | 487 | 650 | 3375 |
| S | 2097 | 2067 | 655 | 1262 | 6081 |
| SSW | 1288 | 1674 | 308 | 860 | 4130 |
| SW | 1050 | 1424 | 270 | 556 | 3300 |
| WSW | 859 | 1100 | 299 | 528 | 2786 |

| Direction | Seasonal Wind Blows | | | | Total |
|---|---|---|---|---|---|
| | Winter | Spring | Summer | Autumn | |
| W | 1411 | 1676 | 741 | 1091 | 4919 |
| WNW | 1064 | 989 | 743 | 835 | 3631 |
| NW | 1165 | 858 | 857 | 786 | 3666 |
| NNW | 1767 | 1024 | 1366 | 1208 | 5365 |

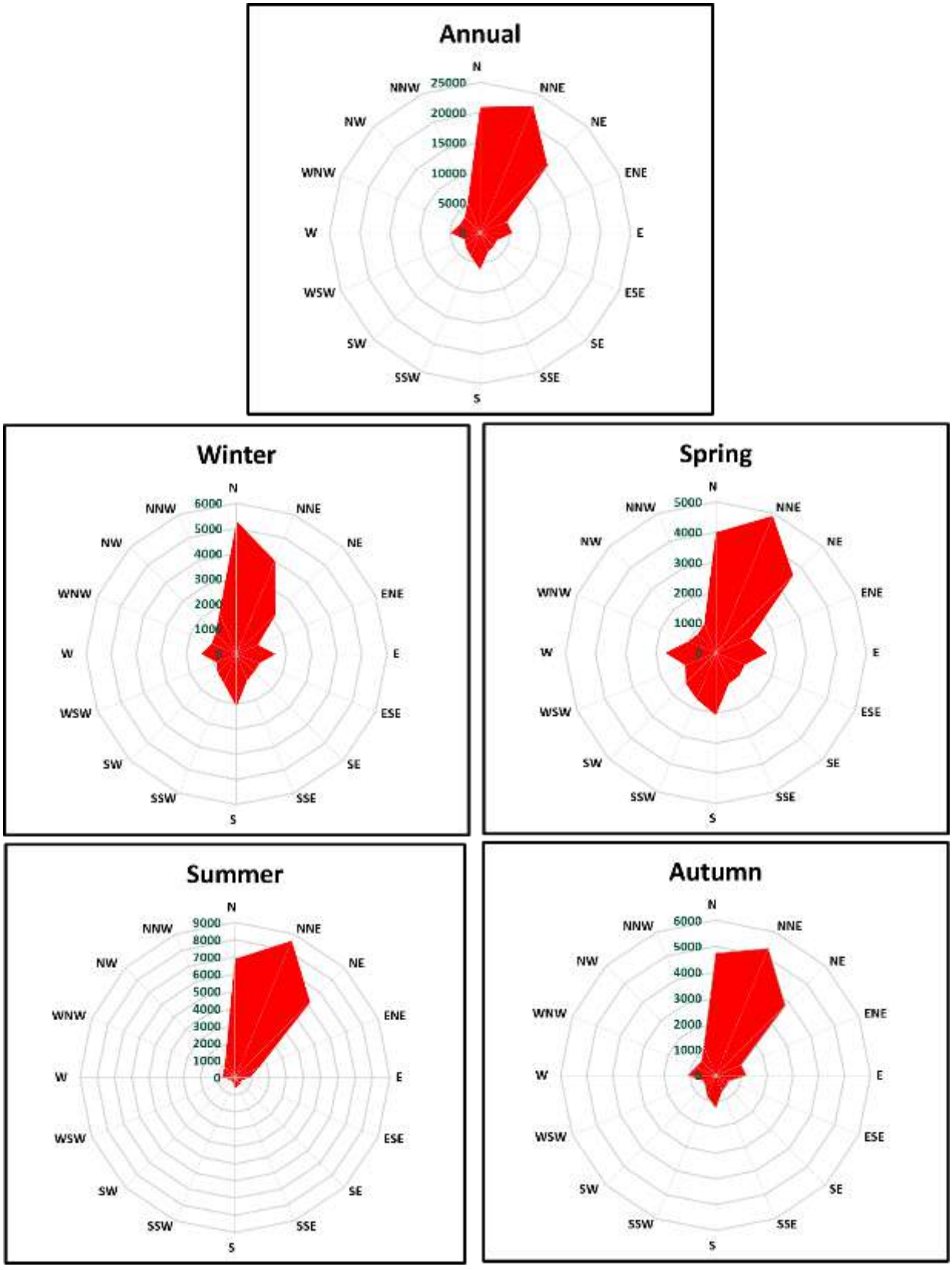
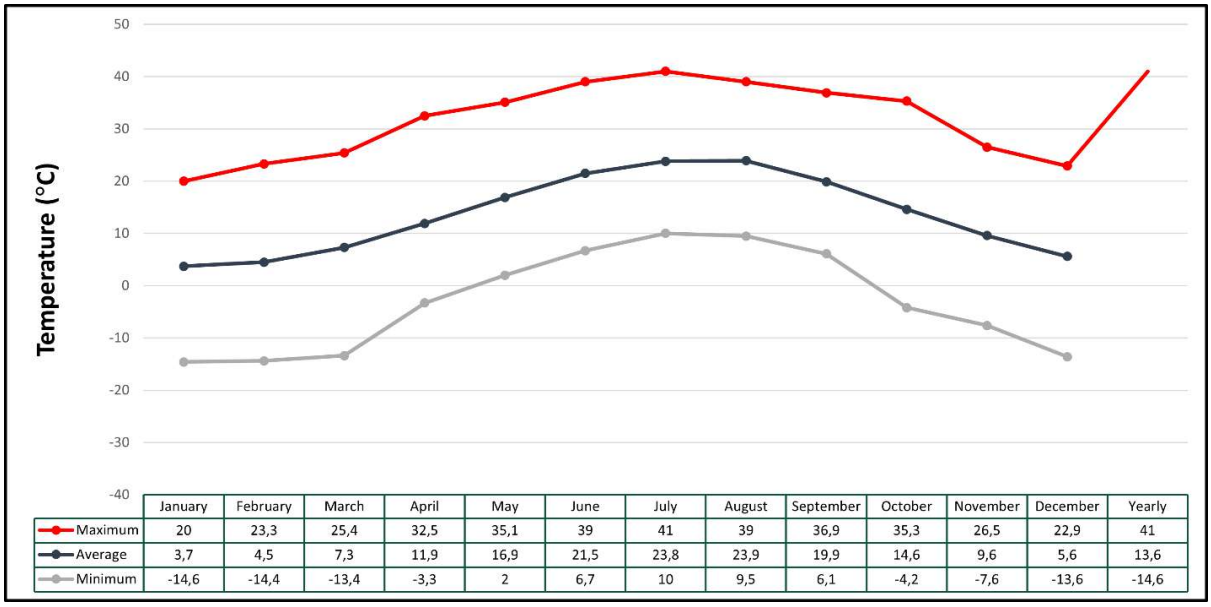



**Figure 30: Annual and Seasonal Wind Rose Diagrams for Çorlu Airport Meteorological Station (According to Total Number of Wind Blowing)**

#### 6.1.2.1.3 Malkara Meteorological Station

### Temperature

Monthly average, absolute minimum and absolute maximum temperatures recorded in Malkara Meteorological Station between the years 1980 and 2021, and the distribution graph are presented in Figure 31. According to these values, the average temperature varies between 3.7°C (observed in January) and 23.9°C (observed in August), and the annual average temperature is 13.6°C. The absolute minimum temperature was recorded in January 2017 as -14.6°C, and the absolute maximum temperature was recorded in July 2007 as 41°C. The temperature increases from January to July and decreases from July to December. The coldest months are December, January and February while the hottest are June, July and August.

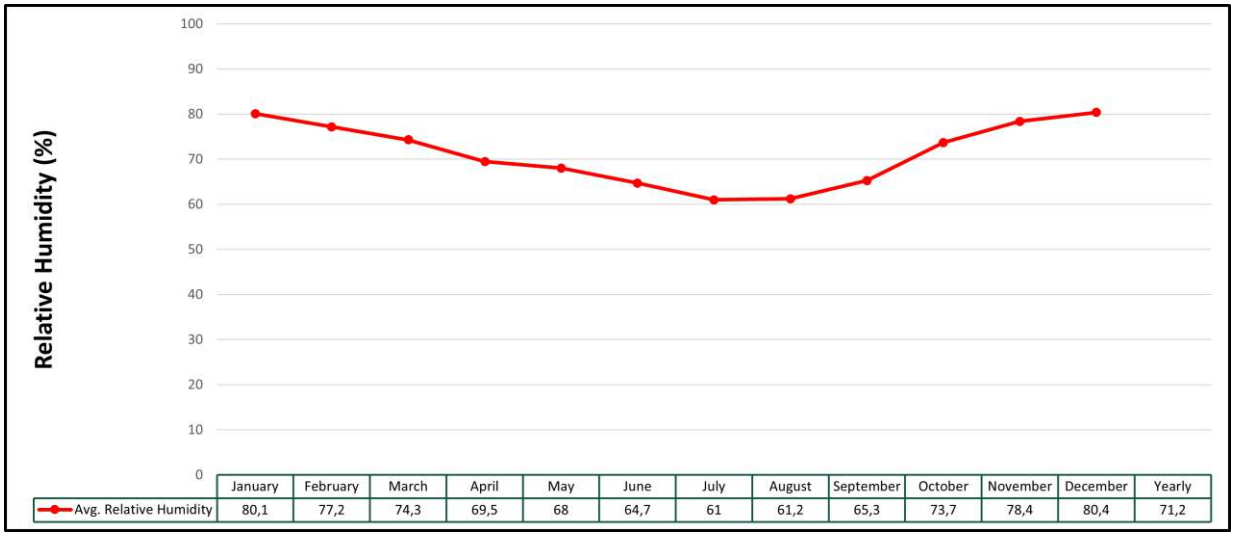



| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Maximum | 20 | 23,3 | 25,4 | 32,5 | 35,1 | 39 | 41 | 39 | 36,9 | 35,3 | 26,5 | 22,9 | 41 |
| Average | 3,7 | 4,5 | 7,3 | 11,9 | 16,9 | 21,5 | 23,8 | 23,9 | 19,9 | 14,6 | 9,6 | 5,6 | 13,6 |
| Minimum | -14,6 | -14,4 | -13,4 | -3,3 | 2 | 6,7 | 10 | 9,5 | 6,1 | -4,2 | -7,6 | -13,6 | -14,6 |

**Figure 31: Temperature Distribution Graph for Malkara Meteorological Station**

### Relative Humidity

Average, average maximum and average minimum relative humidity values recorded at Malkara Meteorological Station between the years 1980 and 2021, and the monthly distribution are presented in Figure 32. According to the available information, annual average relative humidity is 71.2%. The minimum average relative humidity was observed as 61% in July and the maximum average as 80.4% in December.

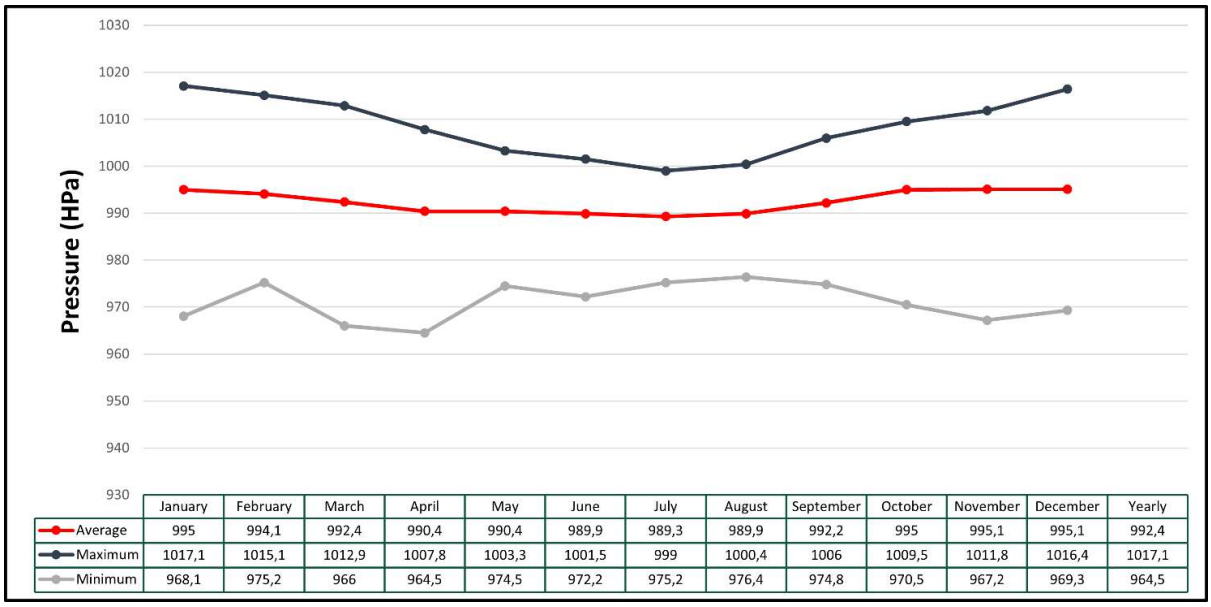



| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Avg. Relative Humidity | 80,1 | 77,2 | 74,3 | 69,5 | 68 | 64,7 | 61 | 61,2 | 65,3 | 73,7 | 78,4 | 80,4 | 71,2 |

**Figure 32: Average Relative Humidity Recorded at Malkara Meteorological Station**

## Local Pressure

Monthly average, absolute maximum and absolute minimum pressure recorded in Malkara Meteorological Station between the years 1980 and 2021, and the distribution graph are presented in Figure 33. Annual average pressure recorded at Malkara Meteorological Station is 992.4 hPa. The absolute maximum pressure was observed in January (1017.1 hPa), and the absolute minimum pressure was observed in April (964.5 hPa).




| | January | February | March | April | May | June | July | August | September | October | November | December | Yearly |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Average | 995 | 994,1 | 992,4 | 990,4 | 990,4 | 989,9 | 989,3 | 989,9 | 992,2 | 995 | 995,1 | 995,1 | 992,4 |
| Maximum | 1017,1 | 1015,1 | 1012,9 | 1007,8 | 1003,3 | 1001,5 | 999 | 1000,4 | 1006 | 1009,5 | 1011,8 | 1016,4 | 1017,1 |
| Minimum | 968,1 | 975,2 | 966 | 964,5 | 974,5 | 972,2 | 975,2 | 976,4 | 974,8 | 970,5 | 967,2 | 969,3 | 964,5 |

**Figure 33: Pressure Values Recorded at Malkara Meteorological Station**

## Wind Distribution

Number of winds blowing in terms of direction recorded in Malkara Meteorological Station between the years 1980 and 2021 are presented in Table 38 and Table 39. The prevailing wind direction is determined as NNE followed by NE. Wind rose diagrams for annual and seasonal wind distributions are presented in Figure 34.

**Table 38: Total Number of Monthly Wind Blowing in terms of Direction observed in Malkara Meteorological Station According to Directions**

| Direc. | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| N | 2762 | 2474 | 2244 | 1646 | 1976 | 2103 | 2445 | 2435 | 2160 | 2569 | 2065 | 2823 | 27702 |
| NNE | 8191 | 6734 | 6407 | 5195 | 6047 | 6393 | 10215 | 10767 | 9231 | 9510 | 7967 | 8144 | 94801 |
| NE | 3632 | 4102 | 4491 | 4393 | 4479 | 4462 | 6640 | 7311 | 5409 | 4846 | 4499 | 3834 | 58098 |
| ENE | 1147 | 1396 | 1824 | 1713 | 2140 | 2121 | 2858 | 2883 | 2203 | 1550 | 1349 | 1058 | 22242 |
| E | 470 | 417 | 474 | 652 | 738 | 715 | 793 | 720 | 603 | 502 | 451 | 426 | 6961 |
| ESE | 443 | 282 | 363 | 401 | 374 | 340 | 304 | 264 | 264 | 258 | 293 | 374 | 3960 |
| SE | 480 | 543 | 399 | 393 | 417 | 367 | 279 | 162 | 177 | 219 | 484 | 634 | 4554 |
| SSE | 489 | 519 | 415 | 558 | 437 | 452 | 270 | 169 | 307 | 259 | 485 | 717 | 5077 |
| S | 503 | 474 | 425 | 527 | 529 | 435 | 268 | 207 | 303 | 303 | 515 | 605 | 5094 |
| SSW | 1825 | 1732 | 2038 | 2038 | 1456 | 1257 | 593 | 372 | 1014 | 1280 | 1826 | 1899 | 17330 |
| SW | 3234 | 3060 | 3256 | 3276 | 3279 | 2440 | 1087 | 681 | 1471 | 2196 | 3082 | 3224 | 30286 |
| WSW | 3211 | 2931 | 4016 | 4600 | 4369 | 2593 | 1016 | 1086 | 2057 | 2963 | 3186 | 3209 | 35237 |
| W | 1366 | 1017 | 1507 | 1740 | 1699 | 1682 | 948 | 571 | 870 | 1004 | 918 | 1027 | 14349 |
| WNW | 217 | 197 | 354 | 481 | 376 | 538 | 411 | 279 | 475 | 219 | 248 | 191 | 3986 |
| NW | 536 | 354 | 521 | 508 | 533 | 760 | 503 | 281 | 426 | 321 | 294 | 314 | 5351 |
| NNW | 2040 | 1664 | 1760 | 1609 | 1789 | 2360 | 2194 | 1939 | 1956 | 2009 | 1810 | 2146 | 23276 |

**Table 39: Total Number of Seasonal Wind Blowing in terms of Direction observed in Malkara Meteorological Station According to Directions**

| Direction | Seasonal Wind Blows | | | | Total |
|---|---|---|---|---|---|
| | Winter | Spring | Summer | Autumn | |
| N | 8059 | 5866 | 6983 | 6794 | 27702 |
| NNE | 23069 | 17649 | 27375 | 26708 | 94801 |
| NE | 11568 | 13363 | 18413 | 14754 | 58098 |
| ENE | 3601 | 5677 | 7862 | 5102 | 22242 |
| E | 1313 | 1864 | 2228 | 1556 | 6961 |
| ESE | 1099 | 1138 | 908 | 815 | 3960 |
| SE | 1657 | 1209 | 808 | 880 | 4554 |
| SSE | 1725 | 1410 | 891 | 1051 | 5077 |
| S | 1582 | 1481 | 910 | 1121 | 5094 |
| SSW | 5456 | 5532 | 2222 | 4120 | 17330 |
| SW | 9518 | 9811 | 4208 | 6749 | 30286 |
| WSW | 9351 | 12985 | 4695 | 8206 | 35237 |
| W | 3410 | 4946 | 3201 | 2792 | 14349 |

| Direction | Seasonal Wind Blows | | | | Total |
|---|---|---|---|---|---|
| | Winter | Spring | Summer | Autumn | |
| WNW | 605 | 1211 | 1228 | 942 | 3986 |
| NW | 1204 | 1562 | 1544 | 1041 | 5351 |
| NNW | 5850 | 5158 | 6493 | 5775 | 23276 |

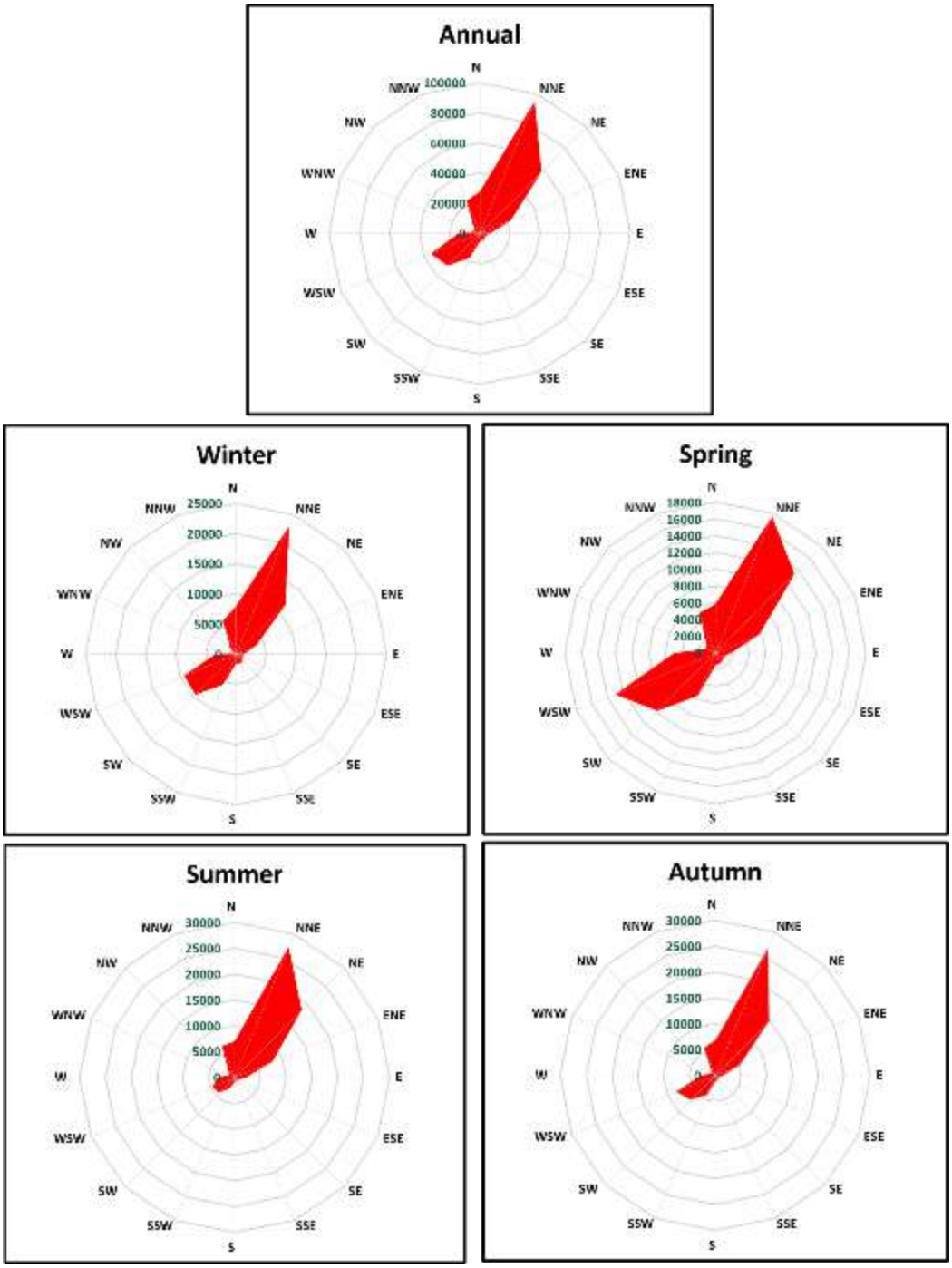



**Figure 34: Annual and Seasonal Wind Rose Diagrams for Malkara Meteorological Station (According to Total Number of Wind Blowing)**

### 6.1.3 Geology and Geomorphology

#### *6.1.3.1 Regional Geology*

Tekirdağ is a province located in the north-western part of Türkiye. It has a diverse geological history, characterized by a variety of rock formations, tectonic events, and erosional processes. The region is situated on the Thrace Basin, which is a large, relatively flat area composed of various sedimentary rocks.

The oldest rocks in the Tekirdağ area are the Paleozoic-aged metamorphic rocks, which are mainly composed of schists, gneisses, and quartzites. These rocks were formed through the metamorphism of ancient marine sediments and volcanic rocks. They are exposed in the eastern part of the province and are also found in the vicinity of the Marmara Sea.

The Mesozoic era in Tekirdağ is represented by sedimentary rocks such as sandstones, limestones, and shales. These rocks were deposited during the Jurassic and Cretaceous periods, when the region was covered by a shallow sea. Fossils of marine organisms, such as ammonites, bivalves, and gastropods, can be found in these rocks. They are mainly exposed in the northern and central parts of the province.

In the western part of the province, the Cenozoic rocks are divided into two main groups: the Thrace Basin and the Marmara Basin. The Thrace Basin is in the north-western part of Tekirdağ, and it consists mainly of sandstone, shale, and limestone, which were deposited during the Paleocene to Eocene periods, around 60 million years ago. The Marmara Basin, on the other hand, is in the southwestern part of Tekirdağ and is characterized by a sequence of marine sedimentary rocks that were deposited during the late Oligocene to the early Miocene periods, around 25-30 million years ago. The most recent geological formations in Tekirdağ are the Quaternary deposits, which are found in the coastal plains and river valleys. These deposits consist of alluvial and fluvial sediments, which were deposited by rivers and streams during the Quaternary period, between 2.6 million and 11,700 years ago.

In summary, the geology of Tekirdağ is characterized by a complex history of tectonic activity, erosion, and sedimentation. The province has a diverse range of rock formations that record the evolution of the region over millions of years. The rocks provide valuable insights into the geological processes that have shaped the landscape of this part of Türkiye. The generalized stratigraphic section of Tekirdağ and its surroundings is presented in Figure 35.

| PERIOD | EPOCH | FORMATION | THICKNESS (m) | LITHOLOGY | EXPLANATION | SEDIMENTARY DEPOSIT |
|---|---|---|---|---|---|---|
| QUATERNARY | | ALLUVIUM | | | Sand, silt, clay | |
| | | | | | Unconformity | |
| TERTIARY | PLIOCENE | TRAKYA (THRACE) | 50 | | Gravelstone, Sandstone | Streams and alluvial fans |
| | | | | | Unconformity | |
| | MIOCENE | ERGENE (EVROS) | 100 - 500 | | Sandstone, claystone and siltstone | Streams and brakish lake |
| | | ÇEKMECE | 100-200 | | Mudstone, sandstone, marn and limestone | Streams and lake |
| | | | | | Unconformity | |
| | | ÇANAKKALE | 40-100 | | Siltstone, sandstone and claystone | Streams, lake, lagoon, coastal and littoral |
| | | | | | Unconformity | |
| | | HİSARLIDAĞ VOLCANITES | ? | | Tuff and agglomerate | Kaletepe eruption (?) |
| | OLIGOCENE | DANİŞMEN | 200 - 600 | | Grayish Green Sandstone, Siltstone, Claystone, Gravelstone, Tuff, Lignite and their weathering products | Stream |
| | | | | | | Delta marsh |
| | | | | | | Delta |
| | | OSMANCIK | 300-600 | | Sandstone and Shale with gravelstone, limestone and thin lignite bands | Delta, streams and lake |
| | | MEZARDERE | 500-1200 | | Greenish gray shale, marn and tuff | Delta and coast |
| | EOCENE | CEYLAN | 400-1000 | | Gray marn with tuff bands, shale, sandstone and clayey limestone | Off-shore and turbiditic |
| | | SOĞUCAK | 40-300 | | Gray-beige micrite limestone | Shelf and Palaeo-continental rise |
| | | KEŞAN | 500-1500 | | Sandstone, Marn and Shale | Stream-Lake, delta and turbiditic (littoral-neritic) |
| | | GAZİKÖY | 600-1000 | | Dark gray-black shale and sandstone | Turbiditic and oceanic |

**Figure 35: Generalized Stratigraphic Section of Tekirdağ and Its Surroundings**[14]

## Geomorphology

The geomorphology of Tekirdağ is characterized by a diverse range of landforms, shaped by a combination of tectonic, erosional, and depositional processes.

The region is situated on the Thrace Basin, which is a geologically complex area formed by the collision of several tectonic plates. As a result, the area is characterized by a complex pattern of faults and folds, with a variety of rock types exposed at the surface.

One of the most prominent landforms in Tekirdağ is the Ganos Mountains, which extend from the north-western part of the province towards the southeast. The mountains are composed of a variety of rock types, including limestone, sandstone, and shale. The slopes of the mountains are characterized by steep gradients, with numerous valleys and gorges cut by streams and rivers.

To the north of the Ganos Mountains, the landscape is characterized by a series of low hills and plateaus, formed by the deposition of sedimentary rocks over millions of years. The hills are covered

[14] Şengüler, İ. (2013). Geology and Coal Potential of the Ergene (Evros) Basin. Ankara: TPAO.

by a mixture of forests, farmland, and grassland, with numerous small streams and rivers flowing through the area.

The southern part of the province is dominated by the Ergene River, which flows from west to east, and empties into the Sea of Marmara. The river has formed a wide floodplain, with numerous channels and braided streams, which are subject to frequent flooding.

Along the coast, the landscape is characterized by a series of sandy beaches and dunes, formed by the accumulation of sediment transported by longshore drift. The coastline is also characterized by a series of rocky headlands and cliffs, formed by erosion of the underlying rock.

Overall, the geomorphology of Tekirdağ is complex and diverse, reflecting the complex geology and tectonic history of the region. The province's varied landscapes offer numerous opportunities for outdoor recreation and tourism, as well as supporting a range of agricultural activities.

#### *6.1.3.2 Local Geology*

In this section, geological information about the project route and its surroundings is given. While evaluating this information, the geological and geotechnical survey report of the Kınalı-Tekirdağ-Çanakkale Motorway was used.

As a result of the geological studies carried out on the project route and its immediate surroundings, units belonging to six (6) different formations were observed. These; Eocene aged Korudağ formation (Tko), Keşan formation (Tko), Oligocene aged Danişmen formation (Tod), Çakıl formation (Olc) and upper Miocene aged Çanakkale formation, which belong to the Çamrakdere member. All these units are unconformably overlain by alluvial units.

**Korudağ Formation**

The Korudağ formation consists of alternations of thick-bedded sandstones and thin-bedded claystones. In this alternation, a lens-shaped loose-medium tightly attached conglomerate is observed. The upper levels of the formation decomposed into sandy - argillaceous. The sandstones are generally yellowish brown, yellowish green in colour and are thick-medium bedded. Claystones are yellowish brown in colour and thinly bedded. Weathering is quite common in the upper levels of the claystones, and 4-5 m clay-sand levels are observed.

According to Kellog, 1973[15], the Korudağ Formation is a separate unit; however, many studies, such as Mineral Research and Exploration[16], define it as a sub-unit of Keşan Formation.

**Keşan Formation**

This formation consists of alternations of sandstone and claystone and lens-shaped conglomerates and volcanics between them. Along the route, sandstone and claystone weathered levels are generally observed. The sandstones are light brown, yellow, and greenish grey in colour and are thin-medium bedded. Claystones are light brown in colour and thinly bedded. The formation is of Upper Eocene age.

Holmes (1961)[17] defined the Kumbağ Formation as Keşan Formation as Gaziköy Formation.

[15] Kellog, H.E., 1973, Geology and Petrolium Prospects Gulf of Saros and Vicinity Southwestern Thrace, Ashland Oil of Turkey, Inc., TPAO Archive of Exploration (unpublished), Report No. 902, Ankara.

[16] Mineral Research and Exploration, Litostratigraphic Units of the Thrace Region, 2006

[17] Holmes, A.W. 1961. A stratigraphic review of Thrace: TPAO Archive No; 368.

**Danişmen Formation**

The Danişmen Formation consists of sandstones and marls containing claystone - siltstone levels and lignites. The formation occurred in the delta plain and fluvial environments. Along the route, sand, clay, silt and gravel levels are observed from place to place.

**Çakıl Formation**

Çakıl Formation in general; consists of yellowish brown, carbonate cemented, gneiss, granite, schist, radiolarite, quartzite, limestone and conglomerate containing volcanic rock fragments, and yellowish white sandstone and greenish claystone. Its thickness is between 50-100 m. The formation is observed along the route as more weathered levels, generally greyish yellow colored gravel and yellowish-brown sand and clay units.

Çakıl Formation was defined by N.V. Turkse Shell[18] for the first time in 1969 as Armutburnu Formation. Due to the conformity between the Danişmen Formation, Çakıl Formation can be considered as a member of the Danişmen Formation.

**Çamrakdere Member**

It consists of claystone, siltstone, sandstone and conglomerate. While sandstone-marl-claystone levels are observed along the route, conglomerate levels are rarely exposed. On the surface, there are decomposed products of the formation under the vegetative soil cover varying in thickness from about 30-80 cm. Sandstone, mam claystone, intercalation, grey, greenish grey, yellowish brown, conglomerates are generally grey in color. Claystones contain abundant fossils. The age of the formation is Upper Miocene.

Çamrakdere Formation is a member of the Çanakkale Formation, which can be named as Kirazlı Formation according to Şentürk and Karaköse (1998)[19].

**Alluvium (Qal)**

Clay, silt, sand, and gravel deposits developed on riverbeds, old depressions and coastal plains. Generally, alluviums along the route are represented by clay silt-sand. However, pebbly levels are also observed.

The generalized stratigraphic section of the Project Route is presented in Figure 36.

[18] N.V. Turkse Shell, 1969, Termination report for exploration licences AR/NTS/837, 838 and 839, TPAO Exploration Department Archive, technical report no:1468

[19] Şentürk, K. and Karaköse, C., 1998, 1:100 000 scaled geological maps of Turkey, Çanakkale-D2 Map, No: 62. Mineral Research and Exploration, Ankara.

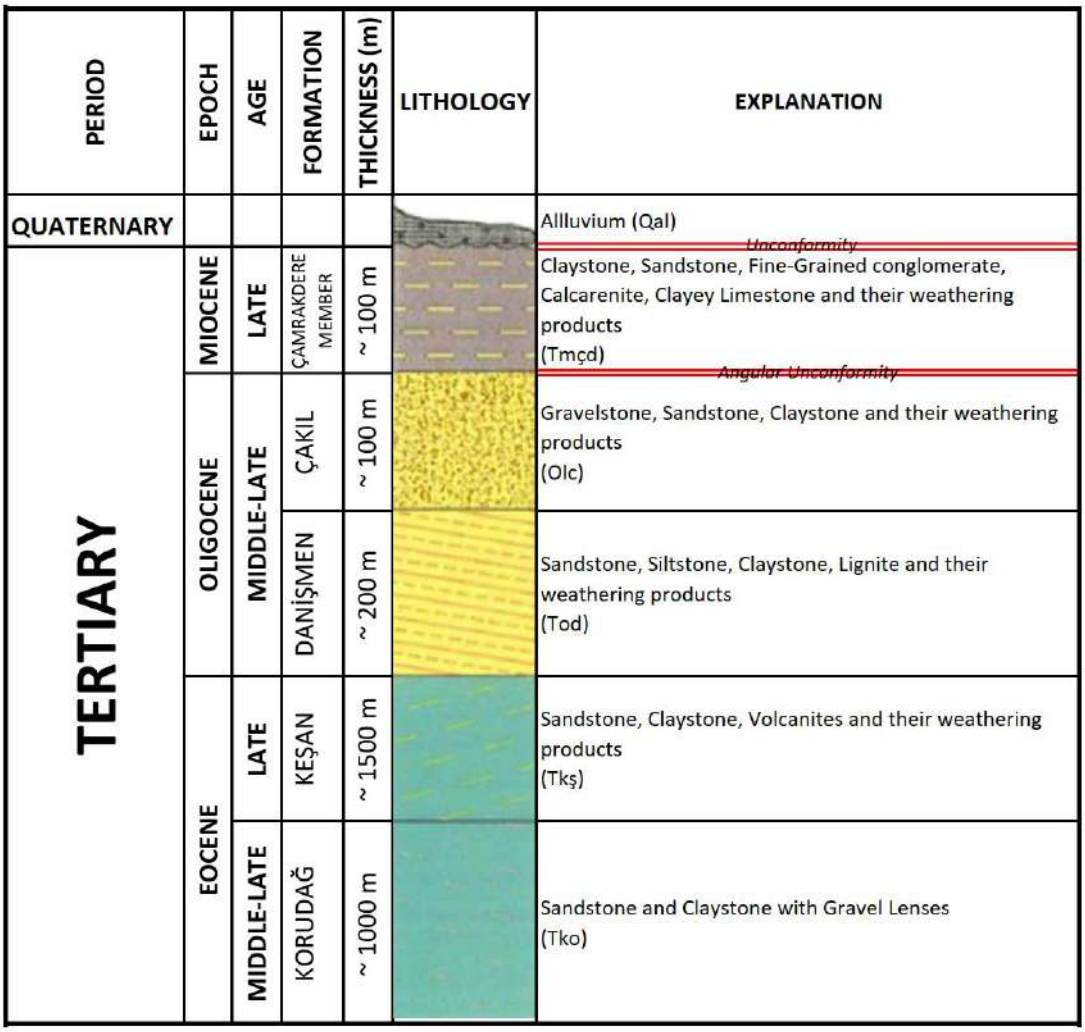



**Figure 36: Generalized Stratigraphic Section of the Project Route and Its Surroundings[20]**

### 6.1.3.3 Structural Geology

The Anatolian Peninsula is characterized by a mosaic-like structure, composed of continental tectonic units and the faults that divide them. The convergence of the Eurasian plates, which began in the Late Cretaceous period, led to the closure of the oceanic basins, known as Tethys, and the accumulation of continental fragments. This process resulted in the formation of the modern-day Anatolian crust, shaped by the positioning of subduction and accretionary prisms, and ophiolites that contributed to the structure's formation (Şengör and Yılmaz, 1981[21]; Yiğitbaş et al., 1999[22]). As per Okay and Tüysüz (1999)[23], the tectonic units of Turkey comprise the Rhodope-Istranca Zone, Istanbul Zone, Sakarya Zone, Kırşehir Massif, Tauride-Anatolide Block (including the Tavşanlı Zone, Afyon Zone, Bornava Flysch Zone, Menderes Massif) and the Arabian Platform (Figure 37).

[20] Geological and Geotechnical Survey Report of the Kınalı-Tekirdağ-Çanakkale Motorway, General Directorate of Highways, 1st Division Directorate, 2013.

[21] Şengör and Yılmaz, 1981, Tethyan Evolution Of Turkey: A Plate Tectonic Approach, Tectonophysics, Volume 75, Issues 3–4, 1 June 1981, Pages 181-190, 193-199, 203-241

[22] Yigitbas, Erdinc & Elmas, Ali & Yilmaz, Yücel. (1999). Pre-Cenozoic tectono-stratigraphic components of the Western Pontides and their geological evolution. Geological Journal - GEOL J. 34. 55-74.

[23] Okay, Aral & Tuysuz, Okan. (1999). Tethyan Sutures of northern Turkey. Geological Society London Special Publications. 156. 475-515.

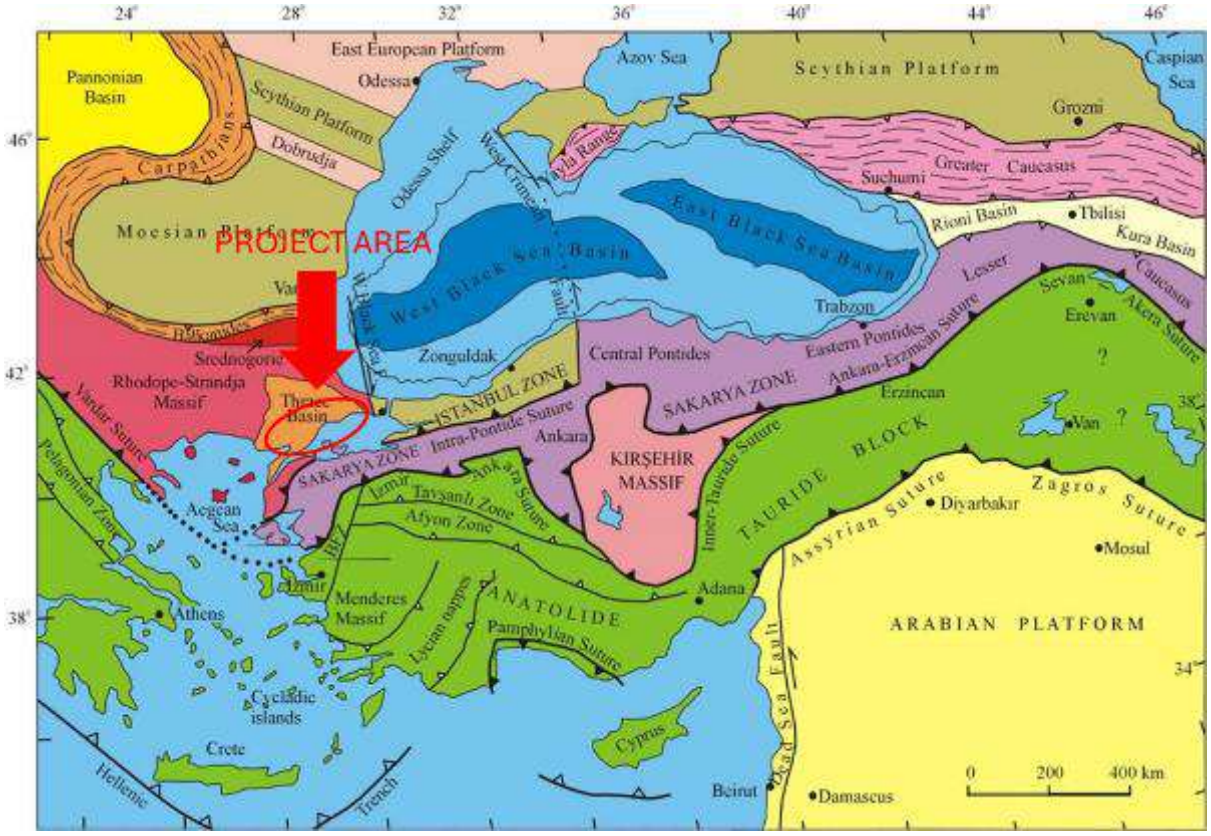



**Figure 37: Tectonic Structure of Türkiye and Project Location (Modified from Okay and Tüysüz, 1999)**

One or two earthquakes with a magnitude of 7.2-7.4 are likely to occur in the Marmara Sea within the next 30 years, and an earthquake with a magnitude of 8 or greater is possible within the next 100 years (Hubert-Ferrari et al. 2000[24], Altinok et al., 2001[25]). Faults that may cause earthquakes in the study area (study area of the geotechnical report) are the Saroz-Gaziköy fault and the fault segments located on the edge of the depressions in the Marmara Sea. The western extension of the 1200 km long North Anatolian Fault reaches the Gulf of Saros through the Marmara Sea. The Saroz-Gaziköy fault is an approximately 50 km long, dextral strike-slip fault that passes through settlements such as Kavak, Yeniköy, Gölcük, Yayaköy, Güzelköy, and Gaziköy. This fault, which has caused many earthquakes in historical times, last caused a 7.4 magnitude earthquake on 12.08.1912. Therefore, it can be said that the Saroz-Gaziköy fault in the region can cause earthquakes of magnitude 7.0-7.5. Weak soils, with characteristics such as the lithological structure of alluvial-like or loosely consolidated units (20 m or thicker) play a role in increasing the intensity of large earthquakes. In the study area, in addition to the villages mentioned above, the Şarköy district, Mürefte Town, part of Tekirdağ city, and Marmara Ereğlisi are established on units with weak ground characteristics.

The basin descends from the northern part to the south along significant east-west faults. Additionally, many north-south faults have developed in the area. All these faults cut through the basin floor and the Tertiary to Oligocene series but do not reach the Miocene series. In other words, the movements

[24] Hubert-Ferrari, Aurélia & Barka, Aykut & Jacques, Eric & Nalbant, Suleyman & Meyer, Bertrand & Armijo, Rolando & Tapponnier, P. & King, Geoffrey. (2000). Seismic hazard in the Marmara Sea region following the 17 August 1999 Izmit earthquake. Nature. 404.

[25] Altınok, Yıldız & Ersoy, Şükrü & Yalciner, Ahmet & Alpar, Bedri & Kuran, Ugur. (2014). Historical tsunamis in the Sea of Marmara-altınok vd 2001.

stopped before the Miocene. A ridge bounded by longitudinal faults extends between Silivri and Tekirdağ, to the Marmara Sea. Significant tectonic depressions have formed on both sides of the ridge. In the southwestern part of the basin, an important NW-SE directional fault strip extends approximately along the Tekirdağ-Uzunköprü line, which is around 12 kilometres away from the Project Route (Figure 38). It is estimated that the basin is quite shallow in the southern area of this line. The structures that have been detected and are expected in the Thrace Basin must consist of fault blocks and buried (morphological) basement elevations, partially surrounded by reverse-slope faults, rather than structures of orogenic origin.

### 6.1.4 Geohazard and Seismology

As discussed in the Section 6.1.3.3, The Project Area is located in a region where major earthquakes can occur. For this reason, earthquake is considered as the most important geohazard.

The first Earthquake Zoning Map of Türkiye was prepared by the Ministry of Public Works and Settlement considering the latest knowledge, approved by the Government of Türkiye and published in 1996. This Map was revised in 2018 and the latest Türkiye Earthquake Hazard Map is prepared by Disaster & Emergency Management Authority, Presidential of Earthquake Department and published in the 30364 numbered Official Gazette on March 8th, 2018.

In the new map, unlike the previous map, the maximum ground acceleration values are shown instead of earthquake zones and the concept of “earthquake zone” is eliminated. “Türkiye Building Earthquake Regulation (Official Gazette Date: 18.03.2018 Number: 30364)" refers to this map for the calculation of acceleration values that will affect the construction.

According to AFAD, the maximum peak ground acceleration (PGA) value near the Project Area with 475 years return period is defined as approximately 0.309 g. The PGA values for the Physical AoI are presented in Figure 39.

According to the national landslide maps prepared by the Mineral Research and Exploration in 2005, there are many landslides, paleo-landslides and soft clay movement around the Project Route (Figure 40). According to the 1/25,000 scaled maps, general lateral movements have been detected near the 40th-kilometre access road[26], and active landslide areas near the 70th-kilometre access road[27] (Figure 41, Figure 42).

[26] Duman, T.Y., Nefeslioğlu, H.A., Çan, T., Ateş, Ş., Durmaz, S., Olgun, Ş., Hamzaçebi, S. and Keçer. M., 2006, 1/25,000 Scaled Digital Landslide Maps, Parcel No. F-19-d3, Turkey Geological Database, Mineral Research and Exploration, Ankara.

[27] Duman, T.Y., Nefeslioğlu, H.A., Çan, T., Ateş, Ş., Durmaz, S., Olgun, Ş., Hamzaçebi, S. and Keçer. M., 2006, 1/25,000 Scaled Digital Landslide Maps, Parcel No. F-18-c3, Turkey Geological Database, Mineral Research and Exploration, Ankara.

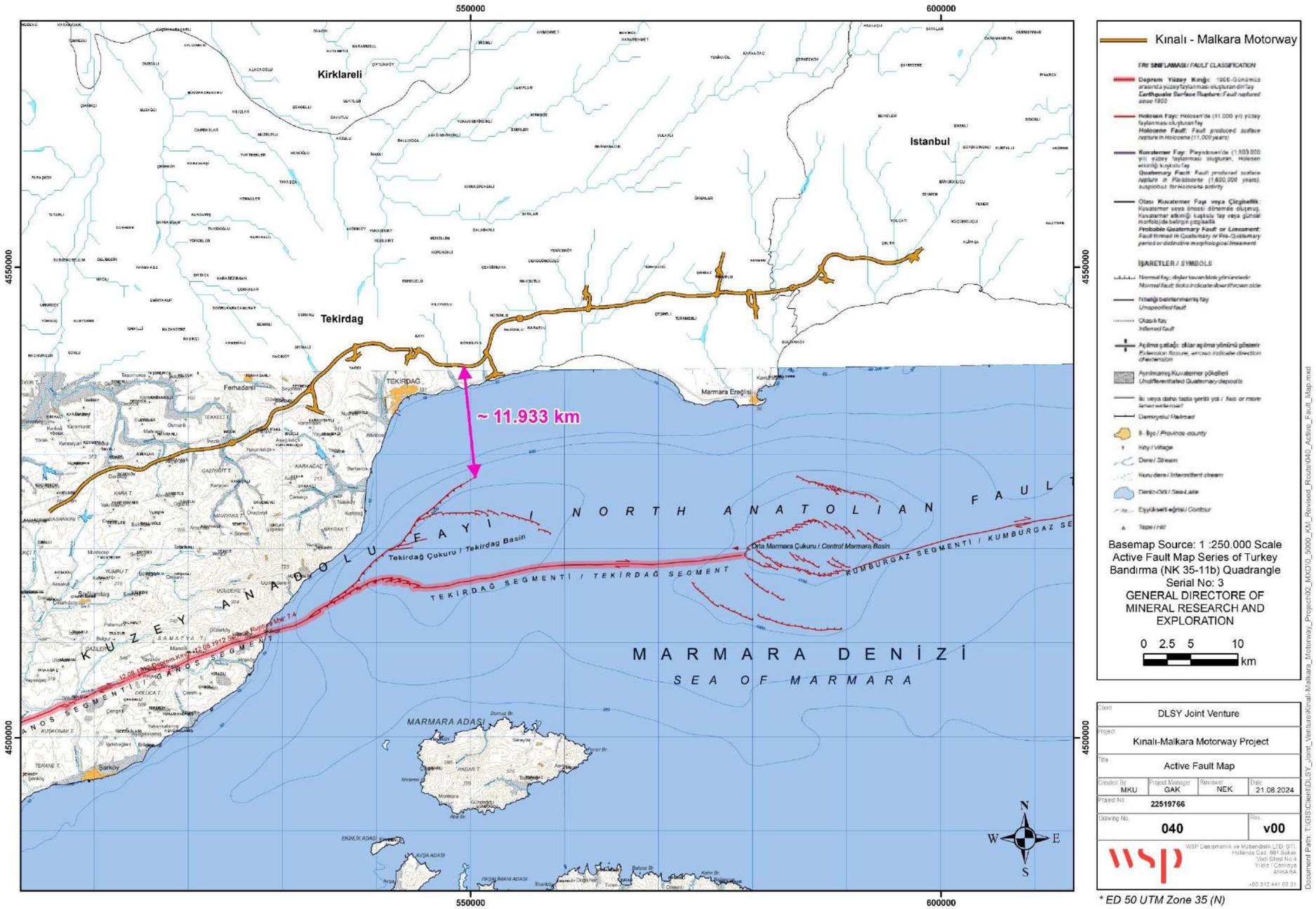



**Figure 38: Active Faults Around the Project Area and its Surroundings[28]**

[28] It should be noted that since there are no active faults on the north side of the Thrace, no map was prepared by the Mineral Research and Exploration for these areas.

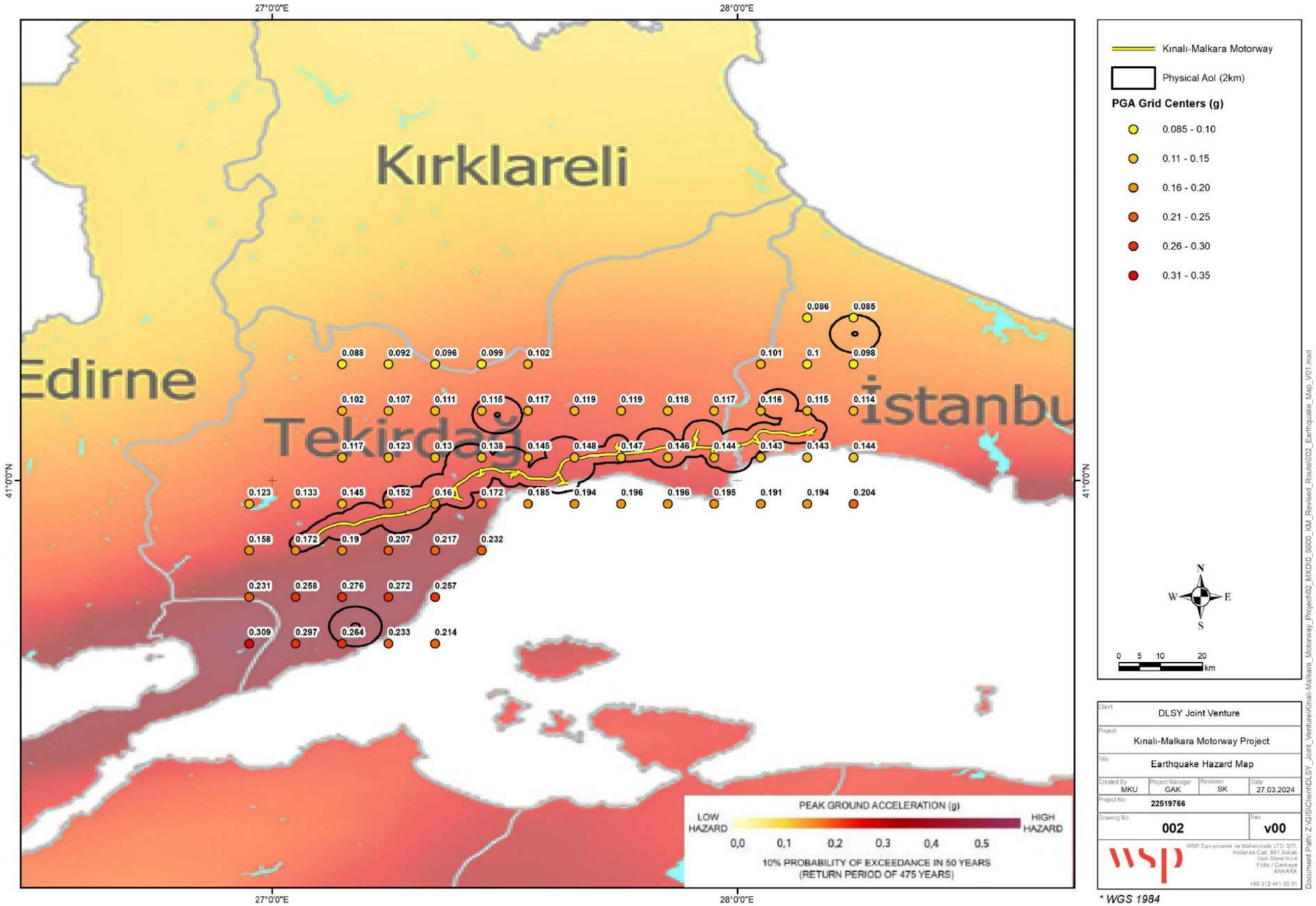



**Figure 39: Earthquake Hazard Map of the Physical AoI**

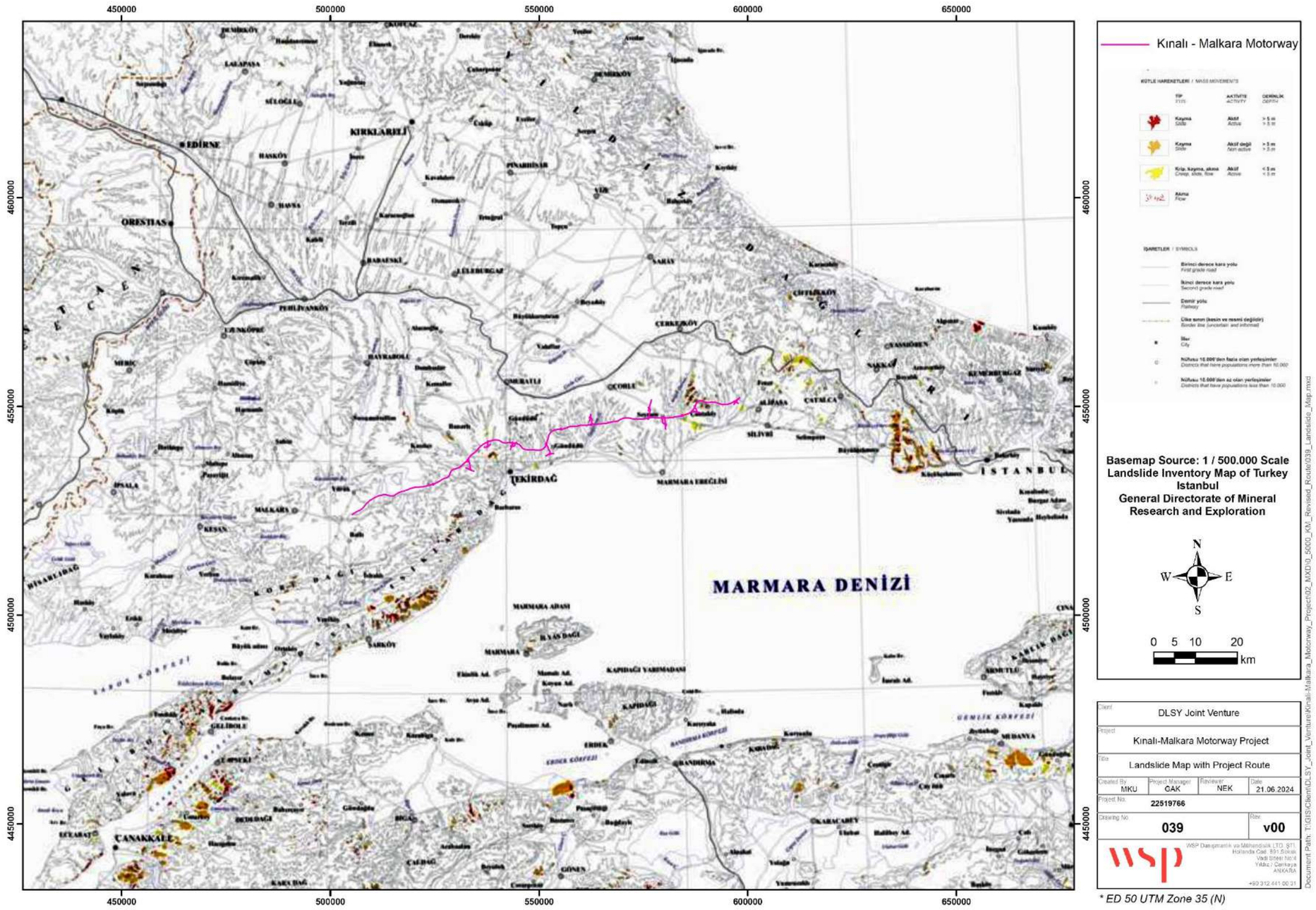



**Figure 40: 1/500,000 Scaled Landslide Map of the Project Route (edited from Mineral Research and Exploration)** [29]

[29] Red: Active Landslide Area, Yellow: General Lateral Movements of Soft Clay (creep, slide, flow), Orange: Paleo-Landslide

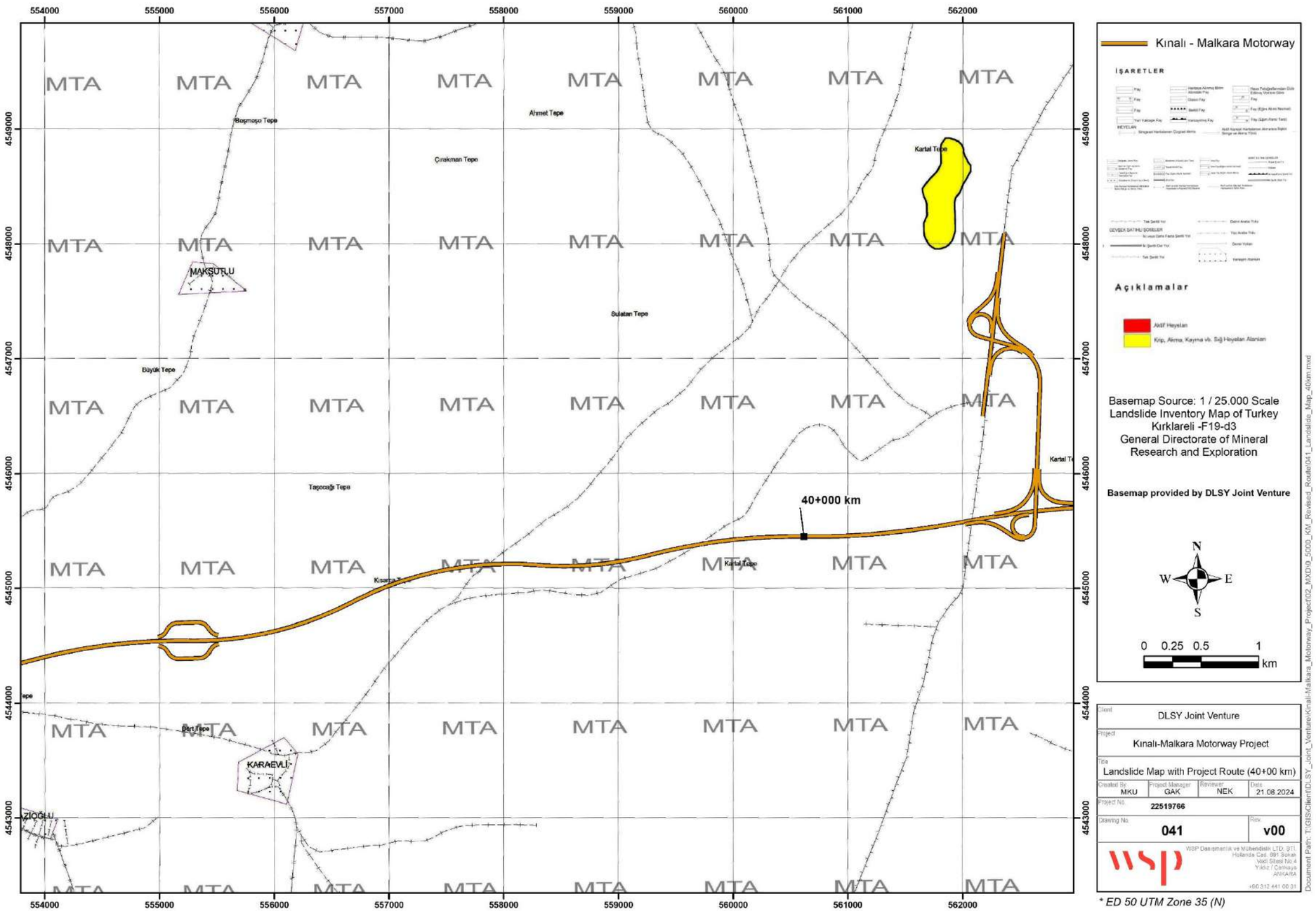



**Figure 41: Landslide Areas Around the 40th Kilometer of the Project Route (Red: Active Landslide Area (modified from Mineral Research and Exploration)[30]**

[30] Red: Active Landslide Area, Yellow: General Lateral Movements of Soft Clay

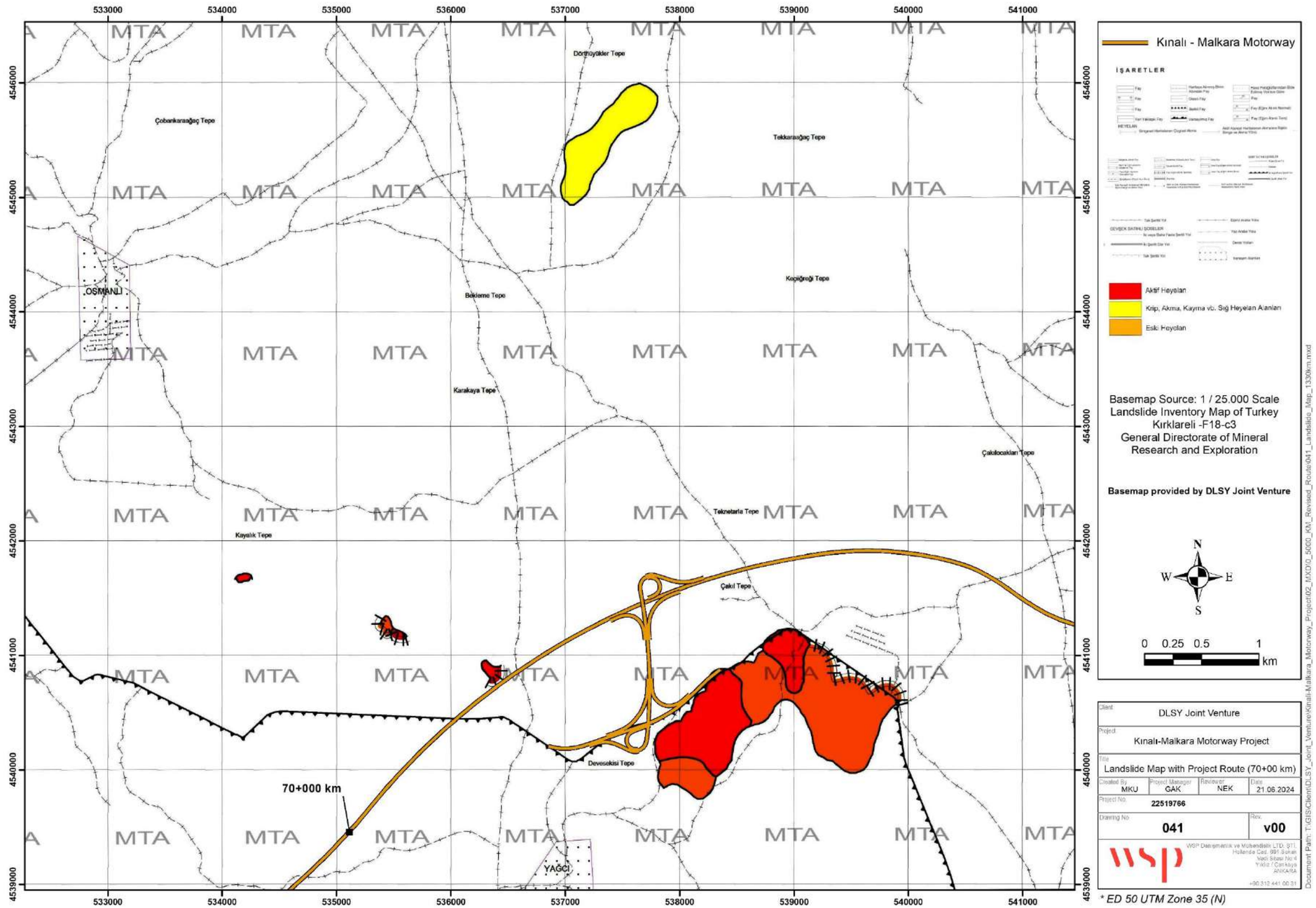



**Figure 42: Landslide Areas Around the 70th Kilometer of the Project Route (Red: Active Landslide Area (modified from Mineral Research and Exploration)[31]**

[31] Red: Active Landslide Area, Yellow: General Lateral Movements of Soft Clay, Orange: Paleo-Landslide

## 6.1.5 Soil and Subsoil

### *6.1.5.1 Soil Characteristics*

Information regarding soil pedology and land use has been collected through desktop studies.

Of the many soil types in Türkiye, 22 types are considered as “Main Soils,” and 4 of these described below are common in the Project Area.

*Alluvial Soil:* The soil materials are accumulated by alluviation. Mineral composition is heterogeneous and based on lithological composition of river basins plus erosion and built-up circuits during soil formation in geological periods. The surface is humid and rich in organic matter; slight reduction of subsoil occurs. All kinds of cultivated plants can be planted on this fertile soil.

*Brown Forest Soil:* Brown Forest soils develop under deciduous broadleaf forests in temperate climatic regions. It was formed under the influence of climate, vegetation, and natural rock. Since it is formed under the forest, it is rich in organic matter (humus), usually dark coloured.

*Non-calcareous Brown Forest Soil:* The topsoil is soft or somewhat firm. The subsoil is heavier and harder. Although lime is washed out, the reaction is neutral or alkaline. Natural drainage is good. The natural vegetation is mixed forest or heather with shrubs and grasses.

*Vertisol Soil:* They are dark coloured and very clayey soils that shrink in the dry season and expand in the rainy season. Their surfaces are cracked. These soils are mainly seen below 300 altitudes. Most Vertisols form in depressions, while some thrive on low slopes. Their permeability is low. During cracking, thin roots are broken and the product is damaged. Even with irrigation, the number of crops grown is limited. There is always the danger of erosion on sloping lands. During the rainy season most of the Vertisols in the depressions are submerged. Land drainage is almost impossible.

Soil classes are classified according to the suitability of soil for cultivation. Soil classes used by the Ministry of Agriculture and Rural Affairs are shown in Table 40 and Figure 43 below. The Project is large scale project and spread over a wide area. Therefore, all soil classes were identified on the Project Area.

**Table 40: Soil Classes**

| Class | Suitability for Cultivation | Cultivation Limiting factors |
|---|---|---|
| I | Suitable for many crop types. | No limitations. |
| II | Suitable for long term cultivation of various crops. | It requires measures against soil and water loss. |
| III | Suitable for cultivation of certain types of crops for which special protection measures are provided. | It is open to erosion and requires artificial drainage for cultivation. |
| IV | Suitable for some crops. It requires special care when used for agricultural purposes. | There are limitations in terms of depth of soil, stone content, humidity, and slope. |
| V | Plain or slight slope, stony or lush soil. It is not suitable for ploughing or cultivation. It is grassland or forest area. | It has a weak drainage and a structure that is not suitable for ploughing. |
| VI | Not suitable for ploughing or cultivation. It is generally used as grazing area or forest area. | There are limitations in terms of slope and shallow soil. |

| Class | Suitability for Cultivation | Cultivation Limiting factors |
|---|---|---|
| VII | Not economically feasible for agriculture but it is suitable for some grazing or forestation. | There are limitations in terms of shallow soil, stone content, slope and erosion. |
| VIII | Not suitable for flora habitats. It may be used for recreational purposes or can be designated as protection area for wildlife. | Poor soil content. |

In the Project Area/route, non-irrigated arable lands are the most common lands with a total area of 222.39 km$^2$. Other major land use types are lands principally occupied by agriculture, with significant areas of natural vegetation, broad-leaved forests and complex cultivation patterns (Table 41). CORINE 2018 Land Use Classification of the Project Area is presented in Figure 45.

**Table 41: Land Usage in the Project Area**

| CLC Code | Description | Area (km$^2$) |
|---|---|---|
| 112 | Discontinuous urban fabric | 4.93 |
| 121 | Industrial or commercial units | 1.46 |
| 122 | Road and rail networks and associated land | 0.36 |
| 131 | Mineral extraction sites | 0.55 |
| 133 | Construction sites | 0.40 |
| 211 | Non-irrigated arable land | 222.39 |
| 221 | Vineyards | 0.09 |
| 231 | Pastures | 4.18 |
| 242 | Complex cultivation patterns | 6.37 |
| 243 | Land principally occupied by agriculture, with significant areas of natural vegetation | 10.12 |
| 311 | Broad-leaved forest | 6.50 |
| 312 | Coniferous forest | 0.70 |
| 324 | Transitional woodland-shrub | 1.67 |
| 512 | Water bodies | 0.11 |

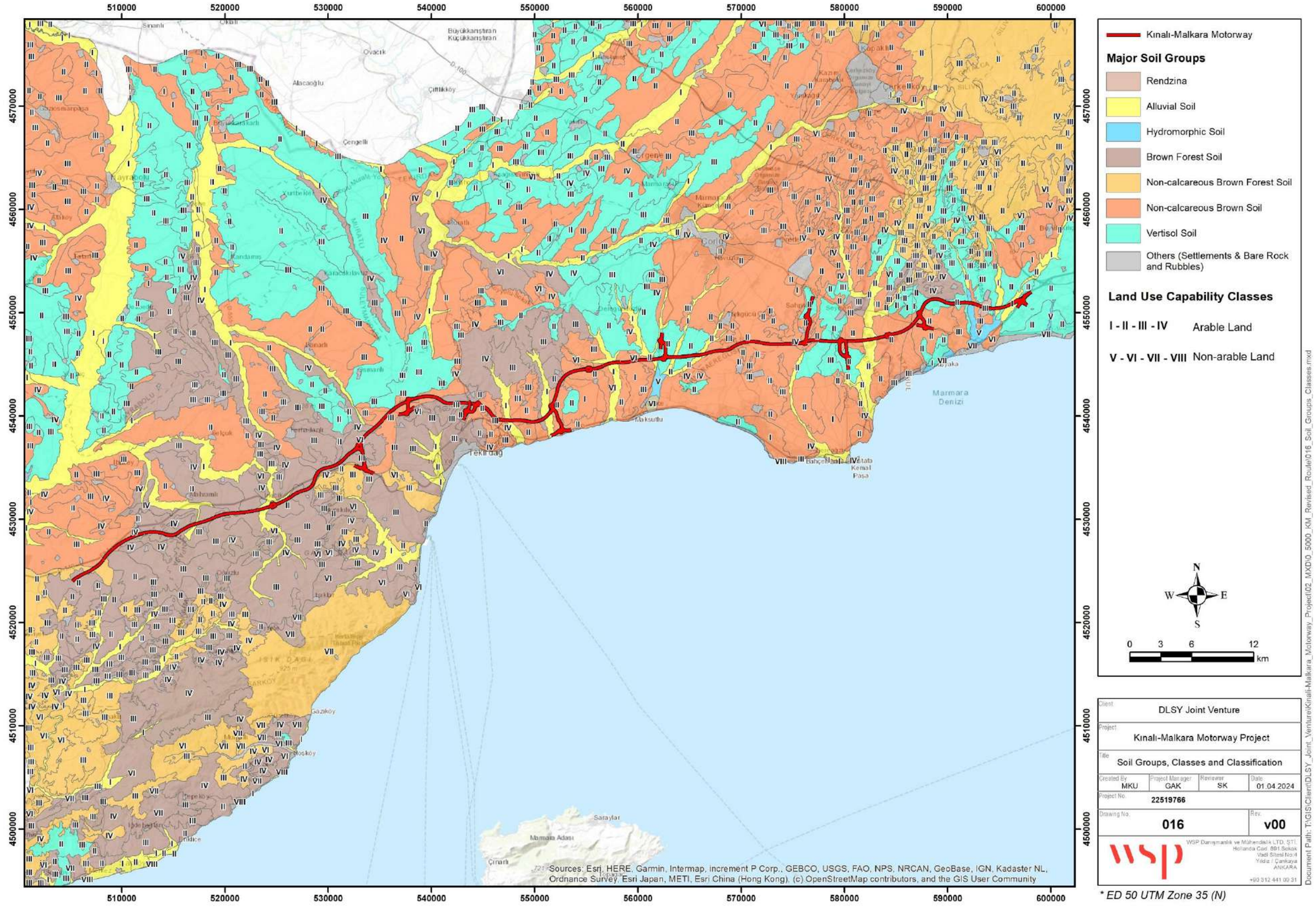



**Figure 43: Soil Groups and Classes**

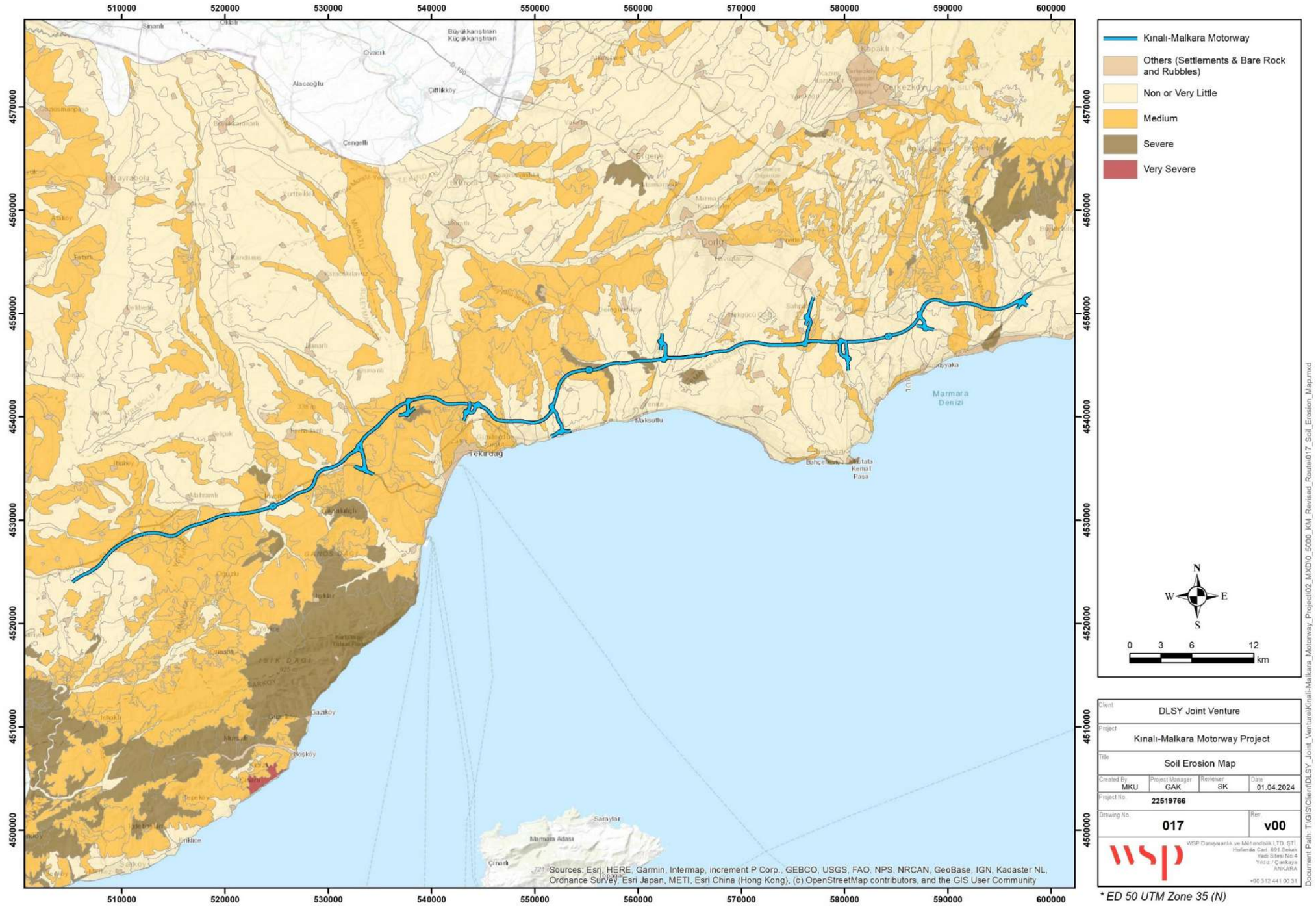



**Figure 44: Soil Erosion Map**

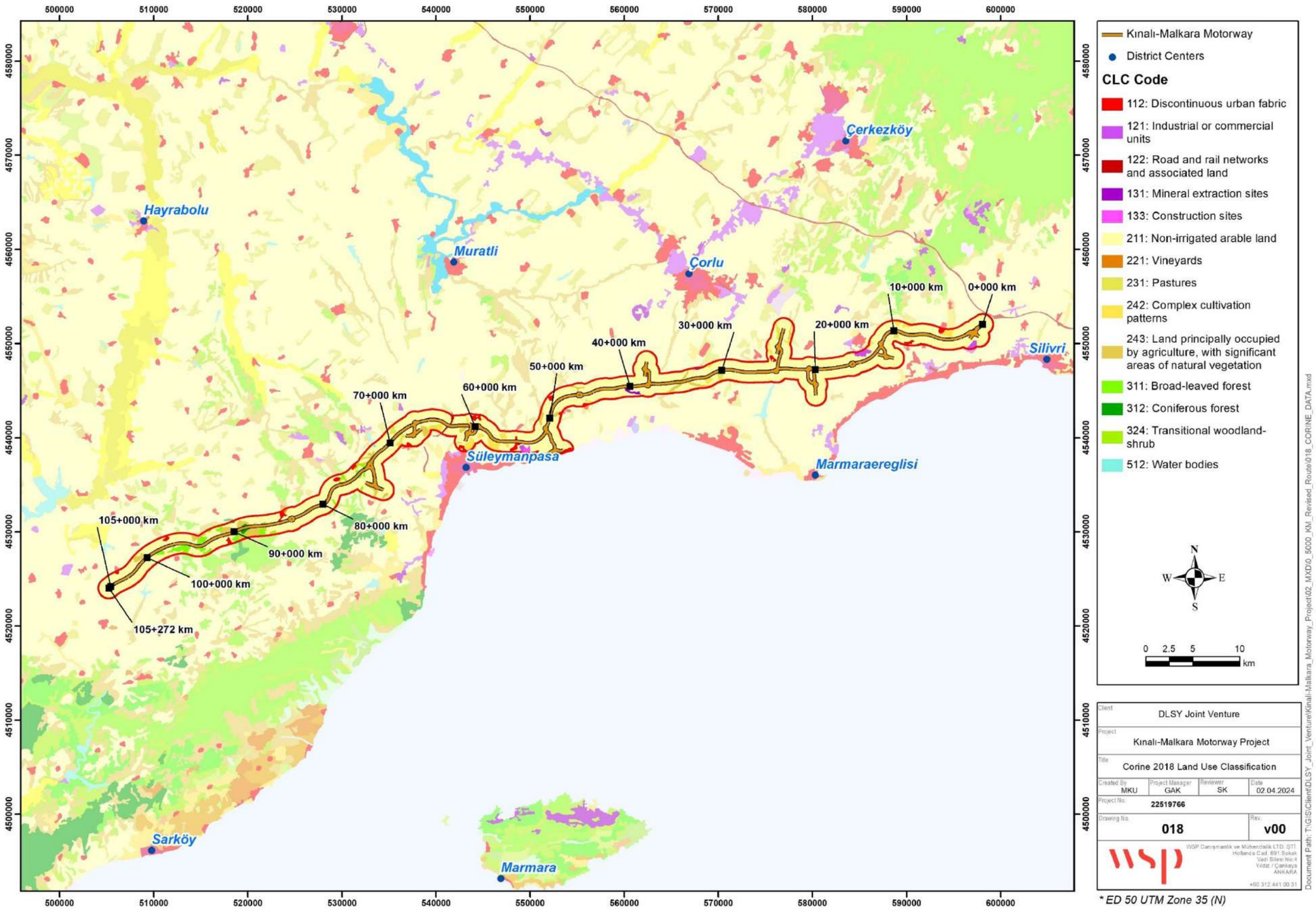



**Figure 45: CORINE 2018 Land Use Classification**

### 6.1.5.2 Historical Land Use

The historical land use of the project area was analysed by applying a 1 km buffer and using the Corine 2012 and Corine 2018 data. The study reveals only five land class changes between these dates. These changes are outlined in the Table 41 and illustrated in Figure 46.

**Table 42: Historical Land Use Corine 2012-2018 Data**

| CORINE Changes [2012-2018] on Project Route (1 km Buffer on Each Side) | | | | |
|---|---|---|---|---|
| Area ID | Change (2012-2018) | Situation in 2012 | Situation in 2018 | Approx. Kilometres on the Route |
| 0 | 211-112 | 211: Non-irrigated Arable Land | 112: Discontinuous Urban Fabric | 60+000 km and 50+000 km |
| 1 | 211-121 | 211: Non-irrigated Arable Land | 121: Industrial or Commercial Units | 20+000 km and 10+000 km |
| 2 | 211-133 | 211: Non-irrigated Arable Land | 133: Construction Sites | 60+000 km and 50+000 km |
| 3 | 211-133 | 211: Non-irrigated Arable Land | 133: Construction Sites | 60+000 km and 50+000 km |
| 4 | 211-133 | 211: Non-irrigated Arable Land | 133: Construction Sites | 60+000 km and 50+000 km |
| 5 | 231-133 | 231: Pastures | 133: Construction Sites | 65+000 km and 60+000 km |

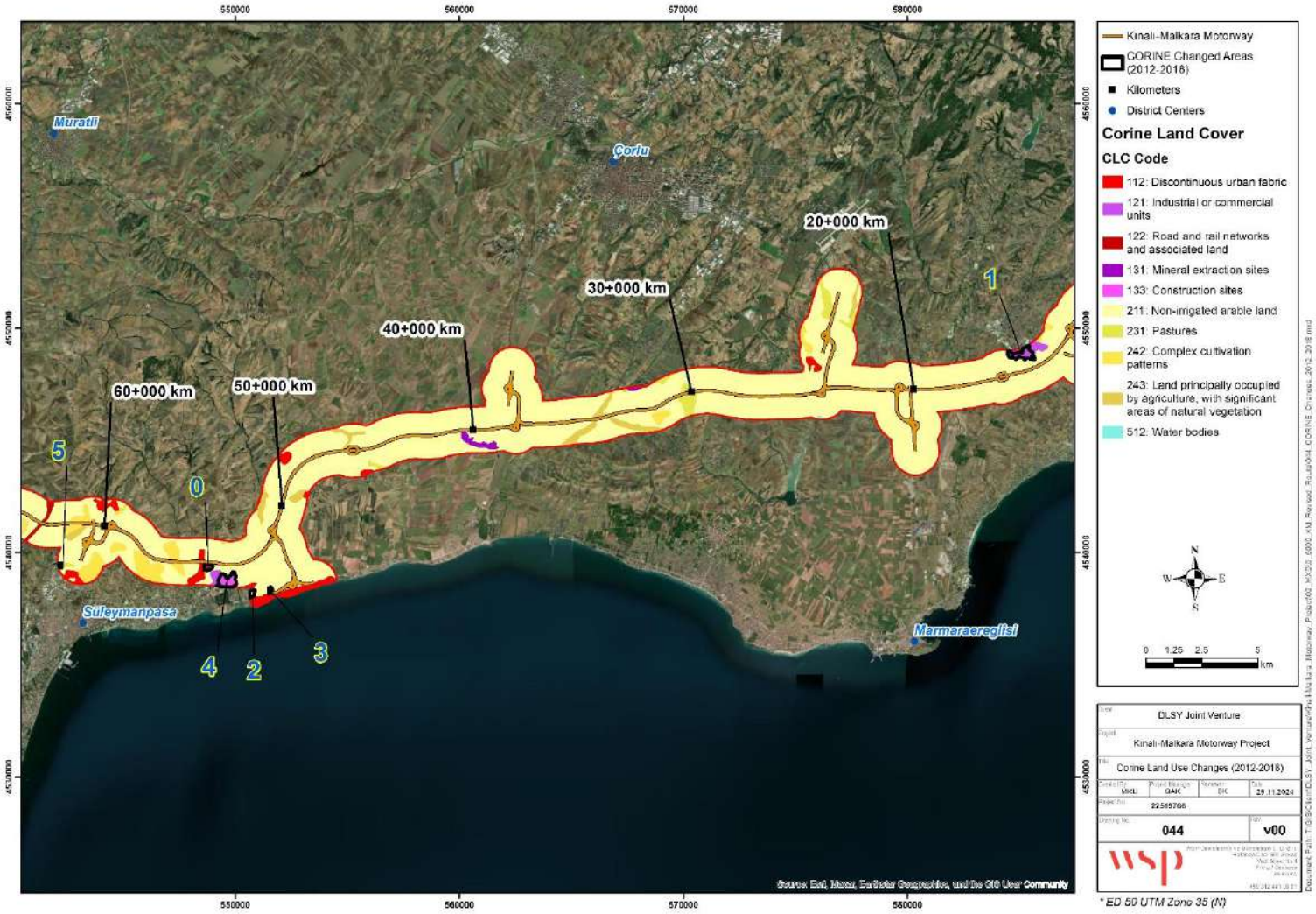



**Figure 46: Lan Use Comparison of Corine 2012-2018 Data**

### 6.1.5.3 Baseline Soil Quality

The “Soil Pollution Control and Sites Polluted by Point Source Contamination Regulation” was published on June 8th, 2010 (Official Gazette Date: 08.06.2010, Number: 27605) [32]and was fully implemented on June 8th, 2015. In accordance with the new regulation, it is obligatory to prevent pollution, stop pollution release in the polluted areas and determine the extent of pollution.

The soil concentrations measured for the purposes of this study were compared to the generic limit values mentioned in the Annex I of the Regulation.

Annex I of the updated regulation contains different generic limit values dependent on the exposure routes (pathways):

- Generic Limit Value-1: Soil ingestion and absorption through skin contact,
- Generic Limit Value-2: Inhalation of volatile matter in external environment,
- Generic Limit Value-3: Inhalation of fugitive dust in the external environment, and
- Generic Limit Value-4: Transport of pollutants into groundwater and drinking of groundwater (Safety Factor (SF) = 1 or 10).

The Generic Limit Value-1 and Generic Limit Value-3 are used for the surface/shallow soil samples and Generic Limit Value-2 and Generic Limit Value-4 are used for sub-soil samples.

In order to determine the existing soil contamination and quality of the Project Area, 34 soil samples were collected between March 14th, 2023 and March 19th, 2023 and sent to the TÜRKAK accredited Encon Laboratuvarı A.Ş. with the scope of baseline studies.

Soil samples collected during field exploration were analysed for the parameters listed below:

- Total Organic Halogens (TOX);
- Total Petroleum Hydrocarbons (TPH);
- Benzene, toluene, ethylbenzene and xylenes (BTEX);
- Volatile Organic Compounds;
- Heavy Metals (As, Cu, Ba, Hg, Zn, Cd, Co, Cr, Pb, Ni, V).

Baseline data are collected for the purpose of a preliminary and general assessment on the soil quality. The analytical results were compared to the generic limit values mentioned in the Annex I of the Turkish Soil Pollution Control and Sites Polluted by Point Source Contamination Regulation. Soil sampling locations are shown in Figure 47 and the measurement results of the parameters are presented in Table 43, Table 44 and Table 45.

In the Regulation, limits are given for TPH according to the carbon numbers separated into their fractions, and for BTEX, separate limit values are given for benzene, toluene, ethylbenzene, and xylenes. Since the analysis results reported by the laboratory include total TPH and BTEX, they could not be compared with the limit values of the regulation. In addition, there is no limit value for TOX value in the regulation.

[32] https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=14026&MevzuatTur=7&MevzuatTertip=5

According to the regulation, when calculating the limit values given above, it is assumed that the site is used for residential purposes or will be used for residential purposes in the future and people will be exposed to the pollutant at “maximum level for a reasonable period of time”. The reason for assuming that the site will be used for residential purposes now or in the future is that the generic values given above will be more protective in terms of health risk compared to other scenarios (business, industrial purpose, etc.)[33]. One of the important reasons for using the pathways selected above is that in scenarios where land use for residential purposes is valid, pollutants will generally reach the receivers via these pathways. Another reason is that the methods, models, and assumptions to be used in the calculation of generic values for these pathways have been developed in a way that can be considered quite standard[34]. For each of these pathways, generic limit values have been determined that the pollutant will not pose a health risk to the recipient. Generic limit values are quite low as they are calculated assuming the worst possible case.

TPH and TOX Aromatic concentrations were detected at the most soil sampling locations, additionally, no VOC (including BTEX) concentration exceeding the laboratory detection limits was observed in any of the soil samples. The observed surface soil TPH results can be assumed to come from local contaminations (e.g., oil spills from the past) at the time of the sampling and no volatile components were detected at the same points. No historical soil contamination investigation was available at the Project Area.

[33] US Environmental Protection Agency, Office of Solid Waste and Emergency Response. (July 1996). Soil Screening Guidance: User’s Guide. Washington DC: US Environmental Protection Agency.

[34] US Environmental Protection Agency, Office of Solid Waste and Emergency Response. (July 1996). Soil Screening Guidance: Technical Background Document. Washington DC: US Environmental Protection Agency.

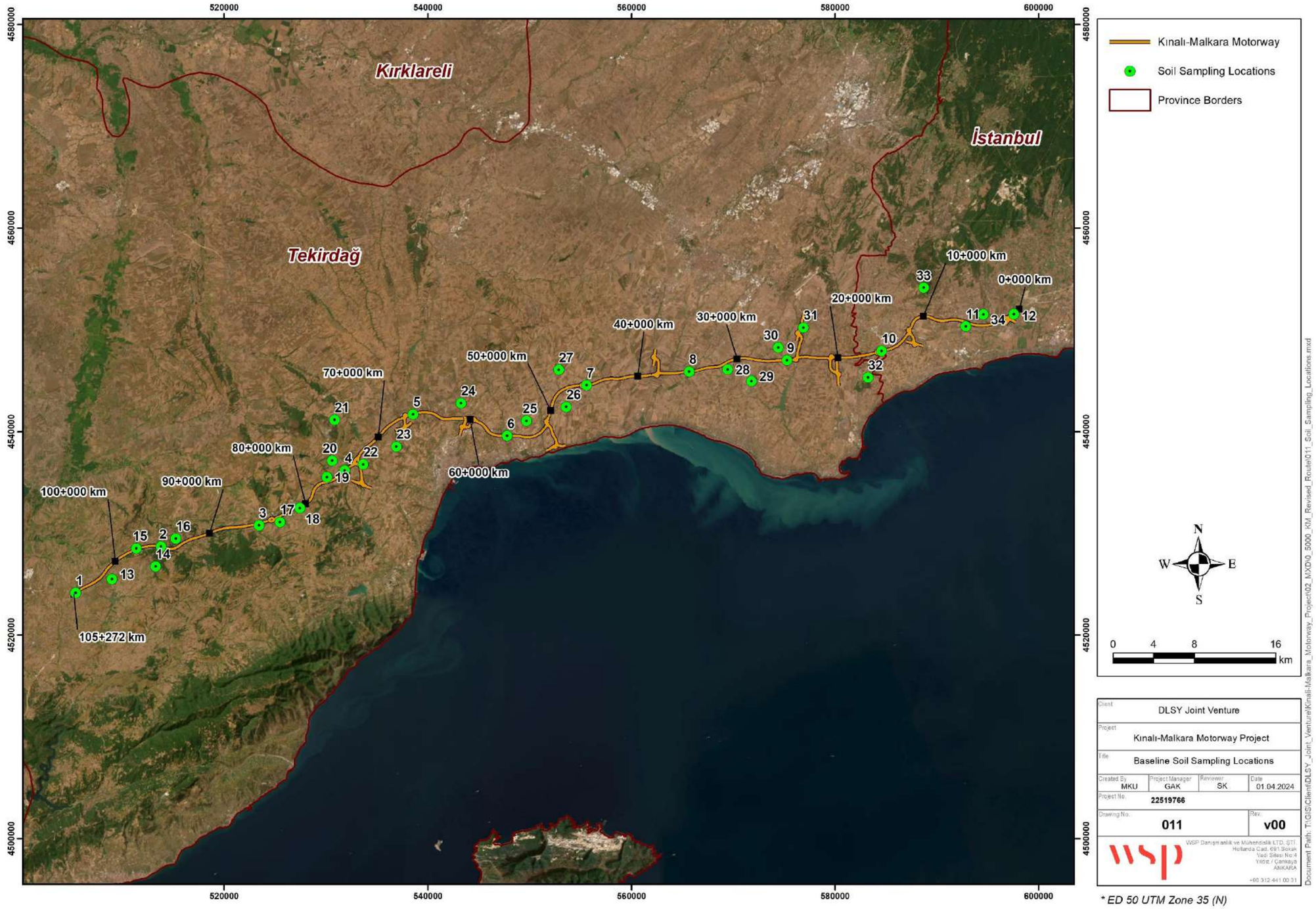



**Figure 47: Baseline Soil Quality Measurement Locations**

**Table 43: Soil Sampling Measurement Results**

| Sample ID | TOX (mg/kg) | TPH (mg/kg) | TVOCs (mg/kg) | BTEX (mg/kg) |
|---|---|---|---|---|
| S-1 | <10 | <25 | <0.25 | <0.25 |
| S-2 | <10 | **28.91** | <0.25 | <0.25 |
| S-3 | <10 | <25 | <0.25 | <0.25 |
| S-4 | **116** | <25 | <0.25 | <0.25 |
| S-5 | **69** | **28.55** | <0.25 | <0.25 |
| S-6 | **158** | <25 | <0.25 | <0.25 |
| S-7 | <10 | <25 | <0.25 | <0.25 |
| S-8 | <10 | <25 | <0.25 | <0.25 |
| S-9 | **16.4** | <25 | <0.25 | <0.25 |
| S-10 | **25** | <25 | <0.25 | <0.25 |
| S-11 | **24** | <25 | <0.25 | <0.25 |
| S-12 | **16** | **29.75** | <0.25 | <0.25 |
| S-13 | <10 | **34.65** | <0.25 | <0.25 |
| S-14 | <10 | <25 | <0.25 | <0.25 |
| S-15 | **458** | <25 | <0.25 | <0.25 |
| S-16 | <10 | <25 | <0.25 | <0.25 |
| S-17 | **11.3** | <25 | <0.25 | <0.25 |
| S-18 | **44.7** | **25.83** | <0.25 | <0.25 |
| S-19 | **25.1** | **32.14** | <0.25 | <0.25 |
| S-20 | <10 | **27.21** | <0.25 | <0.25 |
| S-21 | <10 | <25 | <0.25 | <0.25 |
| S-22 | <10 | **34.44** | <0.25 | <0.25 |
| S-23 | **20.1** | **31.42** | <0.25 | <0.25 |
| S-24 | <10 | **33.26** | <0.25 | <0.25 |
| S-25 | **59.4** | <25 | <0.25 | <0.25 |
| S-26 | **10.1** | **29.28** | <0.25 | <0.25 |
| S-27 | **34.6** | **26.59** | <0.25 | <0.25 |
| S-28 | <10 | <25 | <0.25 | <0.25 |
| S-29 | **11.2** | <25 | <0.25 | <0.25 |
| S-30 | <10 | <25 | <0.25 | <0.25 |
| S-31 | <10 | **25.28** | <0.25 | <0.25 |
| S-32 | <10 | <25 | <0.25 | <0.25 |
| S-33 | **16** | **32.79** | <0.25 | <0.25 |
| S-34 | **15** | <25 | <0.25 | <0.25 |

**Table 44: Soil Sampling Measurement Results cont.**

| Parameters | Ingestion of soil or dermal contact (mg/kg oven dry soil) | Outdoor inhalation of fugitive dust (mg/kg oven dry soil) | S-1 | S-2 | S-3 | S-4 | S-5 | S-6 | S-7 | S-8 | S-9 | S-10 | S-11 | S-12 | S-13 | S-14 | S-15 | S-16 | S-17 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| As | 0.4 | 471 | 5.1 | 7.6 | 3.5 | <1.0 | 3.2 | 3.7 | 1.9 | 6.3 | 1.5 | 4.4 | 10.2 | 6.3 | 2.9 | 4.3 | 2.4 | 2.9 | 3.0 |
| Cu | 3129 | - | 78.8 | 116.7 | 75.7 | 16.1 | 28.8 | 23.5 | 27.1 | 41.7 | 14.4 | 23.9 | 20.5 | 31.2 | 41.9 | 51.1 | 56.8 | 55.1 | 52.9 |
| Ba | 15643 | - | 105.5 | 137.5 | 121.9 | 90.6 | 97.8 | 93.8 | 120.7 | 276.0 | 104.2 | 109.6 | 214.7 | 97.3 | 103.3 | 126.2 | 131.6 | 79.4 | 82.5 |
| Hg | 23 | - | 0.4 | 0.2 | 0.2 | 0.2 | 0.4 | 0.1 | 0.4 | 0.3 | 0.3 | 0.6 | 0.4 | 0.4 | 0.1 | 0.2 | 0.3 | 0.2 | 0.2 |
| Zn | 23464 | - | 80.1 | 110.2 | 89.6 | 42.6 | 70.2 | 52.4 | 69.1 | 99.3 | 40.0 | 58.6 | 57.7 | 80.7 | 92.2 | 83.5 | 89.7 | 79.2 | 64.6 |
| Cd | 70 | 1124 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 |
| Co | 23 | 225 | 15.1 | 23.1 | 19.1 | 9.8 | 15.7 | 16.2 | 17.6 | 22.7 | 9.2 | 21.6 | 15.8 | 19.6 | 20.7 | 18.8 | 19.1 | 18.7 | 12.7 |
| Cr | 235 | 24 | 98.0 | 160.1 | 118.0 | 34.5 | 74.7 | 68.4 | 89.1 | 154.6 | 38.3 | 83.3 | 78.7 | 92.3 | 133.9 | 110.2 | 114.6 | 155.3 | 81.8 |
| Pb | 400 | - | 13.6 | 21.7 | 14.4 | 10.0 | 9.4 | 8.0 | 17.1 | 16.7 | 10.6 | 14.8 | 8.4 | 12.3 | 13.9 | 13.2 | 13.6 | 10.1 | 11.9 |
| Ni | 1564 | - | 96.0 | 179.6 | 127.2 | 24.2 | 77.3 | 87.7 | 116.7 | 170.9 | 30.5 | 110.2 | 20.1 | 139.8 | 129.0 | 112.6 | 113.8 | 168.8 | 79.6 |
| V | 548 | - | 89.1 | 118.8 | 105.6 | 42.3 | 83.4 | 77.0 | 91.1 | 132.1 | 52.8 | 75.9 | 73.3 | 94.4 | 129.7 | 101.3 | 92.9 | 111.9 | 82.1 |

**Table 45: Soil Sampling Measurement Results cont.**

| Parameters | Ingestion of soil or dermal contact (mg/kg oven dry soil) | Outdoor inhalation of fugitive dust (mg/kg oven dry soil) | S-18 | S-19 | S-20 | S-21 | S-22 | S-23 | S-24 | S-25 | S-26 | S-27 | S-28 | S-29 | S-30 | S-31 | S-32 | S-33 | S-34 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| As | 0.4 | 471 | 2.3 | 3.1 | 2.1 | 3.8 | 1.4 | <1.0 | 3.6 | 2.7 | 17.9 | 4.2 | 1.5 | 3.9 | <1.0 | 2.6 | 3.3 | 6.5 | 6.2 |
| Cu | 3129 | - | 33.4 | 15.1 | 9.6 | 90.0 | 12.1 | 10.0 | 18.1 | 22.4 | 21.7 | 21.9 | 7.9 | 10.8 | 3.0 | 14.2 | 24.6 | 18.6 | 20.5 |
| Ba | 15643 | - | 81.3 | 50.3 | 68.3 | 137.1 | 60.2 | 58.7 | 169.7 | 102.2 | 66.5 | 148.2 | 98.8 | 88.6 | 17.5 | 167.1 | 110.8 | 235.1 | 135.3 |
| Hg | 23 | - | 0.2 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 | 0.3 | 0.4 | 0.3 | <0.1 | 0.1 | <0.1 | 0.5 | 0.4 | 4.2 |
| Zn | 23464 | - | 66.2 | 47.3 | 27.6 | 82.7 | 32.9 | 25.4 | 52.4 | 57.7 | 58.7 | 90.7 | 24.2 | 34.2 | 11.5 | 42.5 | 64.8 | 58.7 | 69.1 |
| Cd | 70 | 1124 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 |
| Co | 23 | 225 | 15.4 | 15.9 | 7.4 | 16.3 | 12.3 | 9.1 | 14.8 | 15.2 | 13.8 | 10.2 | 8.8 | 7.1 | 2.5 | 10.5 | 16.3 | 13.8 | 11.4 |
| Cr | 235 | 24 | 104.2 | 70.8 | 25.4 | 99.8 | 36.5 | 26.9 | 70.3 | 62.6 | 66.6 | 42.7 | 22.9 | 36.9 | 22.1 | 35.2 | 79.0 | 63.2 | 50.6 |
| Pb | 400 | - | 8.6 | 15.7 | 7.0 | 10.3 | 11.1 | 7.1 | 20.4 | 24.3 | 10.1 | 10.2 | 13.0 | 7.9 | 2.9 | 27.7 | 10.7 | 12.2 | 9.0 |
| Ni | 1564 | - | 101.2 | 125.0 | 26.0 | 95.8 | 36.2 | 36.3 | 66.9 | 68.4 | 80.2 | 51.4 | <0.5 | 9.1 | 22.5 | 14.9 | 71.5 | 38.8 | 69.1 |
| V | 548 | - | 98.0 | 50.4 | 35.3 | 101.3 | 38.6 | 36.9 | 73.5 | 63.3 | 71.8 | 49.2 | 32.0 | 51.4 | 7.4 | 52.5 | 84.2 | 94.3 | 59.7 |

It should be noted that Türkiye does not have a publicly available database on contaminated sites or potential sources of contamination. Therefore, there is no baseline information available about any known or suspected contaminated land along the motorway route, such as from spills or waste dumping from current or past industrial activities or unofficial municipal dumps.

Soil samples were selected along the route and near related facilities, as construction activities will be most intense in these areas. Sampling locations were chosen based on the idea that pollution potential from the project will be highest where construction activities are active. Therefore, the goal was to obtain baseline data in these areas.

Information about the specific studies that need to be done due to the reasons mentioned above are given in the impact assessment chapter.

### 6.1.6 Hydrology and Surface Water Quality

Hydrological Characterizations and Baseline Surface Water Quality Assessments were carried out according to the Primary and Secondary Data sources. A water quality survey was carried out in the Project Area and its vicinity to obtain the **Primary Data.**

The quality of the surface water is determined by considering whether the measured values of the specified parameters exceed the water quality regulatory standards, objectives, and guidelines. The Project Standards and applicable environmental limits are provided in Chapter 2.

The reports which were used as **Secondary Data** sources are listed below:

- Kınalı-Tekirdağ-Çanakkale-Savaştepe 1st and 2nd Section Highway Final EIA Report, Ak-Tel, Nov. 2016.
- Meriç-Ergene and Marmara Basins Drought Management Plan Project, Marmara Basin Drought Management Plan Strategic Environmental Assessment Scoping Report, General Directorate of Water Management (GDWM), May 2022.
- Meriç-Ergene and Marmara Basins Drought Management Plan Project, Meriç-Ergene Basin Drought Management Plan Strategic Environmental Assessment Scoping Report, General Directorate of Water Management (GDWM), May 2022.
- Meriç-Ergene and Marmara Basins Drought Management Plan Project, Marmara Basin Strategic Environmental Assessment Scope Determination Report, General Directorate of Water Management (GDWM), May 2023.
- Meriç-Ergene and Marmara Basins Drought Management Plan Project, Meriç-Ergene Basin Strategic Environmental Assessment Scope Determination Report, General Directorate of Water Management (GDWM), May 2023.

The Regional and Local Hydrology, and the Baseline Surface Water Quality of the Project Route and its vicinity are discussed herein.

#### *6.1.6.1 Regional Context*

The Project Route and its vicinity are located within both the Meriç-Ergene (Evros) River Basin and the Marmara Basin, which are 2 of the 25 major basins of Türkiye determined considering geographical components including geographical location, climate and stream network.

## Meriç-Ergene (Evros) Basin

Meriç-Ergene River Basin is a transboundary basin which extends to three countries: Bulgaria, Greece and Türkiye. The Basin Area is about 53,000 km$^2$, of which 66% of belongs to Bulgaria, 28% to Türkiye and 6% to Greece[35].

The Meriç-Ergene River Basin is in the Thrace region of Türkiye, with the Bulgarian and Strandja Mountains bordering the waterline to the north. The basin encompasses the districts of Vize, Saray, and Çerkezköy to the east, while extending from the northern to the southern parts of the Çorlu district in Tekirdağ province and along the border of Greece and Bulgaria to the west. The Ergene River, which originates from the Istranca Mountains, converges with the Meriç River and empties into the Saros Gulf. The river basin covers an area of 14,510 km$^2$, which represents 1.8% of Türkiye's total surface area (Figure 48)[36].

The most important rivers of the Meriç-Ergene River Basin are the Meriç (Evros, Maritza) River and Ergene River. Meriç River originates from the north of Rila Mountain in Bulgaria and starts flowing towards the southeast direction. It crosses the Filibe (Plovdiv) Plain in Bulgaria and enters Türkiye north of Edirne. The main tributaries of the Evros River are the Arda, Tunca and Ergene Rivers. The river first merges with the Evros Stream within the borders of Türkiye is Arda River, which joins as a right tributary. Shortly after the Arda River, the Tunca River joins the Meriç River as a left tributary in Edirne city centrum, and the Meriç River starts heading up southward, drawing the Türkiye-Greece border.

Meriç River flows towards the southwest after merging with Ergene River, the most important river of the Ergene Sub-Basin, in the north of the İpsala district of Edirne province. The main tributaries of the Ergene River are Çorlu, Kaynarlı, Sulucak, Şeytandere, Hayrabolu, Ova, Ana and Kuleli streams. The Ergene River originates from the springs around the 312-altitude Taşpınar Hill of the Istranca (Yıldız) Mountains in the north of Saray district of Tekirdağ province in the northeast of the Ergene sub-basin and starts to flow in the south direction as Güneşkaya Stream. First, it merges with the Manika Stream from the east and flows to the southwest. Near İnanlı Village, it merges with Çorlu Stream and takes the name Ergene River and starts to flow towards the north of the basin. After merging with Sulucak and Kaynarlı Streams near Lüleburgaz, the Ergene River heads west. At Pehlivanköy, which is around 35 km west of Lüleburgaz, the river merges with Şeytandere coming from the north and Anaçay coming from the south. Ana (Ova) and Kuleli Creeks coming from the north of the river merge with the Ergene River after merging around Sazlımalkoç village in the Uzunköprü district of Edirne province. After that, the Ergene River flows to the southwest, passes through Uzunköprü and merges with the Meriç River near the village of Balabancık.

In the south of İpsala, the Meriç River divides into two main branches. The first branch leaves the Turkish border, crosses into Greece, and flows into the Saros Gulf. The other branch forms swamps and ponds such as Dalyan and Gala ponds and flows through Turkish territory to the Saros Gulf (Aegean Sea) near Enez.

[35] Angelidis, P., Mystakidis, G., Lalikidou, S., Hrissanthou, V., & Kotsovinos, N. (2010). Computation of Hydrographs in Evros River Basin. European Water 31, 33-42.

[36] Angelidis, P., Mystakidis, G., Lalikidou, S., Hrissanthou, V., & Kotsovinos, N. (2010). Computation of Hydrographs in Evros River Basin. European Water 31, 33-42.

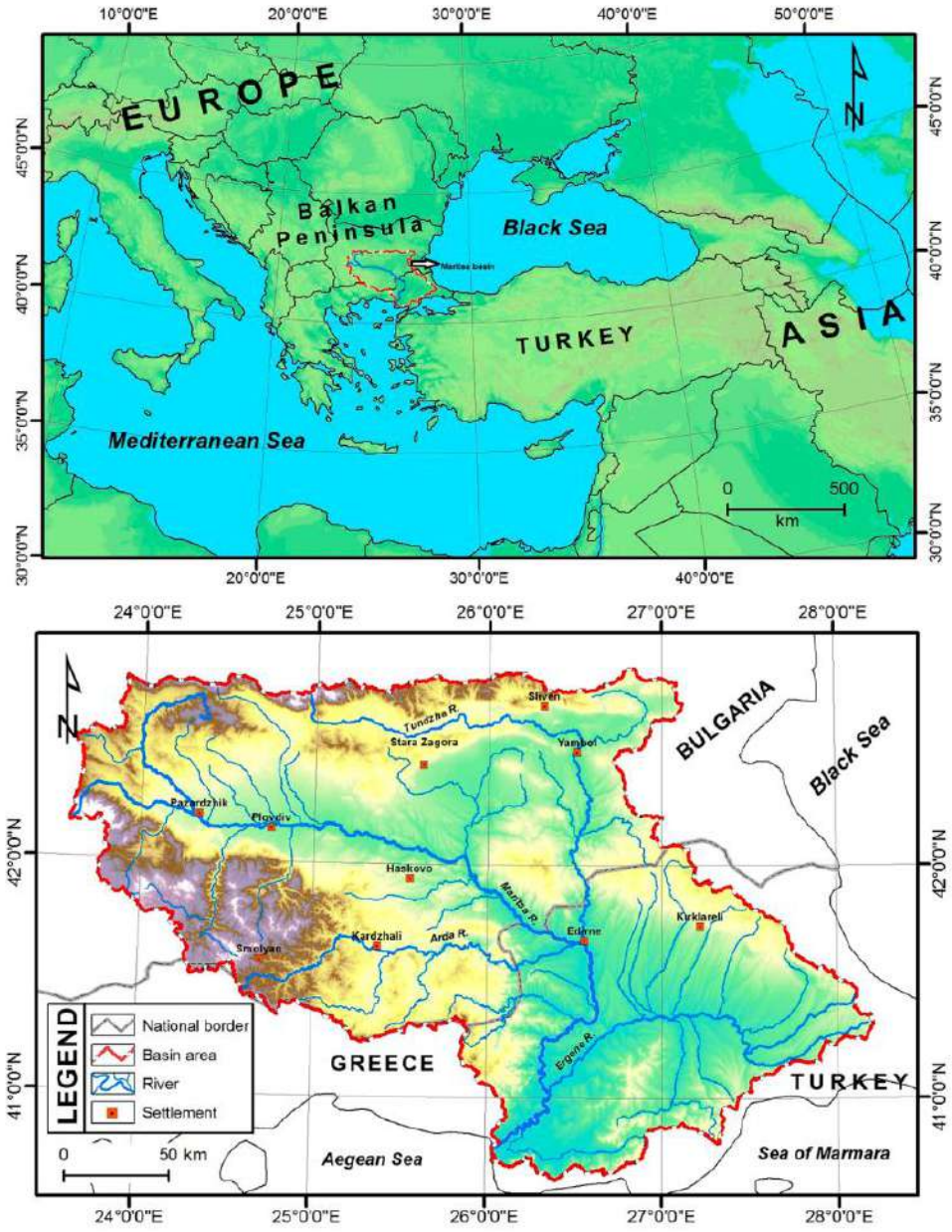



**Figure 48: Location of the Meriç-Ergene River Basin and its Network**[37]

## The Marmara Basin

The Marmara Basin is surrounded by Meriç-Ergene Basin in the North-West, The Black Sea in the North-East and the Susurluk and Northern Aegean Basins in the south. Koru Mountain, Ganos Mountain and Istranca Mountains define the boundary of the Marmara and Meriç-Ergene Basins. On the west side of the Anatolian part of the Marmara Basin, Kayalı Mountain, Kaz Mountain and Kara Mountain define the basin boundaries between Marmara, Northern

[37] Ozsahin, Duru & Eroglu (2018), Land Use and Land Cover Changes (LULCC), a Key to Understand Soil Erosion Intensities in the Maritsa Basin, Water.

Aegean and Susurluk Basins. On the other hand, Avdan Mountain, Uludağ, Katırlı Mountain and Aydos Mountain are the boundaries in the eastern Anatolian part. The total area of the Marmara Basin is 23,084.64 ha[38], including artificial areas, agricultural areas, forest and semi-natural areas, wet areas, and water bodies.

Streams in the part of basin in Thrace do not accumulate in a single large tributary and discharge into the Marmara Sea from a single pourpoint. Instead, they are mostly discharging into the Marmara Sea from dozens of pourpoints as small tributaries. This part covers an area of approximately 9,083 km$^2$. The longest stream in this part of the basin is Mutlu River (Rezovo River), which forms the border between Türkiye and Bulgaria, flows from west to east and drains into the Black Sea (Figure 49). It is 112 km long and its source is in the Turkish part of the Strandzha mountains east of Kofçaz in Türkiye under the Turkish name of Paspalderesi. It generally flows east from Türkiye to Bulgaria, and after Paspala village of Kırklareli Province in Türkiye becomes a border river between Türkiye and Bulgaria until its mouth in the Black Sea at Rezovo. This location constitutes the southernmost point of the Bulgarian Black Sea Coast and the northernmost point of the Turkish one, as well as the southeasternmost point of Bulgaria and the north easternmost point of Turkish Thrace. The Mutlu River's catchment spreads over 739 km$^2$, of which 555 km$^2$ are in Türkiye, and 184 km$^2$ in Bulgaria. Armağandere, Ayazma Istrancadere, Kazandere, Kanlıdere, Kocadere, Kule and Pabuçdere are the other perennial streams with significant flow rates in this part. In addition, well-known water bodies such as Büyükçekmece and Küçükçekmece lagoons, Terkos Dam Lake and Pabuçdere Dam Lake are also here.




**Figure 49: Mutlu River Basin[39]**

[38] Ministry of Agriculture and Forestry, General Directorate of Water Management. (2023). The Final Report of Determining the Scope and Content of the Strategic Environmental Assessment in the Marmara Basin. Ankara: Ministry of Agriculture and Forestry, General Directorate of Water Management.

[39] Öziş, Ü., Harmancıoğlu, N., & Özdemir, Y. (2006). Transboundary River Basins. In N. Harmancıoğlu, & D. Altınbilek, Transboundary River Basins (pp. 399–444). Springer.

The area of the eastern part of the basin on the Anatolian side is approximately 7,664 km$^2$. The most important stream on the Anatolian side of Istanbul is the Riva (Çayağazı) Stream. This 100 km long stream originates in Samandıra and flows into the Black Sea. Ömerli Dam, which is used for drinking water, is on this stream. In the same region, there is the 50 km Darlık (Hiciv) Stream, which has a very high flow rate and flows into the sea near Şile. Around the Gulf, the 12 km Dilovası (Tavşanlı) Stream, Kirazdere, which originates from the Samanlı Mountains and flows into the Marmara Sea, Yalakdere and Karsak Streams are some of them. Apart from these, İznik Lake, which forms a closed sub-basin, is also an important part of the basin. Lake Iznik, the fifth largest natural lake in Türkiye, is also the largest lake in the Marmara Region with a surface area of 298 km$^2$. Many streams are accumulated from the area and flow into the lake within 1,384 km$^2$ drainage of itself[40].

The southwestern part of the basin on the Anatolian side has an area of approximately 6,752 km². Biga, Çan, Çanakkale, Gönen, Koca and Umurbey streams and Değirmen, Kaz (Kocabaş) streams are the major perennial streams of the basin. The Biga River is the longest in the region with an 80 km length and a drainage area of 4155,9 km$^2$ in southwestern Marmara. After the merger of many small streams, it collects the accumulated water at the Biga plain and flows into the sea. Gönen Stream, the second longest in that part of the basin, is formed by the merger of smaller streams draining the surface waters of the mountains. After collecting water from a 2156,2 km$^2$ drainage area, it flows into the sea at the Gulf of Erden[5].

The location map of both basins and surface water bodies is on Figure 50.

[40] Ministry of Agriculture and Forestry, General Directorate of Water Management. (2023). The Final Report of Determining the Scope and Content of the Strategic Environmental Assessment in the Marmara Basin. Ankara: Ministry of Agriculture and Forestry, General Directorate of Water Management.

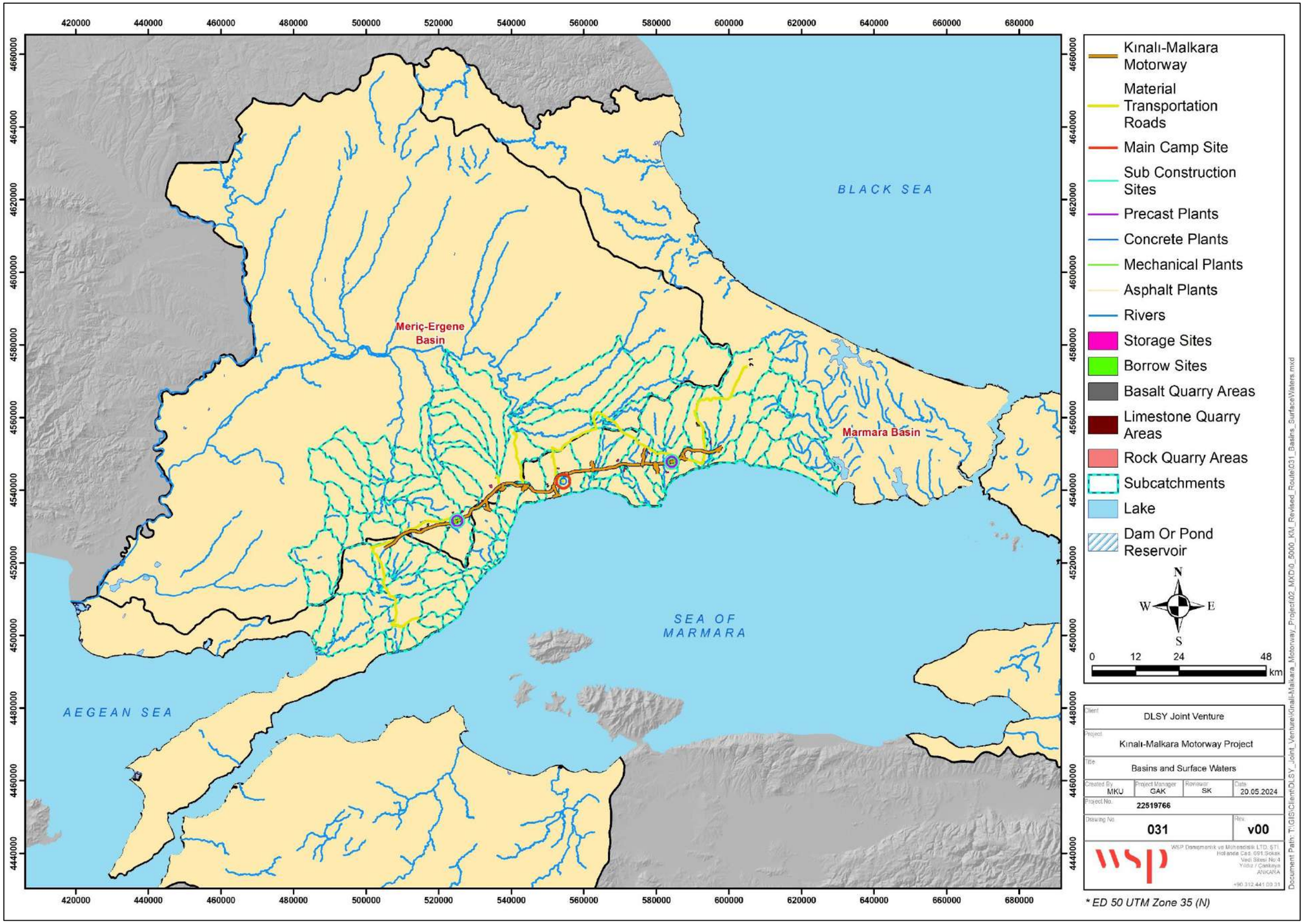



**Figure 50: Meriç-Ergene Basin and Marmara Basin**

#### 6.1.6.2 Local Content

In order to identify the drainage network in the Project Area, catchment areas were identified using Digital Elevation Model (DEM) obtained from Shuttle Radar Topography Mission (SRTM). According to this, the drainage network is divided into thirty-seven catchments according to the creeks in and around it (Figure 51). The sub-catchments and their physical characteristics such as maximum elevation, minimum elevation, average elevation, and slope grades are presented in Table 46.

The riverbed directions in the Project Area are generally towards the north, south, northeast, and southwest and they are drained into the Marmara Sea. In general, seasonal streams that do not show continuous flow are predominant along the Project Route. Kula Stream, Demirkova Stream, Çanta Stream, Kınıklı Stream and Seymen Stream fed from the sources located in the north of the Project Area, close to the watershed boundary and the wastewater of the existing settlements[41] along the flow path, are the most significant perennial streams. However, there are no stream gauges on these streams showing continuous flow. Streams in the impact area along the Project Route are given in the Table 47.

[41] Meriç Ergene and Marmara Basins Drought Management Plan Project, Marmara Basin Drought Management Plan Strategic Environmental Assessment Scoping Report, General Directorate of Water Management (GDWM), May 2022. & Meriç Ergene and Marmara Basins Drought Management Plan Project, Meriç-Ergene Basin Drought Management Plan Strategic Environmental Assessment Scoping Report, General Directorate of Water Management (GDWM), May 2022.

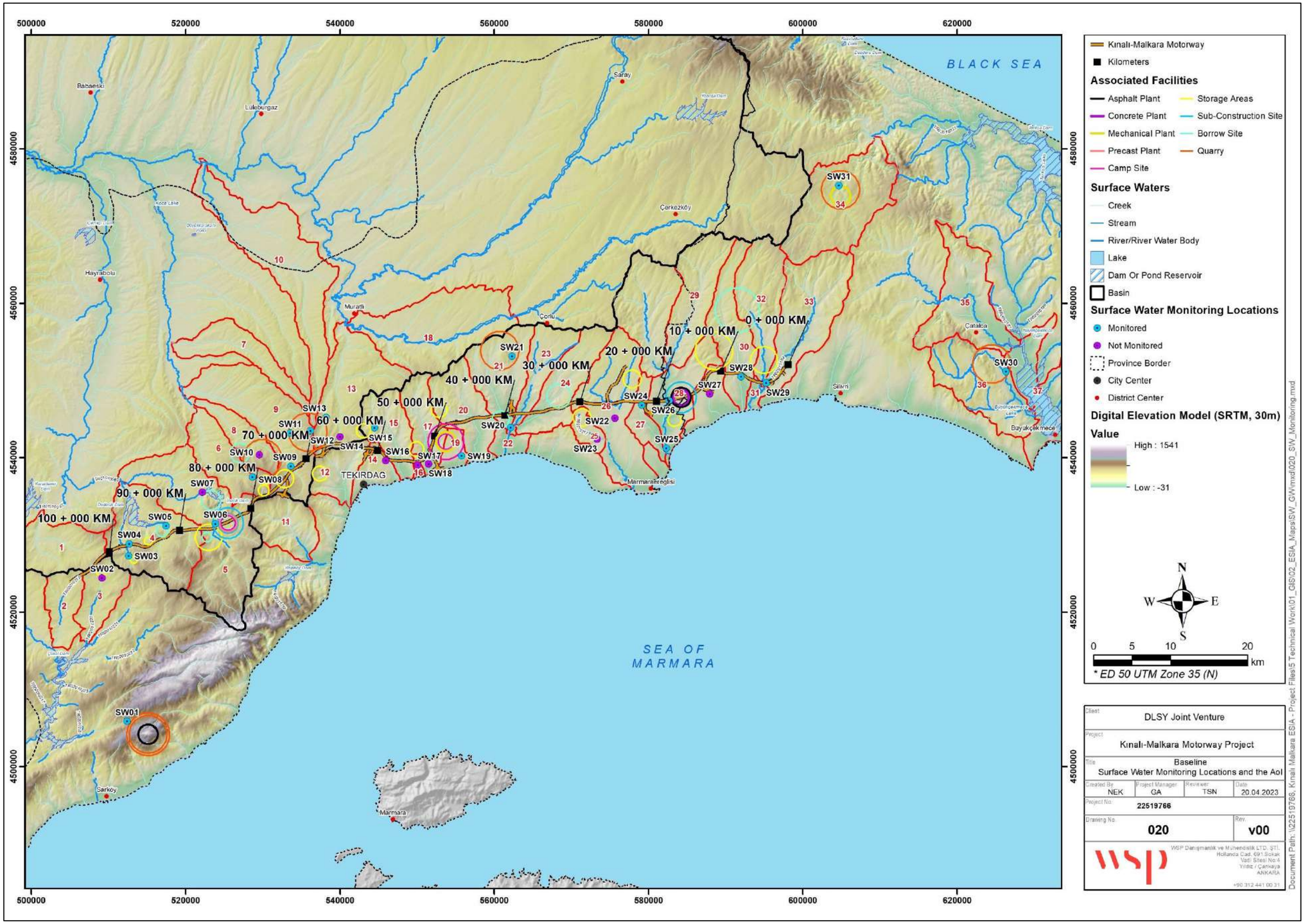



**Figure 51: Catchments Intersecting the Project Area**

**Table 46: Physical Properties of Sub-Catchments**

| Catchment ID | Area ($km^2$) | Elevation (m ASL) | | | Slope Degree (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Minimum | Maximum | Mean | 0º - 10º | 10º - 20º | 20º - 30º | 30º - 40º | >40º |
| 1 | 63.39 | 82 | 301 | 162.23 | 7.41% | 92.59% | 0.00% | 0.00% | 0.00% |
| 2 | 39.73 | 89 | 257 | 158.26 | 14.29% | 85.71% | 0.00% | 0.00% | 0.00% |
| 3 | 43.87 | 87 | 322 | 170.15 | 5.88% | 94.12% | 0.00% | 0.00% | 0.00% |
| 4 | 116.78 | 89 | 382 | 203.48 | 12.10% | 86.29% | 1.61% | 0.00% | 0.00% |
| 5 | 180.08 | 90 | 827 | 214.60 | 15.56% | 71.48% | 11.11% | 1.85% | 0.00% |
| 6 | 61.61 | 88 | 333 | 190.33 | 8.51% | 91.49% | 0.00% | 0.00% | 0.00% |
| 7 | 56.24 | 63 | 248 | 142.68 | 14.29% | 85.71% | 0.00% | 0.00% | 0.00% |
| 8 | 37.86 | 88 | 335 | 186.45 | 12.50% | 87.50% | 0.00% | 0.00% | 0.00% |
| 9 | 128.76 | 76 | 329 | 170.07 | 2.94% | 97.06% | 0.00% | 0.00% | 0.00% |
| 10 | 165.48 | 34 | 264 | 105.08 | 40.74% | 59.26% | 0.00% | 0.00% | 0.00% |
| 11 | 53.52 | 9 | 335 | 157.13 | 4.26% | 95.74% | 0.00% | 0.00% | 0.00% |
| 12 | 39.66 | -1 | 279 | 117.26 | 3.70% | 96.30% | 0.00% | 0.00% | 0.00% |
| 13 | 105.15 | 71 | 278 | 171.78 | 13.51% | 86.49% | 0.00% | 0.00% | 0.00% |
| 14 | 23.19 | 0 | 246 | 99.66 | 12.50% | 87.50% | 0.00% | 0.00% | 0.00% |
| 15 | 51.18 | 3 | 256 | 108.50 | 1.56% | 98.44% | 0.00% | 0.00% | 0.00% |
| 16 | 3.09 | 7 | 127 | 62.40 | 50.00% | 50.00% | 0.00% | 0.00% | 0.00% |
| 17 | 45.75 | 0 | 246 | 100.51 | 2.94% | 97.06% | 0.00% | 0.00% | 0.00% |
| 18 | 147.93 | 70 | 246 | 132.21 | 3.70% | 96.30% | 0.00% | 0.00% | 0.00% |
| 19 | 14.58 | 1 | 173 | 72.31 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 20 | 67.21 | -1 | 243 | 97.18 | 4.76% | 95.24% | 0.00% | 0.00% | 0.00% |
| 21 | 73.29 | 1 | 217 | 87.99 | 4.55% | 95.45% | 0.00% | 0.00% | 0.00% |
| 22 | 13.88 | -1 | 127 | 32.54 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 23 | 44.79 | 2 | 202 | 99.23 | 12.50% | 87.50% | 0.00% | 0.00% | 0.00% |
| 24 | 65.85 | 6 | 218 | 104.94 | 17.65% | 82.35% | 0.00% | 0.00% | 0.00% |
| 25 | 15.22 | 38 | 165 | 107.13 | 40.00% | 60.00% | 0.00% | 0.00% | 0.00% |
| 26 | 114.13 | -1 | 228 | 93.09 | 28.57% | 71.43% | 0.00% | 0.00% | 0.00% |
| 27 | 23.84 | -1 | 135 | 66.39 | 33.33% | 66.67% | 0.00% | 0.00% | 0.00% |
| 28 | 65.03 | -1 | 250 | 73.49 | 13.79% | 86.21% | 0.00% | 0.00% | 0.00% |

| Catchment ID | Area ($km^2$) | Elevation (m ASL) | | | Slope Degree (%) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Minimum | Maximum | Mean | 0º - 10º | 10º - 20º | 20º - 30º | 30º - 40º | >40º |
| 29 | 82.22 | 30 | 237 | 131.85 | 14.29% | 85.71% | 0.00% | 0.00% | 0.00% |
| 30 | 73.26 | 0 | 252 | 116.70 | 9.68% | 90.32% | 0.00% | 0.00% | 0.00% |
| 31 | 7.74 | 1 | 81 | 21.60 | 100.00% | 0.00% | 0.00% | 0.00% | 0.00% |
| 32 | 79.26 | 10 | 258 | 147.39 | 2.08% | 97.92% | 0.00% | 0.00% | 0.00% |
| 33 | 112.07 | 8 | 253 | 116.30 | 1.04% | 98.96% | 0.00% | 0.00% | 0.00% |
| 34 | 134.26 | 42 | 360 | 202.27 | 27.08% | 55.21% | 17.19% | 0.52% | 0.00% |
| 35 | 104.70 | 3 | 323 | 104.89 | 19.21% | 66.23% | 14.57% | 0.00% | 0.00% |
| 36 | 99.03 | 2 | 319 | 123.35 | 18.75% | 71.43% | 9.82% | 0.00% | 0.00% |
| 37 | 132.94 | -2 | 204 | 65.67 | 5.17% | 94.83% | 0.00% | 0.00% | 0.00% |
| * m ASL: meters Above Sea Level | | | | | | | | | |

**Table 47: River/Stream Crossings of the Project Route**

| Name | Km |
|---|---|
| Kula River | 1+875 |
| Tatlı River | 3+576 |
| Çanta River | 6+487 |
| Ephemeral Stream | 7+484 |
| Ephemeral Stream | 9+396 |
| Ephemeral Stream | 9+593 |
| Ephemeral Stream | 10+264 |
| Ephemeral Stream | 11+387 |
| Ephemeral Stream | 11+387 |
| Kumlubağ River | 17+818 |
| Intermittent Stream | 20+980 |
| Intermittent Stream | 21+148 |
| Ephemeral Stream | 22+909 |
| Intermittent Stream | 23+826 |
| Anaç River | 24+875 |
| Ephemeral Stream | 25+504 |
| Ephemeral Stream | 26+210 |

| Name | Km |
|---|---|
| Ephemeral Stream | 27+207 |
| Ephemeral Stream | 28+116 |
| Intermittent Stream | 29+039 |
| Intermittent Stream | 34+095 |
| Köprüce River | 34+625 |
| Ephemeral Stream | 34+796 |
| Ephemeral Stream | 34+893 |
| Ephemeral Stream | 35+387 |
| Intermittent Stream | 37+019 |
| Intermittent Stream | 39+159 |
| Ephemeral Stream | 39+902 |
| Ephemeral Stream | 41+471 |
| Ephemeral Stream | 42+048 |
| Ephemeral Stream | 42+780 |
| Seymen River | 43+330 |
| Ephemeral Stream | 44+258 |
| Ephemeral Stream | 45+139 |
| Ephemeral Stream | 45+951 |
| Ephemeral Stream | 46+726 |
| Intermittent Stream | 49+225 |
| Intermittent Stream | 50+404 |
| Intermittent Stream | 52+052 |
| Intermittent Stream | 53+541 |
| Intermittent Stream | 56+068 |
| Intermittent Stream | 58+820 |
| Intermittent Stream | 60+698 |
| Intermittent Stream | 61+323 |
| Intermittent Stream | 61+462 |
| Ephemeral Stream | 62+094 |
| Ephemeral Stream | 62+863 |
| Ephemeral Stream | 64+023 |
| Intermittent Stream | 64+445 |

| Name | Km |
|---|---|
| Intermittent Stream | 64+907 |
| Intermittent Stream | 65+152 |
| Intermittent Stream | 65+380 |
| Intermittent Stream | 66+828 |
| Ephemeral Stream | 67+711 |
| Ephemeral Stream | 68+264 |
| Ephemeral Stream | 68+581 |
| Ephemeral Stream | 69+699 |
| Tekke River | 71+459 |
| Ephemeral Stream | 72+719 |
| Ephemeral Stream | 72+893 |
| Ephemeral Stream | 72+969 |
| Ephemeral Stream | 73+538 |
| Ephemeral Stream | 73+584 |
| Ephemeral Stream | 74+034 |
| Ephemeral Stream | 74+458 |
| Ephemeral Stream | 74+725 |
| Ephemeral Stream | 75+160 |
| Ephemeral Stream | 75+611 |
| Ephemeral Stream | 76+413 |
| Intermittent Stream | 77+159 |
| Intermittent Stream | 77+898 |
| Ephemeral Stream | 79+630 |
| Ephemeral Stream | 80+030 |
| Intermittent Stream | 80+225 |
| Ephemeral Stream | 81+294 |
| Ephemeral Stream | 81+874 |
| Ephemeral Stream | 82+346 |
| Ephemeral Stream | 83+370 |
| Ephemeral Stream | 84+042 |
| Sarıyer River | 84+701 |
| Ephemeral Stream | 87+151 |

| Name | Km |
|---|---|
| Intermittent Stream | 88+086 |
| Intermittent Stream | 88+993 |
| Ephemeral Stream | 89+239 |
| Intermittent Stream | 90+883 |
| Köprübaşı River | 91+585 |
| Intermittent Stream | 91+854 |
| Intermittent Stream | 92+137 |
| Intermittent Stream | 92+225 |
| Ephemeral Stream | 92+536 |
| Intermittent Stream | 92+711 |
| Intermittent Stream | 94+037 |
| Intermittent Stream | 94+259 |
| Intermittent Stream | 94+483 |
| Intermittent Stream | 95+151 |
| Ephemeral Stream | 95+255 |
| Intermittent Stream | 96+014 |
| Intermittent Stream | 96+177 |
| Ephemeral Stream | 96+474 |
| Intermittent Stream | 97+006 |
| Intermittent Stream | 97+881 |
| Intermittent Stream | 98+197 |
| Intermittent Stream | 100+727 |
| Ephemeral Stream | 102+275 |
| Intermittent Stream | 104+466 |
| Çayırlar River | 105+143 |

#### *6.1.6.3 Hydrometeorological Conditions*

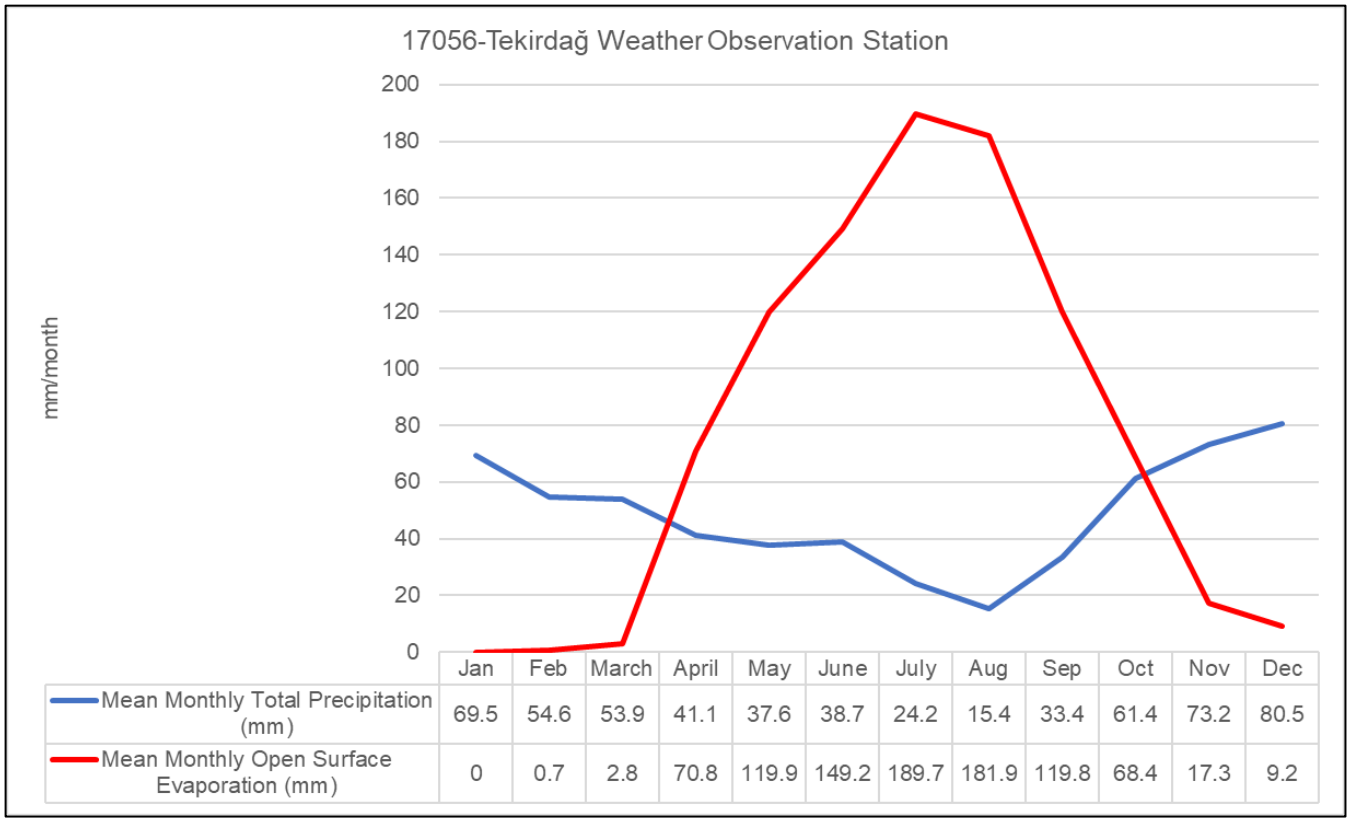
Since the 17056-Tekirdağ Weather Observation Station is 6 km south of the Project Area and near the Marmara Sea, it is assumed that it could represent the climatic conditions of the part of the Project Area in the northern part of the Marmara Basin. The recorded data in the 17056-Tekirdağ Merkez Station is available between 1940 and 2021 (81 years of data). Meanwhile, the 17634-Malkara station can represent the part of the Project Area in the Meriç-Ergene basin as it is 13 km away from the Project Area and near the Meriç-Ergene – North Marmara Basins'

boundaries. The recorded data in the 17634-Malkara Station is available between 1980 and 2021 (41 years of data). The information regarding the meteorological stations is given in Table 48.

Using long-term average monthly precipitation and open surface evaporation data (Figure 52 and Figure 53), the water surplus and deficit has calculated for both observation stations. Accordingly, both water budgets have positive water amounts (surplus) between January-March and October-December while the remaining months of a year have negative water amounts (deficit) in a year as shown in Figure 54 and Figure 55.

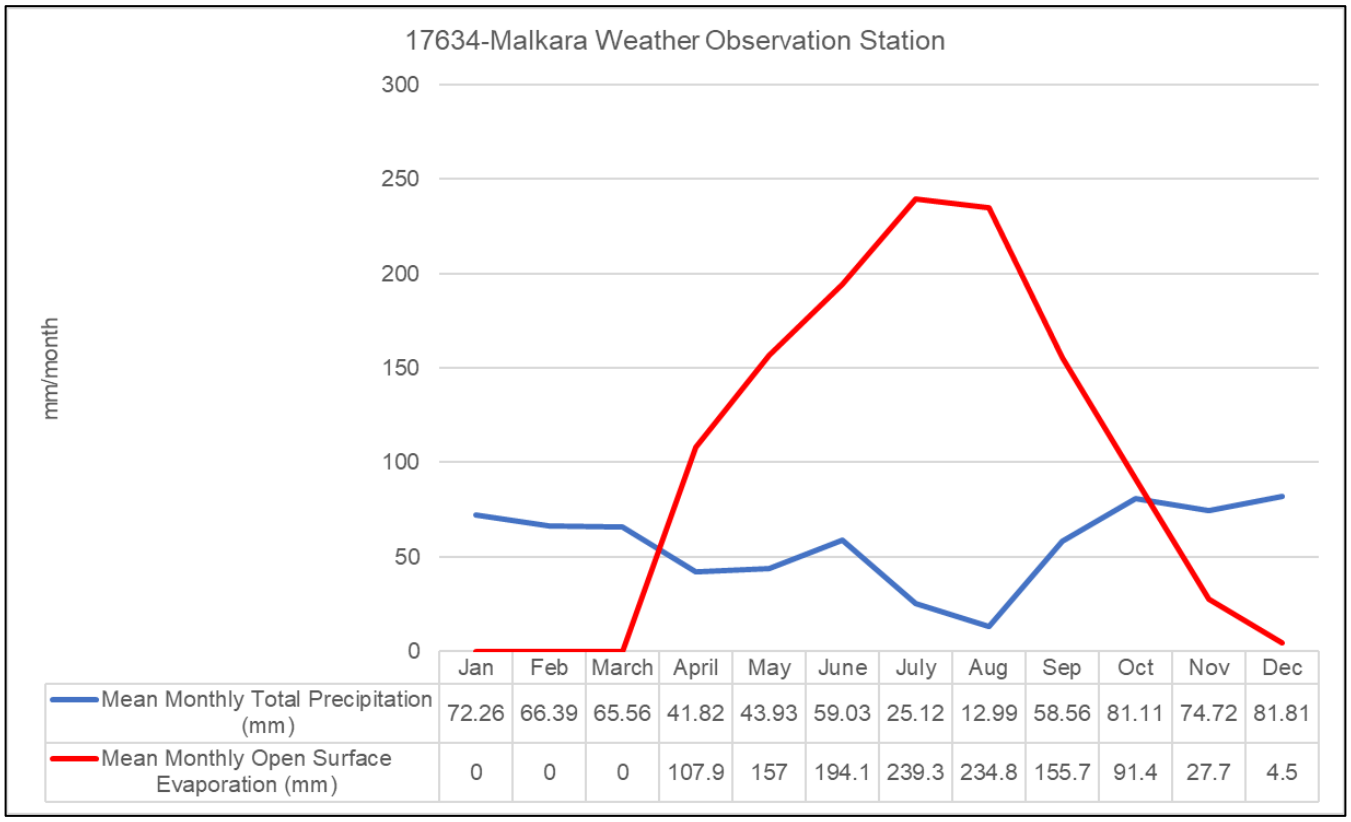
**Table 48: Information on Nearby Meteorological Station**

| Station Number | Station Name | Longitude | Latitude | Elevation (m ASL) | Data Interval | Approx. Distance to the Project Area | Basin Name |
|---|---|---|---|---|---|---|---|
| 17056 | Tekirdağ - Merkez | 27.497 | 40.9585 | 4.0 | 1940-2021 | 6 km | Marmara |
| 17634 | Malkara | 26.908 | 40.8873 | 207.0 | 1980-2021 | 13 km | Ergene |
| ASL: Above Sea Level | | | | | | | |




| | Jan | Feb | March | April | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Monthly Total Precipitation (mm) | 69.5 | 54.6 | 53.9 | 41.1 | 37.6 | 38.7 | 24.2 | 15.4 | 33.4 | 61.4 | 73.2 | 80.5 |
| Mean Monthly Open Surface Evaporation (mm) | 0 | 0.7 | 2.8 | 70.8 | 119.9 | 149.2 | 189.7 | 181.9 | 119.8 | 68.4 | 17.3 | 9.2 |

**Figure 52: Precipitation and Evaporation Graph for 17056-Tekirdağ Weather Observation Station**




| | Jan | Feb | March | April | May | June | July | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mean Monthly Total Precipitation (mm) | 72.26 | 66.39 | 65.56 | 41.82 | 43.93 | 59.03 | 25.12 | 12.99 | 58.56 | 81.11 | 74.72 | 81.81 |
| Mean Monthly Open Surface Evaporation (mm) | 0 | 0 | 0 | 107.9 | 157 | 194.1 | 239.3 | 234.8 | 155.7 | 91.4 | 27.7 | 4.5 |

**Figure 53: Precipitation and Evaporation Graph for 17634-Malkara Weather Observation Station**

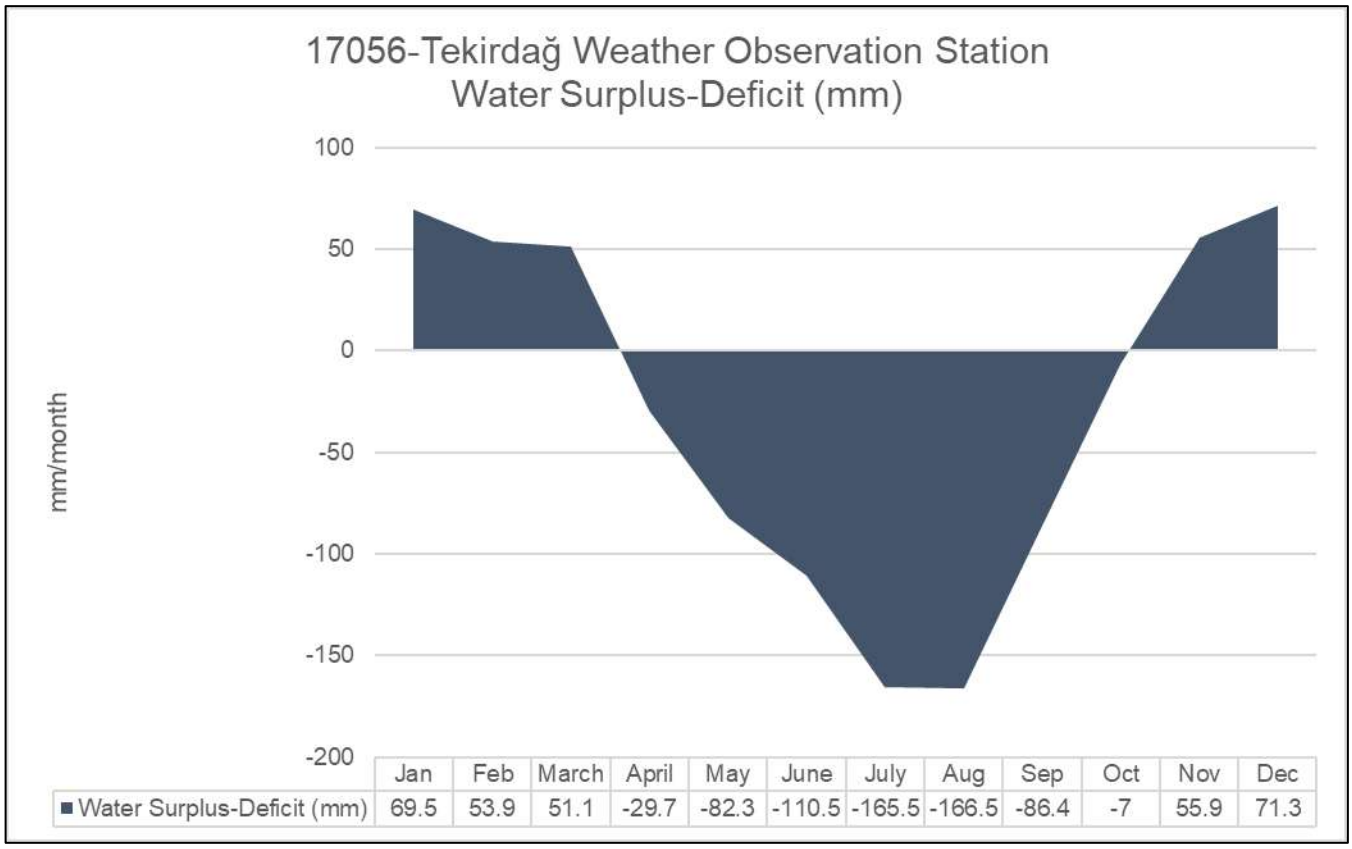



**Figure 54: Water Surplus and Deficit Graph for 17056-Tekirdağ Weather Observation Station**

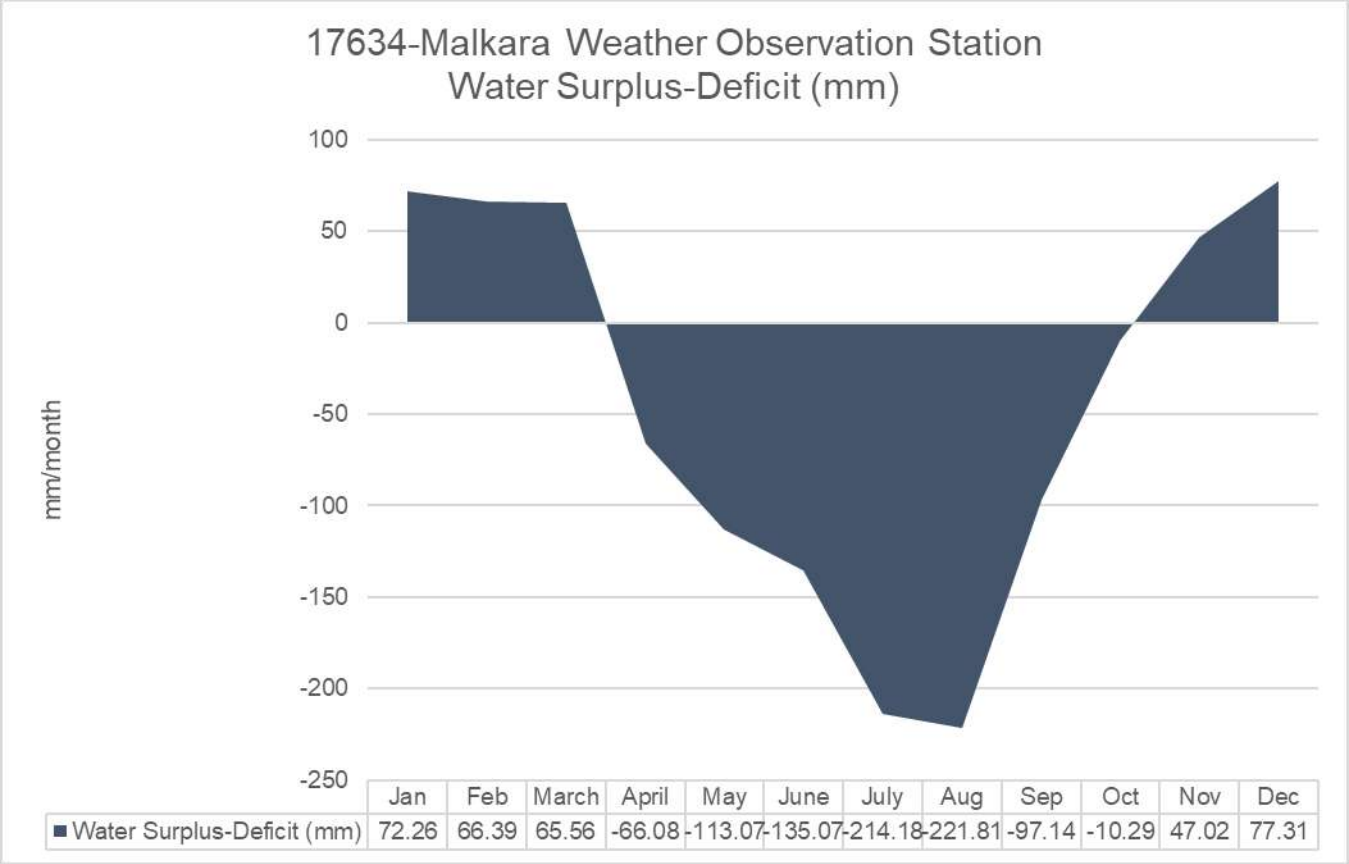



**Figure 55: Water Surplus and Deficit Graph for 17634-Malkara Weather Observation Station**

### *6.1.6.4 Baseline Surface Water Quality*

A sampling program was planned for 30 locations within the Project Area and its vicinity to assess baseline water quality. During the field studies, 8 of these locations were found to be dry, and 1 location was not sampled because the SW point was on a private land. Parameters were compared against surface water quality, drinking water quality, and irrigation standards. Laboratory analyses were conducted by TÜRKAK accredited ENCON Laboratory. All measurements and samples were collected by trained personnel who completed the Water and Wastewater Sampling Training organized by the MoEUCC.

Table 49 displays the coordinates of the sampling points alongside the measurements and analyses conducted at each location.

**Table 49: Basic Information on Surface Water Sampling Points**

| Monitoring Point | Coordinates (ED50 UTM Zone 35N) | | | Description |
|---|---|---|---|---|
| | X | Y | Z (m) | |
| SW-1 | 512425.28 | 4505858.24 | 242.26 | It is on the River Water Body coded TR02010226, which flows into the Çokal Dam (supplies drinking water), 7.5 km west of Tepeköy Quarry. |
| SW-2(1) | 509169.6 | 4524436.82 | 142.02 | It is on the Taşlıgeçit Creek and close to Depot-16 (Ahievran). |
| SW-3 | 512607.62 | 4527270.83 | 169.98 | It is on the River Water Body coded T01010083 and near the Borrow Pit-15 and Depot-15. |
| SW-4 | 512682.62 | 4528849.84 | 165.82 | It is on a creek draining into the River Water Body coded TR01010083 |
| SW-5 | 517451.65 | 4531188.85 | 135.53 | It is on the River Water Body coded T01010082 and near the Borrow Pit-7. |
| SW-6 | 523851.69 | 4531458.84 | 147.22 | It is on the River Water Body coded T01010080 and near the Concrete Batch Plant-3, Construction Site Facilities-2 and Concrete Beam Precast Site-2. |
| SW-7 | 522172.69 | 4535527.87 | 133.77 | It is on the River Water Body coded T01010081 (Bent Creek), and near the Borrow Pit-5. |
| SW-8 | 528686.73 | 4537509.87 | 187.03 | It is on the Yılancıova Creek and near the Bıyıkali Basalt Quarry. |
| SW-9 | 533638.75 | 4538895.87 | 158.05 | It is on the tributary flowing towards Ana Creek (TR01010079), and near Depot-10 (Seymenli) and Bıyıkali Basalt Quarry. |
| SW-10(2) | 529565.73 | 4540396.88 | 273.31 | It is on the tributary flowing towards Ağıl Creek, and inside of the Bıyıkali Basalt Quarry. |
| SW-11 | 533561.76 | 4543182.89 | 153.71 | It is on the tributary flowing towards Ana Creek (TR01010079), and near the Osmanlı Basalt Quarry. |
| SW-12 | 536175.77 | 4543488.89 | 249.23 | It is on the Aydın Creek and inside of the Osmanlı Basalt Quarry |
| SW-13 | 538210.79 | 4545188.9 | 153.55 | It is on the Çeşme Creek and near the Osmanlı Basalt Quarry |
| SW-14(1) | 540034.8 | 4542716.88 | 169.16 | It is on the tributary flowing towards Çorlu Stream (TR01010039), and near the Osmanlı Basalt Quarry. |
| SW-15 | 544472.82 | 4543828.88 | 102.55 | It is on a creek flowing towards the Marmara Sea directly and approximately 500 m east of Depot-8 (Yenişehir). |
| SW-16(1) | 545952.82 | 4539651.86 | 67.64 | It is on a creek flowing towards the Marmara Sea directly and approximately 250 m away from the main route. |

| Monitoring Point | Coordinates (ED50 UTM Zone 35N) | | | Description |
|---|---|---|---|---|
| | X | Y | Z (m) | |
| SW-17(1) | 550072.85 | 4539078.85 | 60.4 | It is on a creek flowing towards the Marmara Sea directly and approximately 350 m south of the main route. |
| SW-18(1) | 551512.85 | 4539203.85 | 8.34 | It is on a creek flowing towards the Marmara Sea directly and approximately 850 m south of the main route. |
| SW-19 | 555752.88 | 4540245.85 | 37.93 | It is on a creek flowing towards the Marmara Sea directly and approximately 2,5 km south of the Main Camp Area, Concrete Batch Plant-2, Concrete Beam Precast Site-1 and Mechanical Plant Site-2. |
| SW-20 | 562141.92 | 4543875.86 | 4.37 | It is on the tributary flowing towards Değirmen Creek (TR02010211), and near the Borrow Pit-3 (Yenice). |
| SW-21 | 562306.93 | 4553125.91 | 154.37 | It is on the tributary flowing towards Değirmen Creek (TR02010211), and near the Karatepe Basalt Quarry. |
| SW-22(1) | 575637.99 | 4545077.85 | 44.36 | It is on the Kum Creek (TR02010316) which is one of the tributaries of the Bağlardere Creek (TR02010318) flowing towards the Marmara Sea directly. |
| SW-23(1) | 573344.98 | 4542428.83 | 54.54 | It is on the river water body coded TR02010317 which is one of the tributaries of the Bağlardere Creek (TR02010318). |
| SW-24 | 579149.01 | 4546780.85 | 53.43 | It is on the tributary flowing towards Esetce Creek (TR02010210) flowing towards the Marmara Sea, and approximately 450 km south of the main route. |
| SW-25 | 582333.03 | 4541234.82 | 1.42 | It is on the tributary flowing towards Esetce Creek (TR02010210) flowing towards the Marmara Sea, which is around 1 km southeast. |
| SW-26 | 582700.03 | 4547374.85 | 18.59 | It is on the tributary flowing towards Esetce Creek (TR02010210) flowing towards the Marmara Sea, and near the both main route and Concrete Batch Plant-1. |
| SW-27(1) | 587936.06 | 4548245.85 | 56.68 | It is on a creek flowing towards the Marmara Sea directly and approximately 250 m south of the Çanta interchange 2. |
| SW-28 | 592004.09 | 4550486.86 | 21.52 | It is on a creek flowing towards the Marmara Sea directly and approximately 400 m south of the main route. |
| SW-29 | 595266.11 | 4549646.85 | 11.43 | It is on the river water body coded TR02010184 which flows towards the Marmara Sea directly. |
| SW-30 | 626347.28 | 4551139.82 | 29.13 | It is on the Koğuk Creek (TR02010185) and inside of the Çatalca-Çakılköy Quarry. |

| Monitoring Point | Coordinates (ED50 UTM Zone 35N) | | | Description |
|---|---|---|---|---|
| | X | Y | Z (m) | |
| Notes:<br>(1) These locations were observed as dry.<br>(2) SW-10 could not be sampled as it is located in a private mine. | | | | |

### *Flow Rate Measurements*

Since there are no stream gauge was built on the streams around the Project Area, flow rate measurements were carried out in March 2023 within the scope of the sampling studies. Measurements could be made at five locations, namely SW-7, SW-25, SW-26, SW-28 and SW-29 using a current-meter since the river water levels were sufficient enough for the measurement at only these points. The information on these measurements is given in Table 50.

**Table 50: In-Situ Flow Rate Measurements**

| ID | Coordinates (ED50 UTM Zone 35N) | | Flow Rate ($m^3/s$) |
|---|---|---|---|
| | X | Y | |
| SW-7 | 522172.69 | 4535527.87 | 0.0018 |
| SW-25 | 582333.03 | 4541234.82 | 0.0235 |
| SW-26 | 582700.03 | 4547374.85 | 0.0266 |
| SW-28 | 592004.09 | 4550486.86 | 0.0274 |
| SW-29 | 595266.11 | 4549646.85 | 0.1380 |

### *In-Situ Measurements*

pH, Temperature, Electrical Conductivity, Oxidation-Reduction Potential (ORP) and Dissolved Oxygen were measured by using a multiparameter water quality meter (Table 51). According to these measurements, pH values ranged from 8.08 to 9.23. The average temperature recorded was 9.3°C, with the lowest and highest values being 6.8°C and 13.0°C, respectively. The range of electrical conductivity (EC) values was between 213 and 2180 µS/cm, with an average of 1032.1 µS/cm. Despite this, the standard deviation of 441 indicates that about two thirds of the samples fall between 591 and 1473 µS/cm. Dissolved oxygen (DO) values varied between 2.3 and 10.2 mg/L, and oxidation-reduction potential (ORP) values ranged from 114 to 330.3 mV, with an average of 211.35 mV.

**Table 51: In-situ Measurements of Surface Water Sampling Points**

| Monitoring Point | pH | Temperature (°C) | Electrical Conductivity (µS/cm) | Oxidation Reduction (Redox) Potential (ORP) (mV) | Dissolved Oxygen (mg/L) |
|---|---|---|---|---|---|
| SW-1 | 8.08 | 6.8 | 1527 | 191.8 | 9.7 |
| SW-3 | 8.25 | 7.5 | 980 | - | 9.8 |
| SW-4 | 8.12 | 8.4 | 1079 | - | 7.3 |
| SW-5 | 8.29 | 9.9 | 922 | - | 7.3 |
| SW-6 | 8.55 | 7.6 | 867 | 114.0 | 7.7 |
| SW-7 | 8.45 | 9.8 | 946 | - | 8.9 |
| SW-8 | 8.65 | 12.6 | 632 | 160.2 | 10.2 |
| SW-9 | 8.48 | 11.7 | 1067 | - | 9.7 |
| SW-11 | 8.52 | 10.2 | 1068 | 218.1 | 8.5 |
| SW-12 | 8.5 | 9.9 | 1145 | - | 9.1 |
| SW-13 | 8.7 | 10.2 | 712 | - | 7 |
| SW-15 | 8.58 | 6.9 | 1500 | - | 6.1 |
| SW-19 | 8.47 | 7.5 | 571 | - | 7.5 |
| SW-20 | 8.54 | 8.2 | 591 | - | 8.5 |
| SW-21 | 9.23 | 9.1 | 213 | 330.3 | 9.8 |
| SW-24 | 8.25 | 8.5 | 2180 | - | 6.9 |
| SW-25 | 8.13 | 9.9 | 1576 | - | 2.3 |
| SW-26 | 8.17 | 13.0 | 1541 | - | 3.5 |
| SW-28 | 8.33 | 8.4 | 925 | - | 8.4 |
| SW-29 | 8.28 | 11.8 | 1168 | 253.7 | 8 |
| SW-30 | 8.73 | 7.3 | 464 | - | 9.4 |
| **Average** | **8.44** | **9.3** | **1032.1** | **211.35** | **7.89** |
| **Minimum** | **8.08** | **6.8** | **213** | **114** | **2.3** |
| **Maximum** | **9.23** | **13** | **2180** | **330.3** | **10.2** |
| **Standard Deviation** | **0.26** | **1.81** | **441.68** | **68.88** | **1.97** |

### *Water Quality*

The quality of surface water is determined by considering whether the measured values of the specified parameters exceed quality standards. Within the scope of this study, surface water quality standards, drinking water quality standards and irrigation water quality standards were used to examine surface water quality since they are widely used for not only tap water but also irrigational and industrial needs. In addition, hydro-chemical facies were determined by the Piper diagram.

- For the environmental quality standards,
  - "Surface Water Quality Regulation" (SWQR), Official Gazette No. 28483, Dated 30/11/2012 (Amended: OG-01/02/2023-32091),
- For drinking water quality standards,
  - "Regulation of Water intended for Human Consumption" (İTASHY), *Official Gazette* No: 25730, Dated: 17.02.2005 (Amended: OG-14/03/2023-31068),
  - "European Union (EU) Directive on the Quality of Water Intended for Human Consumption" no. 2020/2184, Dated: 16/12/2020,
- "Guidelines for Drinking Water Quality" developed by the World Health Organization (WHO), Dated: 21/03/2022. "Irrigation Water Standards" of the US Salinity Laboratory[42].

### Surface Water Quality Regulation (SWQR)

According to SWQR Article-1, the purpose of the regulation is to determine the biological, chemical, physicochemical and hydro-morphological qualities of surface water bodies and coastal-transitional waters; to provide classification thereof; to monitor the water quality and quantity thereof; to identify potential uses for such waters; to protect such waters; and to determine the measures to be adopted in order to achieve good water status. In this context, the water bodies are classified according to the criteria presented in Annex-5, Table-2 of the revised regulation. (Amended: OG-01/02/2023-32091).

**Water Quality Classes:** The intended use for the waters according to quality classes:

**Class I: High-quality water (Very Good)**

- High potential drinking water supply,
- Suitable for recreational purposes (including body contact, such as swimming),
- Suitable for trout farming, and
- Suitable for animal breeding and farming needs,

**Class II: Slightly polluted water (Good)**

- Potential drinking water supply,
- Suitable for recreational purposes,

[42] Richards, L. A. (1954). Diagnosis and Improvement of Saline and Alkali Soils. Washington D.C.: US Department of Agriculture.

- Suitable for fish farming other than trout,
- Irrigation water, provided that the water quality parameters comply with the criteria set forth in the legislation in force.

**Class III: Polluted water (Medium)**

- Can be used as water and industrial water for the production of aquaculture products after being subjected to suitable treatment, excluding facilities that require qualified water, such as food and textiles.

The laboratory results of the surface water samples collected within the Project Area and its vicinity were evaluated based on their quality classification using the Surface Water Quality Regulation (SWQR) Annex 5 Table 2. In addition, both Yearly Average and Maximum Permissible Environmental Quality Standards for Rivers/Lakes, which are given in Annex 5 Tables 4 and 5 of the SWQR, were also taken into account during the evaluation. Table 52 displays the Surface Water Quality Classification results in terms of General Chemical and Physicochemical Parameter Classes as per Annex 5 Table 2 of the SWQR, along with the sampling results. The results indicate that all samples had oil and grease concentrations exceeding the lower limit of Class-III (0,3 mg/L), and Total Kjeldahl Nitrogen and sulphur concentrations were above Class-III limits in 15 and 14 samples, respectively. BOD concentrations in seven (7) samples exceeded the Class-III limit (8 mg/L). Moreover, ten samples had Electrical Conductivity exceeding the Class-III limit (1000 µS/cm), while ten samples were within the Class-II range (400-1000 µS/cm).

Table 53 presents the Surface Water Quality Classification in terms of Specific Pollutants and Priority Substances to determine the Environmental Quality Standards as per Annex-5 Tables 4 and 5 of the SWQR, along with a comparison of the sampling results. The results of the monitoring in March 2023 show that aluminium concentrations exceeded the maximum quality standards at all monitoring points except SW-30. Additionally, iron, vanadium, and copper exceeded the maximum limits at 15, 14, and 11 locations, respectively. In addition, zinc concentrations in six (6) samples exceeded the maximum limits, whereas at three (3) and two (2) locations, lead and cobalt concentrations exceeded the same standards, respectively.

**Table 52: Assessment pf Surface Water Samples According to Surface Water Quality Regulation in terms of General Chemical and Physicochemical Parameter Classes (Annex-5 Table-2)**

| Parameters | Unit | Water Quality Class | | | Sampling Points | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | I (very good) | II (good) | III (medium) | SW-1 | SW-3 | SW-4 | SW-5 | SW-6 | SW-7 | SW-8 | SW-9 | SW-11 | SW-12 | SW-13 | SW-15 | SW-19 | SW-20 | SW-21 | SW-24 | SW-25 | SW-26 | SW-28 | SW-29 | SW-30 |
| Color (436 nm) | **$m^{-1}$** | RES 436nm: ≤1.5 | RES 436nm: 3.0 | RES 436nm: >4.3 | 1 | 0.28 | 0.32 | 0.28 | 0.4 | 0.40 | 0.04 | 1.04 | 0.28 | 0.76 | 0.32 | 18.72 | 1.84 | 0.40 | 0.64 | 1.28 | 0.84 | 0.72 | 0.04 | 1.08 | 0.00 |
| Color (525 nm) | **$m^{-1}$** | RES 525nm: ≤1.2 | RES 525nm: 2.4 | RES 525nm: >3.7 | 0.04 | 0.04 | 0.04 | 0.00 | 0.24 | 0.12 | 0.00 | 0.48 | 0.04 | 0.28 | 0.16 | 7.28 | 0.80 | 0.16 | 0.28 | 0.48 | 0.32 | 0.16 | 0.00 | 0.36 | 0.00 |
| Color (620 nm) | **$m^{-1}$** | RES 620nm: ≤0.8 | RES 620nm: 1.7 | RES 620nm: 2.5 | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.04 | 0.00 | 0.28 | 0.00 | 0.12 | 0.12 | 3.68 | 0.44 | 0.12 | 0.12 | 0.24 | 0.12 | 0.00 | 0.00 | 0.16 | 0.00 |
| pH | **-** | 6.0-9.0 | 6.0-9.0 | 6.0-9.0 | 8.08 | 8.25 | 8.12 | 8.29 | 8.55 | 8.45 | 8.65 | 8.48 | 8.52 | 8.5 | 8.70 | 8.58 | 8.47 | 8.54 | 9.23 | 8.25 | 8.13 | 8.17 | 8.33 | 8.28 | 8.73 |
| Electrical Conductivity | **µS/cm** | < 400 | 1000 | > 1000 | 1527.0 | 980.0 | 1079.0 | 922.0 | 867.0 | 946.0 | 632.0 | 1067.0 | 1068.0 | 1145 | 712.0 | 1500.0 | 571.0 | 591.0 | 213.0 | 2180.0 | 1576.0 | 1541.0 | 925.0 | 1168.0 | 464.0 |
| Oil and Grease *** | **mg/L** | < 0.2 | 0.3 | > 0.3 | 7.86 | 5.2 | 3.2 | 14.4 | 1.40 | 8.60 | 1.2 | 8.80 | 0.80 | 9.8 | 0.40 | 2.80 | 10.60 | 1.40 | 1.40 | 1.80 | 2.00 | 4.60 | 2.20 | 3.80 | 1.80 |
| Dissolved Oxygen | **mg/L** | > 8 | 6 | < 6 | 9.7 | 9.8 | 7.30 | 7.30 | 7.70 | 8.90 | 10.20 | 9.70 | 8.50 | 9.1 | 7.00 | 6.10 | 7.50 | 8.50 | 9.80 | 6.90 | 2.30 | 3.50 | 8.40 | 8.00 | 9.40 |
| Chemical Oxygen Demand (COD) | **mg/L** | < 25 | 50 | > 50 | 6.98 | <5.00 | 8.51 | 12.68 | 6.61 | 9.87 | 13.26 | 15.32 | 9.42 | 19.54 | 7.08 | 463.72 | 29.41 | 49.16 | 102.29 | 22.21 | 101.89 | 224.63 | 8.52 | 47.18 | 8.80 |
| Biochemical Oxygen Demand ($BOD_5$) | **mg/L** | < 4 | 8 | > 8 | <3.0 | <3.0 | <3.0 | 4.04 | <3.0 | <3.0 | 3.44 | 4.60 | 3.00 | 5.72 | <3.0 | 122.40 | 9.12 | 16.56 | 26.32 | 7.12 | 31.60 | 60.32 | <3.0 | 14.76 | <3.0 |
| Ammonium as N (mg NH4+-N/L) | **Mg $NH_4^+$-N/L** | < 0.2 | 1 | > 1 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.04 | 0.12 | <0.020 | 0.28 | 2.14 | <0.020 | 0.09 | 0.22 |
| Nitrate as N (mg $NO3^-$-N/L) | **mg $NO_3^-$-N/L** | < 3 | 10 | > 10 | 0.18 | 3.93 | 2.15 | 1.94 | 0.18 | 0.74 | 0.39 | 2.66 | 1.63 | 0.77 | 0.35 | 0.51 | 1.64 | 0.11 | 0.20 | 11.03 | 0.12 | 0.09 | 0.09 | 2.89 | 26.96 |
| Total Kjeldahl as N (mg N/L) * | **mg N/L** | < 0.5 | 1.5 | > 1.5 | 2.324 | 4.816 | 4.340 | 4.340 | 1.232 | 1.848 | 1.960 | 1.344 | 0.952 | 3.080 | 1.036 | 42.840 | 15.848 | 3.780 | 2.100 | 3.948 | 8.680 | 10.444 | 1.288 | 4.116 | 1.456 |
| Total Nitrogen as N (mg N/L) ** | **mg N/L** | < 3.5 | 11.5 | > 11.5 | 2.692 | 8.743 | 6.516 | 6.317 | 1.514 | 2.708 | 2.425 | 4.089 | 2.682 | 3.876 | 1.435 | 43.523 | 17.661 | 3.980 | 2.314 | 15.443 | 9.064 | 10.892 | 1.525 | 7.095 | 28.460 |
| Orthophosphate Phosphorus (mg o-PO4-P/L) | **mg o-$PO_4$-P/L** | < 0.05 | 0.16 | > 0.16 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | <0.020 | 0.0385 | <0.020 | 7.31 | 1.05 | <0.020 | <0.020 | 0.89 | 0.13 | <0.020 | <0.020 | 0.33 | <0.020 |
| Total Phosphorus (mg P/L) | **mg/L** | < 0.08 | 0.2 | > 0.2 | <0.06 | <0.06 | 0.07157 | 0.06084 | <0.06 | 0.10 | <0.06 | 0.41 | <0.06 | 0.07235 | <0.06 | 16.14 | 2.37 | 0.21 | 0.12 | 1.77 | 0.37 | 0.48 | <0.06 | 1.22 | <0.06 |
| Fluoride ($F^-$) | **mg/L** | <1 | 1 | >1.5 | 0.147 | 0.157 | 0.127 | 0.186 | <0.020 | <0.020 | 0.064 | <0.020 | 0.46 | 0.165 | 0.17 | 5.97 | <0.020 | <0.020 | 0.05 | 0.33 | 3.55 | 4.70 | 0.11 | 0.17 | 0.03 |
| Manganese (Mn) | **µg/L** | <100 | 500 | >500 | <10.0 | 24.75 | 94.55 | 42.03 | 45.63 | 39.10 | 36.25 | 16.41 | 370.40 | 35.63 | 32.11 | 1093.0 | 813.70 | 81.26 | 805.40 | 20.20 | 326.20 | 250.30 | 11.48 | 127.80 | <10.0 |
| Selenium (Se) | **µg/L** | <10 | 15 | >15 | 16.18 | 12.86 | 12.87 | <5.0 | <5.0 | 6.86 | 12.74 | 6.19 | 14.81 | 10.85 | 7.18 | 13.47 | 11.15 | 14.13 | 10.47 | 11.48 | 10.31 | <5.0 | 18.76 | 6.74 | 94.47 |
| Sulphur | **µg/L** | <2 | 5 | >5 | 25.00 | 7.00 | 17.00 | 3.00 | 8.00 | 10.00 | <2.00 | <2.00 | 31.00 | 27.00 | 22.00 | <2.00 | 32.00 | 85.00 | 17.00 | <2.00 | 753.00 | 492.00 | 2.00 | <2.00 | 6.00 |
| **Water Quality Class** | | | | | III | III | III | III | III | III | III | III | III | III | III | III | III | III | III | III | III | III | III | III | III |

* TKN: NH3-N + Organic Nitrogen

**TN: TKN + NO3-N + NO2-N

**Table 53: Assessment of Surface Water Samples According to Surface Water Quality Regulation in terms of Specific Pollutants and Priority Substances (Annex-5 Table-4)**

| Parameter | Units | Max-Environmental Quality Standards for Rivers/Lakes | | Project Standards | Sampling Points | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Yearly Average | Maximum | | SW-1 | SW-3 | SW-4 | SW-5 | SW-6 | SW-7 | SW-8 | SW-9 | SW-11 | SW-12 | SW-13 | SW-15 | SW-19 | SW-20 | SW-21 | SW-24 | SW-25 | SW-26 | SW-28 | SW-29 | SW-30 |
| Aluminum (Al), Total | µg/L | 2.2 | 27 | 27 | 144.8 | 216.4 | 206.1 | 161.7 | 207.2 | 124.8 | 106.8 | 149.5 | 366.1 | 229.8 | 306.5 | 3005.0 | 2831.0 | 981.6 | 845.7 | 426.8 | 461.8 | 1012.0 | 72.2 | 299.8 | 111.4 |
| Antimony (Sb), Total | µg/L | 7.8 | 103 | 103 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 14.76 | 15.21 | <5.0 | <5.0 | <5.0 |
| Arsenic (As), Total | µg/L | 53 | 53 | 53 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Barium (Ba), Total | µg/L | 680 | 680 | 680 | 44.76 | 59.73 | 57.39 | 55.42 | 53.17 | 38.89 | 41.49 | 78.61 | 70.53 | 162.9 | 27.77 | 264.3 | 155.8 | <10.0 | 94.5 | 118.8 | 95.53 | 128.7 | 93.2 | 67.4 | 24.82 |
| Benzene | µg/L | 10 | 50 | 50 | <0.2 | | | | <0.2 | | <0.2 | | <0.2 | | | | | | <0.2 | | | | | <0.2 | |
| Benzo(a)pyrene | µg/L | 0.00017 | 0.27 | 0.27 | <0.01 | | | | <0.01 | | <0.01 | | <0.01 | | | | | | <0.01 | | | | | <0.01 | |
| Beryllium (Be), Total | µg/L | 2.5 | 3.9 | 3.9 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Boron (B), Total | µg/L | 707 | 1472 | 1472 | <0.01 | <0.01 | 0.1628 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | 69.56 | 0.1985 | 0.1392 | <0.01 | <0.01 | <0.01 |
| Cadmium (Cd), Total | µg/L | <0.08 (Class 1) | <0.45 (Class 1) | 1.5 (Class 5) | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| | | 0.08 (Class 2) | 0.45 (Class 2) | | | | | | | | | | | | | | | | | | | | | | |
| | | 0.09 (Class 3) | 0.6 (Class 3) | | | | | | | | | | | | | | | | | | | | | | |
| | | 0.15 (Class 4) | 0.9 (Class 4) | | | | | | | | | | | | | | | | | | | | | | |
| | | 0.25 (Class 5) | 1.5 (Class 5) | | | | | | | | | | | | | | | | | | | | | | |
| Chromium (Cr), Total | µg/L | 1.6 | 142 | 142 | <5.0 | <5.0 | 12.98 | <5.0 | <5.0 | <5.0 | 7.134 | <5.0 | <5.0 | <5.0 | 7.402 | 11.69 | 13.79 | <5.0 | <5.0 | <5.0 | 9.443 | 17.87 | 8.785 | 5.823 | <5.0 |
| Cobalt (Co), Total | µg/L | 0.3 | 2.6 | 2.6 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | 7.323 | 9.18 | <5.0 | 5.912 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Copper (Cu), Total | mg/L | 0.0016 | 0.0031 | 0.0031 | <0.001 | <0.001 | <0.001 | <0.001 | 0.015 | <0.001 | <0.001 | <0.001 | <0.001 | 0.010 | 0.015 | 0.034 | 0.027 | 0.006 | 0.008 | 0.022 | 0.016 | 0.034 | <0.001 | 0.010 | <0.001 |
| Iron (Fe), Total | µg/L | 36 | 101 | 101 | 49.21 | 154 | 765.4 | 157.8 | 1321 | 146.4 | 86.53 | 95.24 | 513.6 | 98.09 | 1453 | 1956 | 2713 | 703.5 | 1095 | 123.4 | 425.8 | 576.1 | 40.43 | 356.8 | 35.29 |
| Lead (Pb), Total | µg/L | 1.2 | 14 | 14 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | 17.49 | <10.0 | <10.0 | 18.64 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Mercury (Hg), Total | µg/L | | 0.07 | 0.07 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Nickel (Ni), Total | µg/L | 4 | 34 | 34 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| PAH Benzo(b)fluoranthene | µg/L | | 0.017 | 0.017 | <0.01 | | | | <0.01 | | <0.01 | | <0.01 | | | | | | <0.01 | | | | | <0.01 | |
| Silicon (Si), Total | mg/L | 1.83 | 1.83 | 1.83 | | | | | | | | | | | | | | | | | | | | | |
| Silver (Ag), Total | µg/L | 1.5 | 1.5 | 1.5 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Tin (Sn), Total | mg/L | 0.013 | 0.013 | 0.013 | | | | | | | | | | | | | | | | | | | | | |
| Titanium (Ti), Total | mg/L | 0.026 | 0.042 | 0.042 | | | | | | | | | | | | | | | | | | | | | |
| Total Suspended Solids | mg/L | 50 | 50 | 50 | | | | | | | | | | | | | | | | | | | | | |
| Vanadium (V), Total | mg/L | 1.6 | 97 | 97 | 276.7 | 180.7 | 162.1 | 175.8 | 149.1 | 160.3 | 124.9 | 185.9 | 146.5 | 166.4 | 144.1 | 139.3 | 46.38 | 99.49 | 18.48 | 146.7 | 57.33 | 61.76 | 57.82 | 88.1 | <10.0 |
| Zinc (Zn), Total | mg/L | 5.9 | 231 | 231 | 257.7 | 129.8 | 283.9 | 208.2 | 181.4 | 203.6 | 210.6 | 109.2 | 144.9 | 247.8 | 170.1 | 438.9 | 291.1 | 152.5 | 294.3 | 186 | 114.4 | 210.9 | 131 | 171.5 | 167.6 |
| 1,2-dichloroethane | µg/L | 10 | | 10 | <0.2 | | | | <0.2 | | <0.2 | | <0.2 | | | | | | <0.2 | | | | | <0.2 | |

Note: Since the Reporting Limits for Cobalt, Mercury and Silver are above the maximum limits specified in Annex-5 and Table-4 and Table-5 of the SWQR, no assessment was made for these parameters on whose concentrations were measured below the Reporting Limits.

### *Drinking Water Quality Regulations*

In addition to protecting groundwater from deterioration, the drinking water legislation has taken into consideration for surface water locations which are used for human consumption (SW-1, SW-6, SW-8, SW-11, SW-21 and SW-29). The drinking water standards for the Project were set by taking into consideration the legislation listed below.

- "Regulation of Water Intended for Human Consumption" (RWIHC), Official Gazette No: 25730, Dated: 17.02.2005 (Amended: OG-14/03/2023-31068),
- "European Union Directive on the Quality of Water Intended for Human Consumption", No. 2020/2184, Dated: 16/12/2020,
- "Drinking Water Quality Guidelines" developed by the World Health Organization, Dated: 21/03/2022.

The physical, chemical, and radiological parameters taken into consideration in the Project standards and the comparison of limit values with measured concentrations are presented in Table 54. In addition to the chemical, physical and radiological parameters of the drinking water, the microbiological parameters also have legislative limits as per RWIHC and the Council Directive 2020/2184. For comparison, minimum values of the standards were used in order to be on the safe side.

The analysis results revealed that at all monitoring points where microbiological sampling was performed, at least one microbiological pollutant was detected. Specifically, Colony count at 22 °C, Colony count at 37 °C

E.coli, Enterococcus, P. Aeruginosa, Pathogenic Staphylococcus, Sulphite-reducing bacteria with anaerobic spores and Coliform Bacteria were detected at all six (6) monitoring points (SW-1, SW-6, SW-8, SW-11, SW-21, and SW-29). Moreover, total concentrations of Iron exceeded the regulations at all locations. While the minimum limit values for aluminium and manganese were exceeded at all locations except SW-1 and SW-8, the minimum limit values were exceeded at all locations except SW-6 and SW-29 for selenium. The indicative dose of beta activity was also above 0.1 mSv/year at all locations except SW-11, where alpha radioactivity is above the regulation. Manganese, oxidizability, sulphate and nitrite were other exceeding parameters, of which minimum limit values were also exceeded at three (SW-11, SW-21 and SW-29), three (SW-6, SW-8 and SW-11), one (SW-1) and one (SW-1) monitoring locations, respectively.

**Table 54: Assessment of Surface Water Samples According to Drinking Water Standards**

| Parameter | Units | Standards | | | | Samples | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Turkish Standards | EU Standards | WHO Standards | Minimum of the Standards | SW-1 | SW-6 | SW-8 | SW-11 | SW-21 | SW-29 |
| **Chemical Parameters** | | | | | | | | | | | |
| 1,2-Dichloroethane | mg/l | 3 | 3 | 30 | 3 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Acrylamide | µg/l | 0.1 | 0.1 | 0.5 | 0.1 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 | <0.025 |
| Antimony | µg/l | 5 | 10 | 20 | 5 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Arsenic | µg/l | 10 | 10 | 10 | 10 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Barium | µg/l | - | - | 700 | 700 | 44.8 | 53.2 | 41.5 | 70.5 | 94.5 | 67.4 |
| Benzene | µg/l | 1 | 1 | 10 | 1 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Benzo(a)pyrene | µg/l | 0.01 | 0.01 | 0.07 | 0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Boron | mg/l | 1 | 1.5 | 2.4 | 1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Bromate | µg/l | 10 | 10 | 10 | 10 | <10 | <10 | <10 | <10 | <10 | <10 |
| Cadmium | mg/l | 0.005 | 0.005 | 0.003 | 0.003 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Chromium | µg/l | 50 | 25 | 50 | 25 | <5.0 | <5.0 | 7.134 | <5.0 | <5.0 | 5.823 |
| Copper | mg/l | 2 | 2 | 2 | 2 | <0.001 | 0.015 | <0.001 | <0.001 | 0.008 | 0.010 |
| Cyanide | µg/l | 50 | 50 | 70 | 50 | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 | <10.00 |
| Epichlorohydrin | µg/l | 0.1 | 0.1 | 0.4 | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Fluoride | mg/l | 1.5 | 1.5 | 1.5 | 1.5 | 0.147 | <0.020 | 0.064 | 0.464 | 0.050 | 0.165 |
| Lead | µg/l | 10 | 5 | 10 | 5 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 | <10.0 |
| Mercury | µg/l | 1 | 1 | 6 | 1 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| Nickel | µg/l | 20 | 20 | 70 | 20 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 | <5.0 |
| Nitrate (as $NO_3^-$) | mg/l | 50 | 50 | 50 | 50 | 0.81 | 0.80 | 1.73 | 7.22 | 0.90 | 12.81 |
| Nitrite (as $NO_2^-$) | mg/l | 0.5 | 0.5 | 3 | 0.5 | 0.612 | 0.334 | 0.246 | 0.325 | <0.066 | 0.277 |
| Polycyclic aromatic hydrocarbons | µg/l | 0.1 | 0.1 | - | 0.1 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 | <0.01 |
| Selenium | µg/l | 10 | 20 | 40 | 10 | 16.18 | <5.0 | 12.74 | 14.81 | 10.47 | 6.744 |
| Trichloroethylene | mg/l | 0.01 | 0.01 | 0.02 | 0.01 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Trihalomethanes Total | µg/l | 100 | 100 | - | 100 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Vinyl Chloride | mg/l | 0.0005 | 0.0005 | 0.0003 | 0.0003 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Indicator Parameters** | | | | | | | | | | | |
| Aluminum | µg/l | 200 | 200 | - | 200 | 144.8 | 207.2 | 106.8 | 366.1 | 845.7 | 299.8 |
| Ammonium | mg/l | 0.5 | 0.5 | - | 0.5 | <0.026 | <0.026 | <0.026 | <0.026 | 0.157 | 0.116 |
| Chloride | mg/l | 250 | 250 | - | 250 | 54.90 | 21.93 | 10.84 | 48.69 | 22.90 | 128.56 |
| Colour | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | - | Acceptable to consumers and no abnormal change | Acceptable | Acceptable | Acceptable | Acceptable | Acceptable | Acceptable |
| Electrical Conductivity at 20°C ($EC_{20}$) | µS/cm | 2500 | 2500 | - | 2500 | 1527.0 | 867.0 | 632.0 | 1068.0 | 213.0 | 1168.0 |
| pH | | 6.5 - 9.5 | 6.5 - 9.5 | | | 8.08 | 8.55 | 8.65 | 8.52 | 9.23 | 8.28 |
| Iron | mg/l | 0.2 | 0.2 | | 0.2 | 49.21 | 1321 | 86.53 | 513.6 | 1095 | 356.8 |
| Manganese | µg/l | 50 | 50 | 40 | 40 | <10.0 | 45.63 | 36.25 | 370.4 | 805.4 | 127.8 |
| Odor | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | | Acceptable to consumers and no abnormal change | Acceptable | Acceptable | Acceptable | Acceptable | Acceptable | Acceptable |
| Oxidisability | mg/l $O_2$ | 5 | 5 | | 5 | <2.80 | 2.94 | 3.85 | 3.59 | 12.85 | 11.21 |
| Sulphate | mg/l | 250 | 250 | | 250 | 590.63 | 134.53 | 99.04 | 89.17 | 45.20 | 103.66 |

| Parameter | Units | Standards | | | | Samples | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Turkish Standards | EU Standards | WHO Standards | Minimum of the Standards | SW-1 | SW-6 | SW-8 | SW-11 | SW-21 | SW-29 |
| Sodium (Total) | mg/l | 200 | 200 | | 200 | 117.8 | 75.1 | 58.38 | 105.9 | 14.77 | 116.2 |
| Taste | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | | Acceptable to consumers and no abnormal change | Acceptable | Acceptable | Acceptable | Acceptable | Acceptable | Acceptable |
| Total organic carbon (TOC) | mg/l | No abnormal change | No abnormal change | | No abnormal change | 2.89 | 3.31 | 5.66 | 3.96 | 12.16 | 13.78 |
| Turbidity | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | | Acceptable to consumers and no abnormal change | 2.22 | 2.72 | 2.40 | 4.91 | 140.00 | 18.80 |
| **Pesticides** | | | | | | | | | | | |
| 2,4 Acid* | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| 2,4,5-T* | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Aclonifen* | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Atrazine | µg/l | 0.1 | 0.1 | 2 | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Bentazone* | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Bifenox* | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Boscalid | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Bromoxynl* | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Carbaryl | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Carbendazim* | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Carbofuran | µg/l | 0.1 | 0.1 | 7 | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Chlorfenvinphos | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Clothianidin | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Cybutryn | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Dichlorvos | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Dimethoate | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Diuron | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Ethoprophos | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| ETU | µg/l | 0.1 | 0.1 | - | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Fenarimol | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Fenthion | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Hexythiazox | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Imazalil | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Imidachloprid | µg/l | 0.1 | 0.1 | - | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Isoproturon | µg/l | 0.1 | 0.1 | 9 | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Linuron | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Malathion | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| MCA* | µg/l | 0.1 | 0.1 | | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Metalaxyl | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Methidathion | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Methomyl | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Methoxyfenozide | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Metolachlor | µg/l | 0.1 | 0.1 | 10 | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Molinate | µg/l | 0.1 | 0.1 | 6 | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Monocrotophos | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Myclobutanil | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |

| Parameter | Units | Standards | | | | Samples | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Turkish Standards | EU Standards | WHO Standards | Minimum of the Standards | SW-1 | SW-6 | SW-8 | SW-11 | SW-21 | SW-29 |
| Omethoate | µg/l | 0.1 | 0.1 | | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Oxadiazon | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Oxadixil | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Pendimethalin | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Piperonyl butoxide | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Propazine | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Propiconazole | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Propyzamide | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Quinoxyfen | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Simazine | µg/l | 0.1 | 0.1 | 2 | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Terbutryn | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Thiophonate Methyl* | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Triadimenol | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Tribenuron-methyl* | µg/l | 0.1 | 0.1 | | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Triclosan* | µg/l | 0.1 | 0.1 | | 0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| Tritosulfuron | µg/l | 0.1 | 0.1 | | 0.1 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 | <0.05 |
| Pesticides Total | µg/l | 0.5 | 0.5 | - | 0.5 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 | <0.1 |
| **Microbiologic Parameters** | | | | | | | | | | | |
| Colony count at 22 °C | number/mL | 20 | - | - | 20 | 125 | 190 | 68 | 270 | 510 | > 3000 |
| Colony count at 37 °C | number/mL | 5 | - | - | 5 | 116 | 59 | 41 | 109 | > 300 | > 300 |
| E.coli | number/100mL | 0 | 0 | - | 0 | 62 | 50 | 60 | 68 | 0 | 870 |
| Enterococcus | number/100mL | 0 | 0 | - | 0 | 62 | 38 | 8 | 96 | 115 | 300 |
| P. Aeruginosa | number/100mL | 0 | - | - | 0 | 30 | 61 | 53 | 98 | 130 | 30 |
| Parasites | number/5 L | 0 | - | - | 0 | 30 | 0 | 0 | 4 | 2230 | 10 |
| Pathogenic Staphylococcus | number/100mL | 0 | - | - | 0 | 300 | 41 | 29 | 38 | 135 | 400 |
| Sulfite-reducing bacteria with anaerobic spores | number/50mL | 0 | - | - | 0 | 26 | 28 | 23 | 24 | 93 | 98 |
| Coliform Bacteria (Total-Fecal) | number/100mL | 0 | 0 | - | 0 | 102 | 250 | 310 | 368 | 96 | 1820 |
| C. perfringens (including spores) | number/100ml | 0 | 0 | - | 0 | 0 | 21 | 12 | 0 | 0 | 0 |
| **Radioactivity Parameters** | | | | | | | | | | | |
| Tritium | Bq/L | 100 | - | 10000 | 100 | <10 | <10 | <10 | <10 | <10 | <10 |
| Total Indicative Dose – alpha activity | mSv/year | 0.1 | - | - | 0.1 | 0.06 | <0.04 | 0.06 | 0.11 | <0.04 | 0.07 |

| Parameter | Units | Standards | | | | Samples | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Turkish Standards | EU Standards | WHO Standards | Minimum of the Standards | SW-1 | SW-6 | SW-8 | SW-11 | SW-21 | SW-29 |
| Total Indicative Dose – beta activity | mSv/year | 0.1 | - | - | 0.1 | 0.19 | 0.17 | 0.10 | <0.10 | 0.32 | 0.29 |

### *Irrigation Water Quality Regulations*

Both surface water and groundwater in the vicinity of the Project Area have the potential to be used as irrigation water by the surrounding villages since areas with surface water were classified as “non-irrigated arable land” mainly according to CORINE 2018. Therefore, water quality for use as irrigation water was also evaluated for the samples. Soil salinity, as measured by the sodium adsorption ratio (SAR), can have negative impacts on soil permeability and infiltration. When sodium ions are present in soil in exchangeable form, they can replace calcium and magnesium ions that are adsorbed on soil clays. This replacement can cause soil particles to become dispersed, leading to the breakdown of soil aggregates. As a result, the soil may become hard and compact when dry, reducing the infiltration rates of water and air into the soil and negatively affecting its structure. The SAR is a useful metric for quantifying the impact of high sodium ion levels on soil, and is calculated as follows:

The salinity diagram developed by the US Salinity Laboratory[43] is widely used for classification of the irrigation waters. According to this diagram, the irrigation waters are classified according to the Sodium Absorption Ratio (SAR) and the electrical conductivity values thereof as presented in Table 55.

Based on the surface water samples, the water sampled from SW-21 is categorized as C1S1 (low-saline, low-sodium), while SW-08, SW-13, SW-19, SW-20 and SW-30 are classified as C2S1 (medium-saline, low-sodium). SW-1, SW-3, SW-4, SW-5, SW-6, SW-7, SW-9, SW-11, SW-12, SW-15 and SW-29 can be classified as C3-S1 (high-saline, low-sodium), whereas samples collected from SW-24, SW-25 and SW-26 are C3-S2 (high-saline, medium-sodium) waters (Figure 56).

**Table 55: Irrigation Water Classification**

| Salinity Hazard Class | EC µS/cm | Irrigation Water Class | Sodium Hazard Class | SAR | Irrigation Water Class |
|---|---|---|---|---|---|
| **C1** | 100-250 | Low Salinity | **S1** | <10 | Low Sodium |
| **C2** | 250-750 | Medium Salinity | **S2** | 10-18 | Medium Sodium |
| **C3** | 750-2250 | High Salinity | **S3** | 18-26 | High Sodium |
| **C4** | >2250 | Very High Salinity | **S4** | >26 | Very High Sodium |

[43] Richards, L. A. (1954). Diagnosis and Improvement of Saline and Alkali Soils. Washington D.C.: US Department of Agriculture.

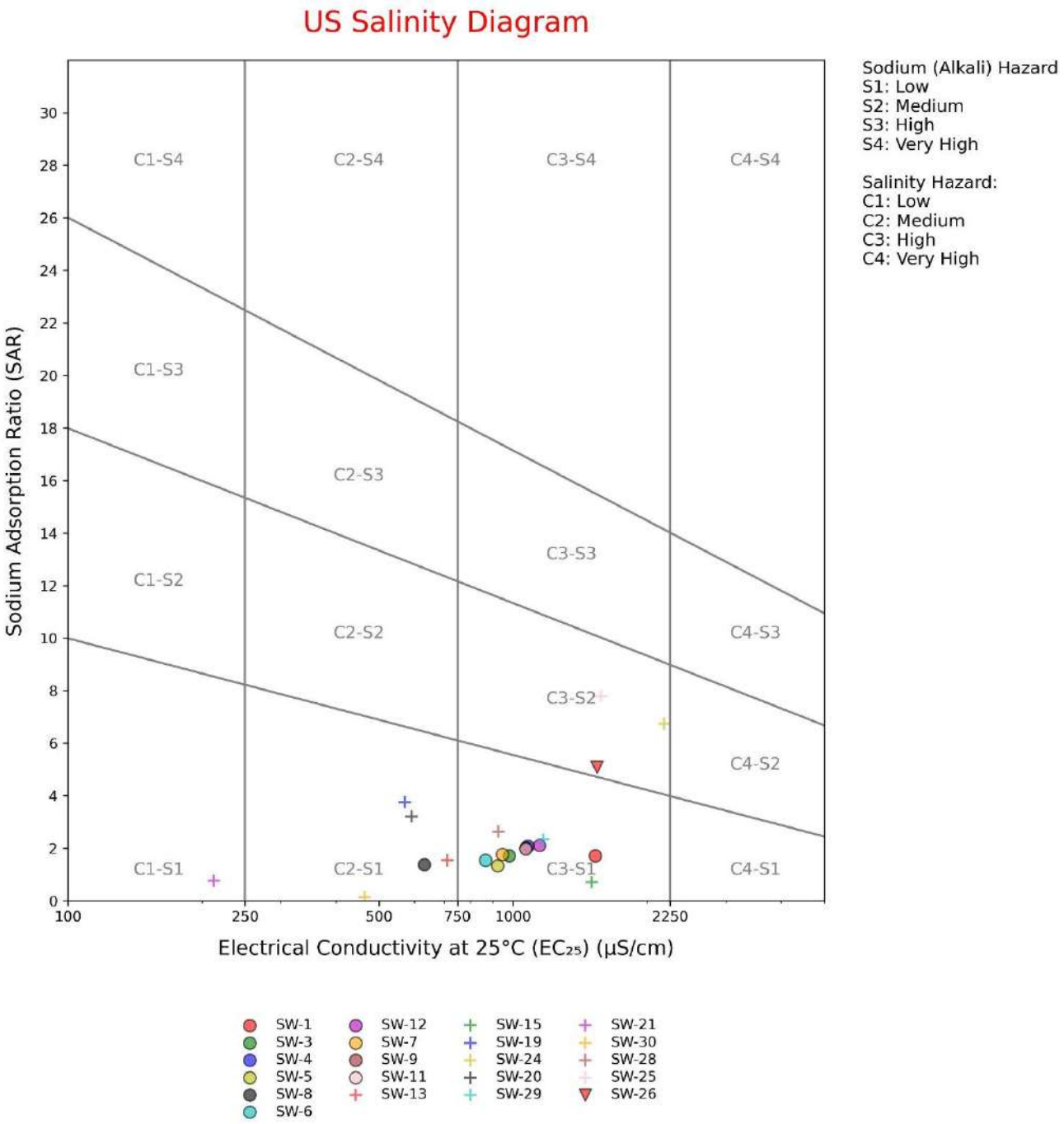



**Figure 56: US Salinity Diagram for Surface Water Samples**

#### 6.1.6.5 Flood Risks

According to the national EIA, there are six (6) flood control structures in operation on the route, namely; "Marmaraereğlisi Kınıklı Stream; Karaevli Village Lands Seymen Stream; Gazioğlu-Husunlu-Köseilyas Village Lands Gazioğlu Stream; Köseilyas-Kayı-Kılavuzlu Villages Kayı Stream; İnecik-Yukarıkılıçlı-Oruçbeyli- Karaçalı and Sametli Villages; Malkara Çimendere Village and Lands Kocaderesi". The project route passes through the water basins of Türkmenli and Bıyıkali ponds that are used for drinking water and irrigation purposes.

Within the scope of the Project, river crossings such as overpasses, underpasses and culverts will be constructed. A Flood Risk Assessment Report will be prepared for the Project in order to ensure the design characteristics of the crossing structure are acceptable. All the river crossings will be studied based on the Q10, Q25, Q50, Q100 and Q500 projections. The report will give information related to each crossing in terms of expected flow rate, structure type and dimensions.

### 6.1.7 Hydrogeology and Groundwater Quality

Hydrogeological Characterizations and Baseline Groundwater Quality Assessments were carried out according to the Primary and Secondary Data sources. A water quality survey was carried out in the Project Area and its vicinity to obtain the **Primary Data.**

The quality of the groundwater is determined by considering whether the measured values of the specified parameters exceed the water quality regulatory standards, objectives, and guidelines. The Project Standards and applicable environmental limits are provided in Appendix A.

The reports which were used as **Secondary Data** sources are listed below:

- Kınalı-Tekirdağ-Çanakkale-Savaştepe 1st and 2nd Section Highway Final EIA Report, Ak-Tel, Nov. 2016,
- Meriç-Ergene and Marmara Basins Drought Management Plan Project, Marmara Basin Drought Management Plan Strategic Environmental Assessment Scoping Report, General Directorate of Water Management (GDWM), May 2022,
- Meriç-Ergene and Marmara Basins Drought Management Plan Project, Meriç-Ergene Basin Drought Management Plan Strategic Environmental Assessment Scoping Report, General Directorate of Water Management (GDWM), May 2022,
- Anatolian Part of the Marmara Basin Master Plan Report, General Directorate of State Hydraulic Works (SHW), 2014,
- Thracian Part of the Marmara Basin Master Plan Report, General Directorate of State Hydraulic Works (SHW), 2018,
- Meriç-Ergene Basins Master Plan Report, General Directorate of State Hydraulic Works (SHW), 2018,
- The International Hydrogeological Map of Europe (Scale: 1/1,500,000) (IHME1500).

The Regional and Local Hydrogeology and the Baseline Groundwater Quality of the Project Site are discussed herein.

#### 6.1.7.1 Regional Context

For not only surface water but also groundwater resources management, Türkiye has been divided into 25 basins, considering geographical components including geographical location, climate and stream network. The Project components are within both the Meriç-Ergene (Evros) River Basin and the Marmara Basin, among these basins. According to the “Official Water Resources Statistics” published by State Hydraulic Works (SHW) in 2019, 507.7 and 241.7 $hm^3$/year of Türkiye’s total 23,032.3 $hm^3$/year groundwater recharge comes from the

Meriç-Ergene and Marmara Basins, respectively. Furthermore, 498,2 and 210.7 $hm^3$/year of Türkiye's 17,815.3 $hm^3$/year groundwater operating reserve comes from the Meriç-Ergene and Marmara Basins, respectively (Table 56).

**Table 56: Basic Information on Groundwater Basins of Türkiye**

| Basin No. | Basin | Groundwater Recharge ($hm^3$/year) | Groundwater Operating Reservoir ($hm^3$/year) |
|---|---|---|---|
| 1 | Meriç-Ergene | 507.7 | 498.2 |
| 2 | Marmara | 241.7 | 210.7 |
| 3 | Susurluk | 780.4 | 585.9 |
| 4 | Northern Aegean | 289.4 | 212.9 |
| 5 | Gediz | 1155.9 | 866.9 |
| 6 | Küçük Menderes | 179.2 | 179.2 |
| 7 | Büyük Menderes | 1045.4 | 761.5 |
| 8 | Western Mediterranean | 473.2 | 316.7 |
| 9 | Antalya | 1164.7 | 576.3 |
| 10 | Burdur | 106.4 | 89.5 |
| 11 | Akarçay | 345.4 | 345.4 |
| 12 | Sakarya | 2197.1 | 1545.2 |
| 13 | Western Black Sea | 641.2 | 607.6 |
| 14 | Yeşilırmak | 907.2 | 872.8 |
| 15 | Kızılırmak | 2003.1 | 1762.9 |
| 16 | Konya | 2597 | 2023 |
| 17 | Eastern Mediterranean | 96.5 | 70.5 |
| 18 | Seyhan | 838.8 | 749.9 |
| 19 | Asi | 393.2 | 289.5 |
| 20 | Ceyhan | 985.3 | 533.5 |
| 21 | Fırat-Dicle | 4994.8 | 3763.7 |
| 22 | Eastern Black Sea | 490.9 | 490.9 |
| 23 | Çoruh | 30 | 20 |
| 24 | Aras | 388.5 | 294.4 |
| 25 | Lake Van | 179.2 | 148.2 |

## *Meriç-Ergene (Evros) Basin*

According to the Hydrogeology section of the Thracian Part of the Marmara Basin, Master Plan Report conducted by State Hydraulic Works in 2018, the Meriç-Ergene Basin was found to have a groundwater potential of 573 $hm^3$, which was then divided into sub-basins for further study. Analysis of well flow rates in the Ergene sub-basin allowed for the calculation of the total groundwater discharge for various purposes such as drinking, industrial, and agricultural, amounting to 314.5 x $10^6$ $m^3$/year. In the Meriç sub-basin, allocation for drinking and general usage was determined to be 20.95 $hm^3$/year, 11.72 $hm^3$/year for industrial water usage, 64.04 $hm^3$/year

for irrigation, and a total allocation of 96.71 $hm^3$/year. Meanwhile, the total groundwater discharge in the Black Sea sub-basin, evaluated for industry, irrigation, and usage purposes, was found to be 9.91 $hm^3$/year.

### *The Marmara Basin*

24 sub-basins were defined in the Marmara Basin within the scope of the Master Plan Studies in 2014, 17 of which are in the İznik-İstanbul Region and 7 in the Çanakkale Region.

According to the Anatolian Part of the Marmara Basin Master Plan Report[44] (DSİ, 2014), infiltration areas of the aquifers and accordingly groundwater recharges have decreased, as the alluvial plains in the Ağva and Kartal sub-basins in the Marmara Basin have been opened for intensive development. Since there was not enough information, especially for the Ağva sub-basin aquifers and the alluvial plains had been opened for development, a groundwater budget has not been prepared for this sub-basin in this study. The groundwater budgets calculated for the Marmara Basin sub-basins are given in the table below (Table 57). As the aquifers in the Marmara Basin are generally composed of alluvial aquifers deposited along the coast of the Marmara Sea, saltwater intrusion is also observed in groundwater over usage.

For the Thracian Part of the Marmara Basin, Master Plan studies were conducted in 2018[45] (DSİ, 2018). For calculations, Thracian Part was divided according to DSİ Regional Directorate borders. It was calculated that recharges were 8.72 $hm^3$/year for Balıkesir, 50.2 $hm^3$/year for Edirne, and 173.35 $hm^3$/year for Istanbul Regional Directorate areas. Also, groundwater discharge was calculated as 3.79, 37.75 and 120.36 $hm^3$/year for Balıkesir, Edirne and Istanbul Regional Directorate areas, respectively.

[44] State Hydraulic Works (SHW). (2014). Anatolian Part of the Marmara Basin Master Plan Report. Ankara: DSİ (SHW).

[45] State Hydraulic Works (SHW). (2018). Thracian Part of the Marmara Basin, Master Plan Report. Ankara: DSİ (SHW).

**Table 57: Groundwater Budget of the Marmara Basin According to the Master Plans**

| Surface Water Sub-basin | | Area of the SW Sub-Basin ($km^2$) | Groundwater Basin | Area of the GW Basin ($km^2$) | Aquifer Type and Name | $hm^3$/year | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GW Recharge | GW Reserve | GW Allocation | Diff. |
| Anatolian Part | Ağva | 2969.65 | Kandıra | 612.58 | No Aquifer Units. | | | | |
| | | | Şile | 1419.56 | | | | | |
| | | | Ömerli | 937.51 | | | | | |
| | Körfez | 3365.79 | Beykoz | 278.73 | | | | | |
| | | | Kartal-Gebze | 239.46 | Tuzla Plain Alluvium | 1.50 | 1.00 | 1.00 | 0.00 |
| | | | | | Çayırova Alluvium | 3.00 | 2.50 | 2.50 | 0.00 |
| | | | Hereke | 251.96 | Dilovası Alluvium | 2.50 | 2.00 | 2.00 | 0.00 |
| | | | | | Mesosoic limestones | 7.50 | 7.50 | 7.50 | 0.00 |
| | | | Kocaeli | 160.45 | Yarımca-Tütünçiftlik-Derince Plains' alluvium | 2.50 | 2.50 | 2.50 | 0.00 |
| | | | Körfez | 650.72 | İzmit alluvium | 20.50 | 20.50 | 20.50 | 0.00 |
| | | | Gölcük | 234.74 | Gölcük alluvium | 3.90 | 3.90 | 3.90 | 0.00 |
| | | | Karamürsel | 387.36 | Karamürsel alluvium | 2.00 | 2.00 | 2.00 | 0.00 |
| | | | | | Hersek alluvium | 4.63 | 4.63 | 4.63 | 0.00 |
| | | | Yalova | 432.88 | Taşköprü alluvium | 2.97 | 2.97 | 2.97 | 0.00 |
| | | | | | Yalova alluvium | 4.90 | 4.90 | 4.90 | 0.00 |
| | | | Armutlu | 413.84 | | | | | |
| | | | Gemlik | 315.65 | Gemlik deltoid alluvium | 5.80 | 5.80 | 5.80 | 0.00 |
| | | | | | Engürücük alluvium + Neogene sedimantery units | 5.70 | 5.70 | 5.70 | 0.00 |
| | | | Mudanya | 86.69 | Mudanya Neogene sedimantery units | 4.00 | 4.00 | 4.00 | 0.00 |
| | İznik Lake | 1240.01 | Orhangazi | 157.01 | Alluvium | 19.50 | 19.50 | 19.50 | 0.00 |
| | | | | | Marble | 17.00 | 9.00 | 9.00 | 0.00 |

| Surface Water Sub-basin | | Area of the SW Sub-Basin ($km^2$) | Groundwater Basin | Area of the GW Basin ($km^2$) | Aquifer Type and Name | $hm^3$/year | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | GW Recharge | GW Reserve | GW Allocation | Diff. |
| | | | İznik | 553.83 | Alluvium | 12.50 | 12.50 | 14.00 | -1.50 |
| | | | | | Marble | 9.00 | 7.50 | 7.50 | 0.00 |
| | | | Bayırköy | 224.66 | Alluvium + Neogene sedimantery units | 3.50 | 2.00 | 1.50 | 0.50 |
| | | | İznik Lake | 304.51 | | | | | |
| | Gönen Stream | 2156.21 | Yenice-Kalkım-Pazarköy | 1095.16 | Pazarköy plain alluvium | 4.00 | 3.50 | 1.87 | 1.63 |
| | | | Gönen-Tahirova | 1061.05 | Alluvium + Neogene sedimantery units | 45.00 | 36.00 | 17.51 | 18.49 |
| | | | | | Tahirova alluvium + Neogene sedimantery units | 4.00 | 3.20 | 3.44 | -0.24 |
| | Biga Stream | 4150.96 | Çan | 908.77 | Çan Plain's alluvium | 16.00 | 12.50 | 14.57 | -2.07 |
| | | | Biga | 1848.29 | Biga Plain's alluvium + Neogene sedimantery units | 32.00 | 22.50 | 19.19 | 3.31 |
| | | | Lapseki-Çardak | 287.26 | Lapseki-Çardak Plain's alluvium + Neogene sedimantery units | 6.00 | 5.00 | 4.87 | 0.13 |
| | | | Umurbey | 471.13 | Umurbey Plain's alluvium + Neogene sedimantery units | 11.00 | 8.50 | 1.48 | 7.02 |
| | | | Çanakkale (Kirazlı) & Kepez | 635.51 | Çanakkale alluvium + Neogene sedimantery units | 7.40 | 6.00 | 2.40 | 3.60 |
| | | | | | Kepez alluvium + Neogene sedimantery units | 5.62 | 4.50 | 3.30 | 1.20 |
| Thracian Part | State Hydraulic Works. Balıkesir Region | 7544.12 | State Hydraulic Works. Balıkesir Region | 7544.12 | State Hydraulic Works. Balıkesir Region | 8.72 | Not calculated | 3.79 | 0.00 |
| | State Hydraulic Works. Edirne Region | 4602.38 | State Hydraulic Works. Balıkesir Region | 4602.38 | State Hydraulic Works. Balıkesir Region | 50.20 | Not calculated | 37.75 | 0.00 |
| | State Hydraulic Works. İstanbul Region | 5089.76 | State Hydraulic Works. Balıkesir Region | 5089.76 | State Hydraulic Works. Balıkesir Region | 173.35 | Not calculated | 120.36 | 0.00 |

### 6.1.7.2 Local Content

The hydrogeological AoI was determined considering the motorway route and associated facilities.

The most dominant hydrogeological units along the motorway are alluviums which are mainly composed of clay and sand. The gravel levels are sparse and thin, and the static water level is very shallow (between 0-5 meters). The thickness of the alluvium, which has a limited distribution along the riverbeds, varies between 10-20 m on average and rarely reaches 40 m.

In the basin, which generally consists of areas with low slopes of 0-5 degrees, meandering and low-energy streams have formed since the maximum elevation difference between sea level and the water section line in the north is 200 m. Dendritic drainage network is seen in impermeable - less permeable lithologies.

There are many caisson (keson in Turkish) wells in the Project Area, mostly in alluvium, at depths of 10-15 m and diameters up to 1-2 m. It is generally used with flow rates between 0.5-1 L/s, and it is operated for small-scale garden irrigation[46].

The hydro-stratigraphical map of the Project Area and its vicinity according to the International Map of Europe (Scale: 1/1,500,000) is given in Figure 57.

### 6.1.7.3 Baseline Groundwater Quality

Within the scope of the Project and its associated facilities, groundwater wells have not been drilled yet. For that reason, the well inventory obtained from the General Directorate of State Hydraulic Works (SHW) was evaluated to obtain information on wells in the vicinity of the Project for the Environmental Baseline Studies. Accordingly, a total of 12 groundwater wells were selected in the vicinity of the Project considering the proximity to the settlements which are likely to be affected and the upstream and downstream relationships of the associated facilities. However, the monitoring and sampling program was limited to three (3) wells due to several reasons. Four (4) of these wells could not be accessed because they were locked, located in private property or the well owner could not be contacted, while one (1) of them was inoperable because its electric transformer had been removed. In addition, there were no wells available for sampling at the suggested coordinates in the remaining four (4) locations (Table 58, Figure 57). For this reason, sampling/monitoring surveys were carried out only in three (3) of these groundwater wells to evaluate the baseline conditions. The information on the monitoring points and their locations are provided in Table 58. Laboratory analyses were conducted by TÜRKAK accredited ENCON Laboratory.

**Table 58: Basic Information on Groundwater Monitoring Locations**

| Monitoring Location | Coordinates (ED50 UTM Zone 35N) | | | Monitoring Status |
|---|---|---|---|---|
| | X | Y | Z (m. ASL) | |
| GW-1 | 523510.51 | 4530349.80 | 153.49 | Monitored |
| GW-2 | 525710.74 | 4531969.11 | 156.98 | Monitored |
| GW-3 | 531087.81 | 4536730.36 | 292.66 | Monitored |
| GW-4 | 549479.73 | 4540262.07 | 118.89 | Not Monitored<br>(The well owner could not be found.) |
| GW-5 | 545564.40 | 4540347.34 | 104.17 | Not Monitored |

[46] State Hydraulic Works (SHW). (2014). Anatolian Part of the Marmara Basin Master Plan Report. Ankara: DSİ (SHW).

| Monitoring Location | Coordinates (ED50 UTM Zone 35N) | | | Monitoring Status |
|---|---|---|---|---|
| | X | Y | Z (m. ASL) | |
| | | | | (The well could not be found.) |
| GW-6 | 536557.74 | 4541293.09 | 258.66 | Not Monitored<br>(The well owner could not be found.) |
| GW-7 | 553453.73 | 4541674.07 | 99.26 | Not Monitored<br>(The well owner could not be found.) |
| GW-8 | 553022.73 | 4542712.07 | 95.44 | Not Monitored<br>(The well was inoperable since its electric transformer had been removed.) |
| GW-9 | 560996.71 | 4545648.84 | 15.77 | Not Monitored<br>(The well owner could not be found.) |
| GW-10 | 585606.71 | 4548505.02 | 92.20 | Not Monitored (The well could not be found.) |
| GW-11 | 584942.90 | 4549093.83 | 63.00 | Not Monitored (The well could not be found.) |
| GW-12 | 588808.29 | 4552139.31 | 204.27 | Not Monitored (The well could not be found.) |

ASL: Above Sea Level

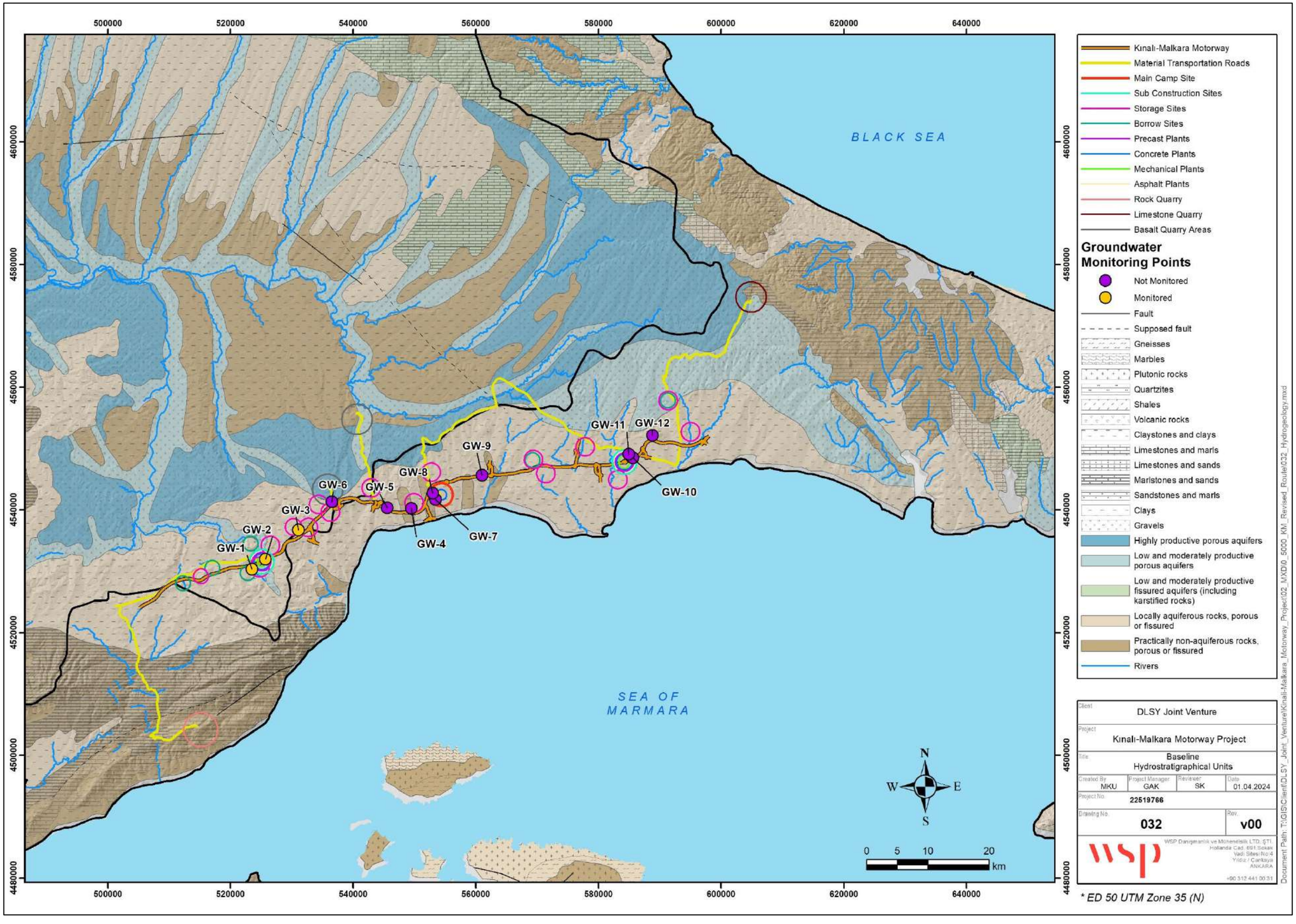



**Figure 57: Hydrostratigraphical Map of the Project Area and Groundwater Monitoring Points**

### *In-Situ Measurements*

Temperature, pH, Electrical Conductivity, Oxidation-Reduction Potential (ORP) and Dissolved Oxygen were measured (Table 59). According to these measurements, pH values ranged from 8.01 to 9.39. The lowest and highest temperatures were 6.4°C (at GW-1) and 13,9°C (at GW-3), respectively. The electrical conductivity (EC) values were 4400, 1647, and 720 µS/cm at GW-1, GW-2, and GW-3, respectively. Dissolved oxygen (DO) values varied between 3.2 and 6.9 mg/L, and oxidation-reduction potential (ORP) values ranged from 229.8 to 282.7 mV.

**Table 59: In-situ Measurements of Groundwater Sampling Points**

| Monitoring Point | pH | Temperature (°C) | Specific Electrical Conductivity (µS/cm) | Oxidation Reduction (Redox) Potential (ORP. mV) | Dissolved Oxygen (mg/L) |
|---|---|---|---|---|---|
| GW-1 | 9.39 | 6.4 | 4400.0 | 229.8 | 3.2 |
| GW-2 | 8.01 | 13.4 | 1647.0 | 228.8 | 5.2 |
| GW-3 | 8.30 | 13.9 | 720.0 | 282.7 | 6.9 |

### *Water Quality*

The quality of the groundwater was determined by considering whether the measured values of the specified parameters exceed the quality standards. Within the scope of this study, as well as hydro chemical facies were determined by the Piper diagram, groundwater quality standards, drinking water quality standards and irrigation water quality standards were used to examine the groundwater quality.

- For the quality standards,
  - "Regulation on the Protection of Groundwater against Pollution and Deterioration" (herein after referred as "Groundwater Protection Regulation, GPR") issued by the Ministry of Forestry and Water Affairs, which was published in the Official Gazette dated 07.04.2012 and numbered 28257 (Revised: RG-12/05/2015-29363)
  - Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the Protection of Groundwater Against Pollution and Deterioration
- For drinking water quality standards,
  - "Regulation of Water Intended for Human Consumption" (RWIHC) issued by the Ministry of Health, which was published in the Official Gazette dated 17.02.2005 and numbered 25730 (Amended: RG-20/10/2016-29863)
  - Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the Quality of Water Intended for Human Consumption (recast)
  - "Guidelines for Drinking Water Quality" developed by World Health Organization (WHO, 2022)
- For the irrigation standards
  - "Irrigation Water Standards" of the US Salinity Laboratory (1954)

### *Regulation on the Protection of Groundwater against Pollution and Deterioration*

To evaluate groundwater quality, samples were examined in compliance with the Regulation on the Protection of Groundwater against Pollution and Deterioration" (herein after referred as "Groundwater Protection Regulation, GPR"). The regulation states that the number and the types of parameters, and the threshold value

to be determined for each parameter, will predicate on the groundwater body itself, taking into account the specific conditions that prevail at each groundwater body. According to the regulation, the groundwater quality standards, and the threshold values, which indicate that the groundwater is in good condition, are determined by the General Directorate of Water Management. The analysis results of the list of minimum parameters to be taken into consideration are presented in Table 60.

**Table 60: Assessment of Groundwater Samples According to GPR**

| Parameter | Unit | GW-1 | GW-2 | GW-3 |
|---|---|---|---|---|
| Arsenic | mg/L | <10.0 | <10.0 | <10.0 |
| Cadmium | mg/L | <0.5 | <0.5 | <0.5 |
| Lead | mg/L | <10.0 | <10.0 | <10.0 |
| Mercury | µg/L | <1.0 | <1.0 | <1.0 |
| Ammonium | mg/L | <0.026 | 0.030 | 0.076 |
| Chloride | mg/L | 29.674 | 73.328 | 20.836 |
| Sulphate (Dissolved) | mg/L | 114.572 | 230.144 | 29.264 |
| Trichloroethylene | µg/L | <0.2 | <0.2 | <0.2 |
| Tetrachloroethylene | µg/L | <0.2 | <0.2 | <0.2 |
| Electrical Conductivity | µS/cm | 4400 | 1647 | 720 |
| Nitrite | mg/L | 0.274 | 0.16 | 0.124 |
| Total Phosphorus | mg P/L | 0.0796 | <0.06 | <0.06 |

### *Drinking Water Quality Regulations & Standards*

In addition to protecting groundwater from deterioration, the drinking water legislation has taken into consideration for groundwater that might be used for domestic purposes.

The physical, chemical, and radiological parameters taken into consideration in the Project Standards and the comparison of limit values with measured concentrations are presented in Table 61. In addition to the chemical, physical and radiological parameters of the drinking water, the microbiological parameters also have legislative limits as per RWIHC and the Council Directive 2020/2184. For comparison, minimum values of the standards were used in order to be on the safe side.

The analysis results revealed that at all monitoring points where microbiological sampling was performed, at least one microbiological pollutant was detected. Coliform Bacteria was detected at all three (3) sampling points. Moreover, the minimum limit values for Iron and Selenium were exceeded at all monitoring points. As for Aluminium, Electrical Conductivity, Iron, Manganese, Sulphate and Sodium, the minimum limit values were also exceeded at least one monitoring point.

In terms of microbiological parameters, Coliform Bacteria were detected at all sampling points. Additionally, Enterococcus, P. Aeruginosa, Pathogenic Staphylococcus and Sulphite-reducing bacteria with anaerobic spores were detected at GW-1 and GW-2, and E.Coli was detected at GW-1.

**Table 61: Assessment of Groundwater Samples According to Drinking Water Standards**

| Parameter | Units | Standards | | | | Samples | | |
|---|---|---|---|---|---|---|---|---|
| | | Turkish Standards | EU Standards | WHO Standards | Minimum of the Standards | GW-1 | GW-2 | GW-3 |
| **Chemical Parameters** | | | | | | | | |
| 1,2-Dichloroethane | mg/l | 3 | 3 | 30 | 3 | <0.2 | <0.2 | <0.2 |
| Acrylamide | µg/l | 0.1 | 0.1 | 0.5 | 0.1 | <0.025 | <0.025 | <0.025 |
| Antimony | µg/l | 5 | 10 | 20 | 5 | <5.0 | <5.0 | <5.0 |
| Arsenic | µg/l | 10 | 10 | 10 | 10 | <10.0 | <10.0 | <10.0 |
| Benzene | µg/l | 1 | 1 | 10 | 1 | <0.2 | <0.2 | <0.2 |
| Benzo(a)pyrene | µg/l | 0.01 | 0.01 | 0.07 | 0.01 | <0.01 | <0.01 | <0.01 |
| Boron | mg/l | 1 | 1.5 | 2.4 | 1 | <0.001 | 0.0036 | <0.001 |
| Bromate | µg/l | 10 | 10 | 10 | 10 | <10.0 | <10.0 | <10.0 |
| Cadmium | mg/l | 0.005 | 0.005 | 0.003 | 0.003 | <0.5 | <0.5 | <0.5 |
| Chromium | µg/l | 50 | 25 | 50 | 25 | 10.38 | 7.051 | <5.0 |
| Copper | mg/l | 2 | 2 | 2 | 2 | 0.008 | 0.00396 | 0.02979 |
| Cyanide | µg/l | 50 | 50 | 70 | 50 | <10.00 | <10.00 | <10.00 |
| Epichlorohydrin | µg/l | 0.1 | 0.1 | 0.4 | 0.1 | <0.1 | <0.1 | <0.1 |
| Fluoride | mg/l | 1.5 | 1.5 | 1.5 | 1.5 | <0.020 | 0.309 | 0.1566 |
| Lead | µg/l | 10 | 5 | 10 | 5 | <10.0 | <10.0 | <10.0 |
| Mercury | µg/l | 1 | 1 | 6 | 1 | <1.0 | <1.0 | <1.0 |
| Nickel | µg/l | 20 | 20 | 70 | 20 | <5.0 | <5.0 | <5.0 |
| Nitrate (as $NO_3^-$) | mg/l | 50 | 50 | 50 | 50 | 46.27 | 0.88 | 0.50 |
| Nitrite (as $NO_2^-$) | mg/l | 0.5 | 0.5 | 3 | 0.5 | 0.274 | 0.160 | 0.124 |
| Polycyclic aromatic hydrocarbons | µg/l | 0.1 | 0.1 | - | 0.1 | <0.01 | <0.01 | <0.01 |
| Selenium | µg/l | 10 | 20 | 40 | 10 | 11.32 | 12.17 | 11.71 |
| Trichloroethylene | mg/l | 0.01 | 0.01 | 0.02 | 0.01 | <0.2 | <0.2 | <0.2 |
| Trihalomethanes Total | µg/l | 100 | 100 | - | 100 | <0.2 | <0.2 | <0.2 |
| Vinyl Chloride | mg/l | 0.0005 | 0.0005 | 0.0003 | 0.0003 | <0.2 | <0.2 | <0.2 |
| **Indicator Parameters** | | | | | | | | |
| Aluminum | µg/l | 200 | 200 | - | 200 | 264.8 | 161 | 97.78 |
| Ammonium | mg/l | 0.5 | 0.5 | - | 0.5 | <0.026 | 0.029571 | 0.075857 |
| Chloride | mg/l | 250 | 250 | - | 250 | 29.674 | 73.328 | 20.8356 |
| Colour | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | - | Acceptable to consumers and no abnormal change | Acceptable | Acceptable | Acceptable |
| Electrical Conductivity at 20°C ($EC_{20}$) | µS/cm | 2500 | 2500 | - | 2500 | 4400 | 1647 | 720 |
| pH | | 6.5 - 9.5 | 6.5 - 9.5 | | 6.5 - 9.5 | 9.39 | 8.01 | 8.3 |
| Iron | mg/l | 0.2 | 0.2 | | 0.2 | 674 | 52.58 | 129.1 |
| Manganese | µg/l | 50 | 50 | 40 | 40 | 22.9 | 409.2 | 17.8 |
| Odor | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | | Acceptable to consumers and no abnormal change | Acceptable | Acceptable | Acceptable |
| Oxidisability | mg/l $O_2$ | 5 | 5 | | 5 | <2.80 | <2.80 | <2.80 |
| Sulphate | mg/l | 250 | 250 | | 250 | 144.95 | 281.37 | 35.62 |
| Sodium (Total) | mg/l | 200 | 200 | | 200 | 74.26 | 280.3 | 59.69 |
| Taste | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | | Acceptable to consumers and no abnormal change | Acceptable | Acceptable | Acceptable |
| Total organic carbon (TOC) | mg/l | No abnormal change | No abnormal change | | No abnormal change | 1.901 | 1.929 | 2.248 |

| Parameter | Units | Standards | | | | Samples | | |
|---|---|---|---|---|---|---|---|---|
| | | Turkish Standards | EU Standards | WHO Standards | Minimum of the Standards | GW-1 | GW-2 | GW-3 |
| Turbidity | | Acceptable to consumers and no abnormal change | Acceptable to consumers and no abnormal change | | Acceptable to consumers and no abnormal change | 1 | 22.9 | 1.39 |
| **Pesticides** | | | | | | | | |
| 2,4 Acid* | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| 2,4,5-T* | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Aclonifen* | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Atrazine | µg/l | 0.1 | 0.1 | 2 | 0.1 | <0,05 | <0,05 | <0,05 |
| Bentazone* | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Bifenox* | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Boscalid | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Bromoxynl* | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Carbaryl | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Carbendazim* | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Carbofuran | µg/l | 0.1 | 0.1 | 7 | 0.1 | <0,05 | <0,05 | <0,05 |
| Chlorfenvinphos | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Clothianidin | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Cybutryn | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Dichlorvos | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Dimethoate | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Diuron | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Ethoprophos | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| ETU | µg/l | 0.1 | 0.1 | - | 0.1 | <0,1 | <0,1 | <0,1 |
| Fenarimol | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Fenthion | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Hexythiazox | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Imazalil | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Imidachloprid | µg/l | 0.1 | 0.1 | - | 0.1 | <0,05 | <0,05 | <0,05 |
| Isoproturon | µg/l | 0.1 | 0.1 | 9 | 0.1 | <0,05 | <0,05 | <0,05 |
| Linuron | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Malathion | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| MCA* | µg/l | 0.1 | 0.1 | | 0.1 | <0,1 | <0,1 | <0,1 |
| Metalaxyl | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Methidathion | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Methomyl | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Methoxyfenozide | µg/l | 0.1 | 0.1 | | 0.1 | <0,1 | <0,1 | <0,1 |
| Metolachlor | µg/l | 0.1 | 0.1 | 10 | 0.1 | <0,05 | <0,05 | <0,05 |
| Molinate | µg/l | 0.1 | 0.1 | 6 | 0.1 | <0,05 | <0,05 | <0,05 |
| Monocrotophos | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Myclobutanil | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Omethoate | µg/l | 0.1 | 0.1 | | 0.1 | <0,1 | <0,1 | <0,1 |
| Oxadiazon | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Oxadixil | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Pendimethalin | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Piperonyl butoxide | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Propazine | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Propiconazole | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |

| Parameter | Units | Standards | | | | Samples | | |
|---|---|---|---|---|---|---|---|---|
| | | Turkish Standards | EU Standards | WHO Standards | Minimum of the Standards | GW-1 | GW-2 | GW-3 |
| Propyzamide | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Quinoxyfen | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Simazine | µg/l | 0.1 | 0.1 | 2 | 0.1 | <0,05 | <0,05 | <0,05 |
| Terbutryn | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Thiophonate Methyl* | µg/l | 0.1 | 0.1 | | 0.1 | <0,1 | <0,1 | <0,1 |
| Triadimenol | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Tribenuron-methyl* | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Triclosan* | µg/l | 0.1 | 0.1 | | 0.1 | <0,1 | <0,1 | <0,1 |
| Tritosulfuron | µg/l | 0.1 | 0.1 | | 0.1 | <0,05 | <0,05 | <0,05 |
| Pesticides Total | µg/l | 0.5 | 0.5 | - | 0.5 | <0.1 | <0.1 | <0.1 |
| **Microbiologic Parameters** | | | | | | | | |
| Colony count at 22 °C | number/mL | 20 | - | - | 20 | 700 | 120 | 33 |
| Colony count at 37 °C | number/mL | 5 | - | - | 5 | 91 | 39 | 13 |
| E.coli | number/100mL | 0 | 0 | - | 0 | 2 | 0 | 0 |
| Enterococcus | number/100mL | 0 | 0 | - | 0 | 5 | 1 | 0 |
| P. Aeruginosa | number/100mL | 0 | - | - | 0 | 35 | 62 | 0 |
| Parasites | number/5L | 0 | - | - | 0 | 0 | 0 | 83 |
| Pathogenic Staphylococcus | number/100mL | 0 | - | - | 0 | 13 | 17 | 0 |
| Sulfite-reducing bacteria with anaerobic spores | number/50mL | 0 | - | - | 0 | 36 | 21 | 0 |
| Total/Fecal Coliform Bacteria | number/100mL | 0 | 0 | - | 0 | 982 | 990 | 25 |
| C. perfringens (including spores) | number/100ml | 0 | 0 | - | 0 | 0 | 0 | 0 |
| **Radioactivity Parameters** | | | | | | | | |
| Tritium | Bq/L | 100 | - | 10000 | 100 | <10 | <10 | <10 |
| Total Indicative Dose – alpha activity | mSv/year | 0.1 | - | - | 0.1 | 0.04 | 0.06 | <0.04 |
| Total Indicative Dose – beta activity | mSv/year | 0.1 | - | - | 0.1 | <0.05 | <0.10 | <0.10 |

### *Irrigation Water Quality Standards*

Groundwater can be used as irrigation water by the surrounding settlements[47]. Therefore, its quality for use as irrigation water should also be assessed according to the U.S. Salinity Diagram. Based on this analysis, the water in GW-1 is categorized as C4S1 (very high saline, low-sodium), GW-2 is classified as C3S2 (high-saline, medium-sodium), and GW-3 is categorized as C2S1 (medium-saline, low-sodium) class, which indicates that GW-1 is not suitable for irrigation (Figure 58).

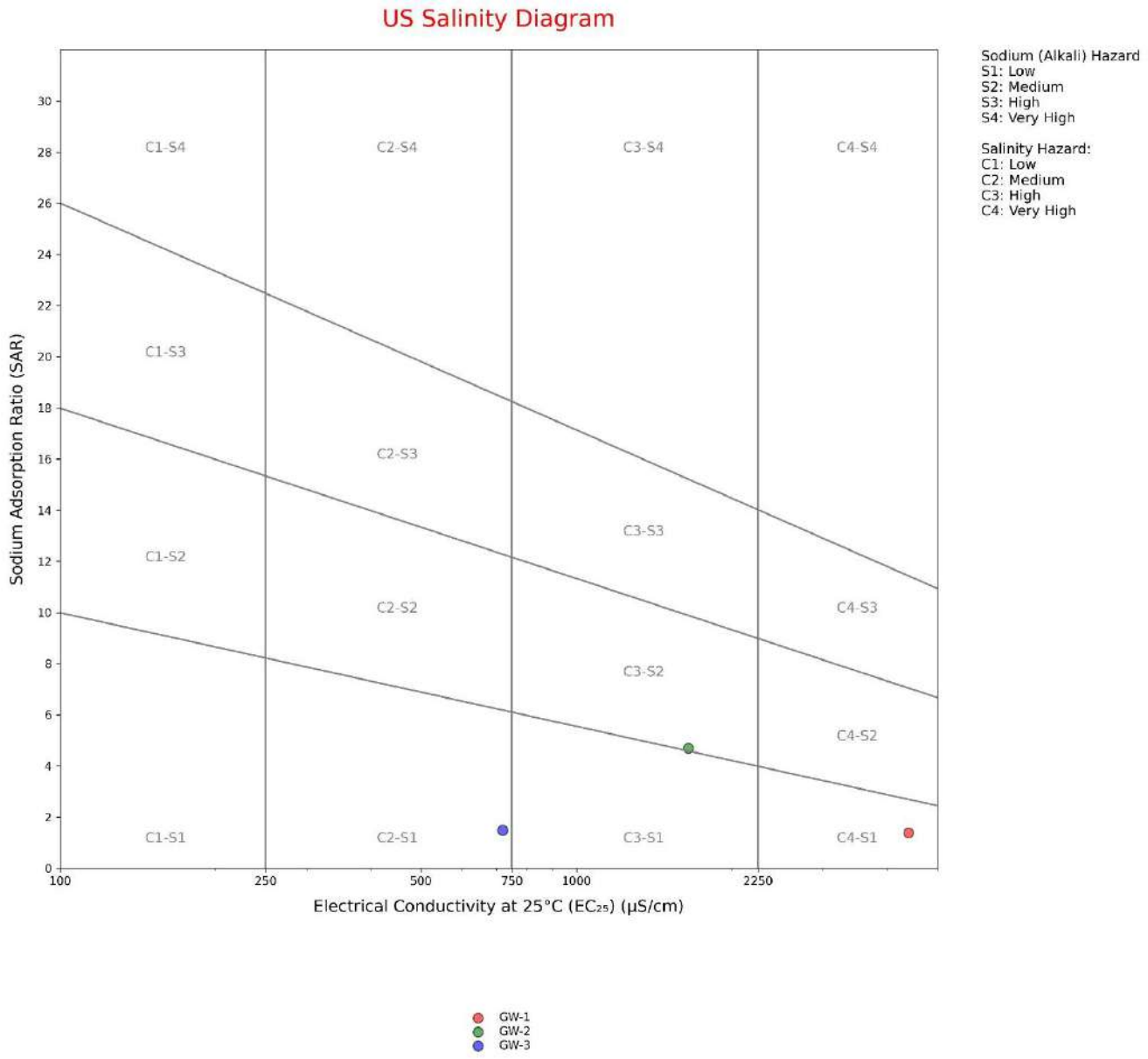



**Figure 58: US Salinity Diagram for Groundwater Samples**

[47] DSİ. (2018). Thracian Part of the Marmara Basin, Master Plan Report. Ankara: DSİ.

### 6.1.8 Air Quality

During the construction phase of the Project, dust emissions will be generated due to the cut excavation / backfilling activities on the motorway route, excavation activities to be carried out for the engineering structures, and the production activities in the material sites to be operated in order to supply the filling and concrete aggregate material required in the Project. In addition, exhaust emissions from the vehicles in the construction phase will create air emissions.

In addition to the construction phase, during the operation phase of the Project, exhaust emissions ($NO_2$, $PM_{10}$, etc.) are expected to occur as a result of road traffic.

This section of the ESIA Report represents the baseline conditions for air quality in the AoI. In order to determine the background concentrations in the AoI, air quality measurement studies (for $PM_{10}$, $PM_{2.5}$, $NO_2$, $SO_2$ and settled dust) were conducted at pre-determined locations along the planned roadway. Details related to these measurements are given below section.

#### *Baseline Air Quality Measurement*

In order to assess the baseline air quality within the AoI, 66 representative measurement locations for $PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_2$ and settled dust parameters have been determined considering the closest residential areas to the motorway route and other Project components. Following baseline air quality measurements were conducted by TÜRKAK accredited BATI Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti ("Batı Laboratuvarı"):

- Daily $PM_{10}$ and $PM_{2.5}$ measurements were performed for 24 hours continuously at each measurement location in September 2022, in line with TS EN 12341 standard.
- 2-months settled dust measurements were conducted between 19$^{th}$ of September 2022 and 17$^{th}$ of November 2022, in line with TS 2342 standard.
- Monthly $NO_2$ and $SO_2$ measurements were conducted for 2 months between 19$^{th}$ of September 2022 and 17$^{th}$ of November 2022 via passive diffusion tubes in line with TS EN 13528 – 1, 2, 3 standards.

The locations and details of measurement points are given in Table 62 and Figure 59. Measurement results compared with Turkish and European limit values as well as IFC standards are given in Table 63 and Table 64.

- The official Air Quality Measurement Report for $PM_{10}$, $PM_{2.5}$, settled dust, $NO_2$ and $SO_2$ prepared by BATI Laboratuvarı is presented in Appendix C.

The analysis results are compared with the Turkish and European limit values as well as IFC standards. Accordingly;

- All $PM_{10}$ measurement results are below the regulatory limit value, which is 50 µg/m³. Highest $PM_{10}$ concentration is measured as 25.8 µg/m³ at AQ-3 air quality measurement location, which is a residential receptor and close to the storage area (with a distance of 2,150 m).
- All $PM_{2.5}$ measurement results are below the regulatory limit value, which is 25 µg/m³ and IFC standard (20 µg/m³). Highest $PM_{2.5}$ concentration is measured as 13.3 µg/m³ at AQ-36 air quality measurement location, which is a residential receptor having a distance of 1,000 m to the motorway route.
- All Settling Dust measurement results are below the regulatory limit values, which are 210 mg/m²day for long term value and 390 mg/m²day for short term value. Highest settling dust concentration is measured as 104.2

mg/m²day and 111.89 mg/m²day for long term and short term, respectively, at AQ-2 air quality measurement station, which is a commercial receptor and having a distance of 680 m to the motorway route.

- All average $SO_2$ and $NO_2$ measurement results are below the regulatory limit values, which is 20 µg/m³ and 40 µg/m³, respectively. Highest $SO_2$ concentration is measured as 12.94 µg/m³ and highest $NO_2$ concentration is measured as 12.62 µg/m³ at AQ-54 and AQ-17 air quality measurement locations, respectively.

**Table 62: Information on Air Quality Measurement Stations**

| Air Quality | Coordinates (ED50 UTM Zone 35) | | Corresponding Motorway or Junction (km) | Province | District | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Station | X | Y | | | | | | | |
| AQ - 1 | 506304 | 4525649 | 103+500 | Tekirdağ | Malkara | Ahievren | Residential | Motorway Route | 850 |
| AQ - 2 | 507026 | 4525865 | 102+700 | Tekirdağ | Malkara | Ahievren | Commercial | Motorway Route | 680 |
| AQ - 3 | 512447 | 4524860 | 98+500 | Tekirdağ | Malkara | Vakıfiğdemir | Residential | Borrow Pit | 3,000 |
| AQ - 4 | 508327 | 4528503 | 100+000 | Tekirdağ | Malkara | Hereke | Residential | Motorway Route | 1,560 |
| AQ - 5 | 511329 | 4529048 | 97+400 | Tekirdağ | Malkara | Yenice | Residential | Motorway Route | 600 |
| AQ - 6 | 512481 | 4527410 | 96+600 | Tekirdağ | Malkara | Dereköy | Residential | Borrow Pit | 400 |
| AQ - 7 | 514647 | 4529428 | 94+400 | Tekirdağ | Süleymanpaşa | Kınıklar | Residential | Storage Area | 260 |
| AQ - 8 | 517267 | 4531152 | 91+000 | Tekirdağ | Süleymanpaşa | Mahramlı | Residential | Borrow Pit | 240 |
| AQ - 9 | 518048 | 4529257 | 90+700 | Tekirdağ | Süleymanpaşa | Akçahalil | Residential | Motorway Route | 520 |
| AQ - 10 | 520889 | 4531560 | 87+500 | Tekirdağ | Süleymanpaşa | Otmanlı | Commercial | Motorway Route | 980 |
| AQ - 11 | 523258 | 4530892 | 85+250 | Tekirdağ | Süleymanpaşa | İnecik | Residential | Motorway Route | 40 |
| AQ - 12 | 523424 | 4532271 | 84+600 | Tekirdağ | Süleymanpaşa | İnecik Bucağı | Residential | Motorway Route | 1,250 |
| AQ - 13 | 525104 | 4531792 | 83+100 | Tekirdağ | Süleymanpaşa | İnecik | Commercial | Motorway Route | 260 |
| AQ - 14 | 526810 | 4533248 | 81+000 | Tekirdağ | Süleymanpaşa | Nusratfakı | Commercial | Motorway Route | 700 |
| AQ - 15 | 527803 | 4532372 | 80+400 | Tekirdağ | Süleymanpaşa | Nusratfakı | Residential | Motorway Route | 460 |
| AQ - 16 | 529586 | 4535472 | 77+100 | Tekirdağ | Süleymanpaşa | Güvençli | Residential | Motorway Route | 520 |
| AQ - 17 | 526412 | 4540054 | 77+500 | Tekirdağ | Süleymanpaşa | Ferhadanlı | Residential | Storage Area | 4,600 |
| AQ - 18 | 529123 | 4539993 | 74+500 | Tekirdağ | Süleymanpaşa | Hacıköy | Residential | Storage Area | 2,800 |
| AQ - 19 | 531279 | 4536789 | 74+600 | Tekirdağ | Süleymanpaşa | Seymenli | Residential | Storage Area | 460 |
| AQ - 20 | 532720 | 4533451 | 75+500 | Tekirdağ | Süleymanpaşa | Karahisarlı | Residential | Motorway Route | 1,500 |
| AQ - 21 | 531830 | 4540355 | 71+700 | Tekirdağ | Süleymanpaşa | Bıyıkali | Residential | Storage Area | 2,200 |
| AQ - 22 | 536037 | 4539504 | 69+400 | Tekirdağ | Süleymanpaşa | Yağcı | Residential | Motorway Route | 560 |
| AQ - 23 | 536539 | 4538863 | 69+500 | Tekirdağ | Süleymanpaşa | Yağcı | Residential | Storage Area | 450 |
| AQ - 24 | 537824 | 4539890 | 67+200 | Tekirdağ | Süleymanpaşa | Yağcı | Residential | Motorway Route | 330 |
| AQ - 25 | 539411 | 4540869 | 65+000 | Tekirdağ | Süleymanpaşa | Yağcı | Commercial | Motorway Route | 1,000 |
| AQ - 26 | 540434 | 4541505 | 63+700 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 270 |
| AQ - 27 | 540971 | 4541733 | 63+400 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 190 |
| AQ - 28 | 543152 | 4541306 | 61+000 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 20 |
| AQ - 29 | 544184 | 4540051 | 59+500 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 450 |
| AQ - 30 | 544146 | 4541848 | 60+100 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 600 |
| AQ - 31 | 545253 | 4541473 | 59+100 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 660 |
| AQ - 32 | 546711 | 4539397 | 56+900 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 250 |
| AQ - 33 | 548595 | 4539816 | 55+050 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 220 |
| AQ - 34 | 548702 | 4539432 | 54+900 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 150 |
| AQ - 35 | 549591 | 4541426 | 53+500 | Tekirdağ | Süleymanpaşa | Köseilyas | Commercial | Storage Area | 290 |
| AQ - 36 | 550732 | 4538571 | 53+200 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 1,000 |
| AQ - 37 | 552631 | 4538392 | 51+500 | Tekirdağ | Süleymanpaşa | Gazioğlu | Residential | Motorway Route | 50 |
| AQ - 38 | 553205 | 4542666 | 49+000 | Tekirdağ | Süleymanpaşa | Gazioğlu | Residential | Motorway Route | 960 |
| AQ - 39 | 552391 | 4544142 | 48+100 | Tekirdağ | Süleymanpaşa | Husunlu | Residential | Motorway Route | 560 |
| AQ - 40 | 555979 | 4543689 | 45+000 | Tekirdağ | Süleymanpaşa | Karaevli | Residential | Motorway Route | 900 |

| Air Quality | Coordinates (ED50 UTM Zone 35) | | Corresponding Motorway or Junction (km) | Province | District | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) |
|---|---|---|---|---|---|---|---|---|---|
| Measurement Station | X | Y | | | | | | | |
| AQ - 41 | 560252 | 4541820 | 40+700 | Tekirdağ | Çorlu | Yenice | Residential | Motorway Route | 3,600 |
| AQ - 42 | 562560 | 4548340 | 37+700 | Tekirdağ | Çorlu | Yenice | Residential | Motorway Route | 660 |
| AQ - 43 | 568345 | 4548605 | 31+300 | Tekirdağ | Çorlu | Türkgücü | Residential | Borrow Pit | 820 |
| AQ - 44 | 569553 | 4546810 | 30+900 | Tekirdağ | Çorlu | Türkgücü | Residential | Motorway Route | 60 |
| AQ - 45 | 570179 | 4544497 | 31+000 | Tekirdağ | Marmaraereğlisi | Çeşmeli | Residential | Storage Area | 960 |
| AQ - 46 | 571561 | 4544339 | 28+500 | Tekirdağ | Marmaraereğlisi | Türkmenli | Residential | Storage Area | 850 |
| AQ - 47 | 574485 | 4548016 | 25+800 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 1,050 |
| AQ - 48 | 575243 | 4549478 | 25+000 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 1,080 |
| AQ - 49 | 578865 | 4549326 | 21+500 | Tekirdağ | Çorlu | Seymen | Residential | Storage Area | 850 |
| AQ - 50 | 576553 | 4551925 | 24+500 | Tekirdağ | Çorlu | Seymen | Residential | Motorway Route | 500 |
| AQ - 51 | 576083 | 4547951 | 24+300 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 280 |
| AQ - 52 | 580170 | 4547562 | 20+100 | Tekirdağ | Çorlu | Seymen | Residential | Motorway Route | 330 |
| AQ - 53 | 580496 | 4543970 | 20+000 | Tekirdağ | Marmaraereğlisi | Sultanköy | Residential | Motorway Route | 1,220 |
| AQ - 54 | 580800 | 4538257 | 20+000 | Tekirdağ | Marmaraereğlisi | Kamaradere | Residential | Motorway Route | 6,300 |
| AQ - 55 | 584542 | 4543854 | 17+000 | İstanbul | Silivri | Gümüşkaya | Residential | Storage Area | 1,450 |
| AQ - 56 | 585305 | 4548356 | 14+800 | İstanbul | Silivri | Değirmenköy | Commercial | Motorway Route | 260 |
| AQ - 57 | 588165 | 4548686 | 12+500 | İstanbul | Silivri | Balaban | Commercial | Motorway Route | 140 |
| AQ - 58 | 586482 | 4550068 | 12+500 | İstanbul | Silivri | Fevzipaşa | Residential | Motorway Route | 650 |
| AQ - 59 | 588893 | 4551243 | 9+800 | İstanbul | Silivri | Balaban | Residential | Motorway Route | 90 |
| AQ - 60 | 588814 | 4554537 | 10+000 | İstanbul | Silivri | İsmetpaşa | Residential | Borrow Pit | 2,900 |
| AQ - 61 | 590046 | 4559119 | 9+500 | İstanbul | Silivri | Balaban | Residential | Borrow Pit | 1,050 |
| AQ - 62 | 591885 | 4549968 | 6+500 | İstanbul | Silivri | Çeltik | Residential | Motorway Route | 1,000 |
| AQ - 63 | 594479 | 4549787 | 4+000 | İstanbul | Silivri | Çeltik | Residential | Motorway Route | 600 |
| AQ - 64 | 596095 | 4549550 | 2+800 | İstanbul | Silivri | Semizkumlar | Residential | Motorway Route | 1,160 |
| AQ - 65 | 595540 | 4551890 | 2+400 | İstanbul | Silivri | Yolçatı | Residential | Storage Area | 750 |
| AQ - 66 | 599081 | 4551537 | 0+000 | İstanbul | Silivri | Alipaşa | Commercial | Motorway Route | 1,110 |

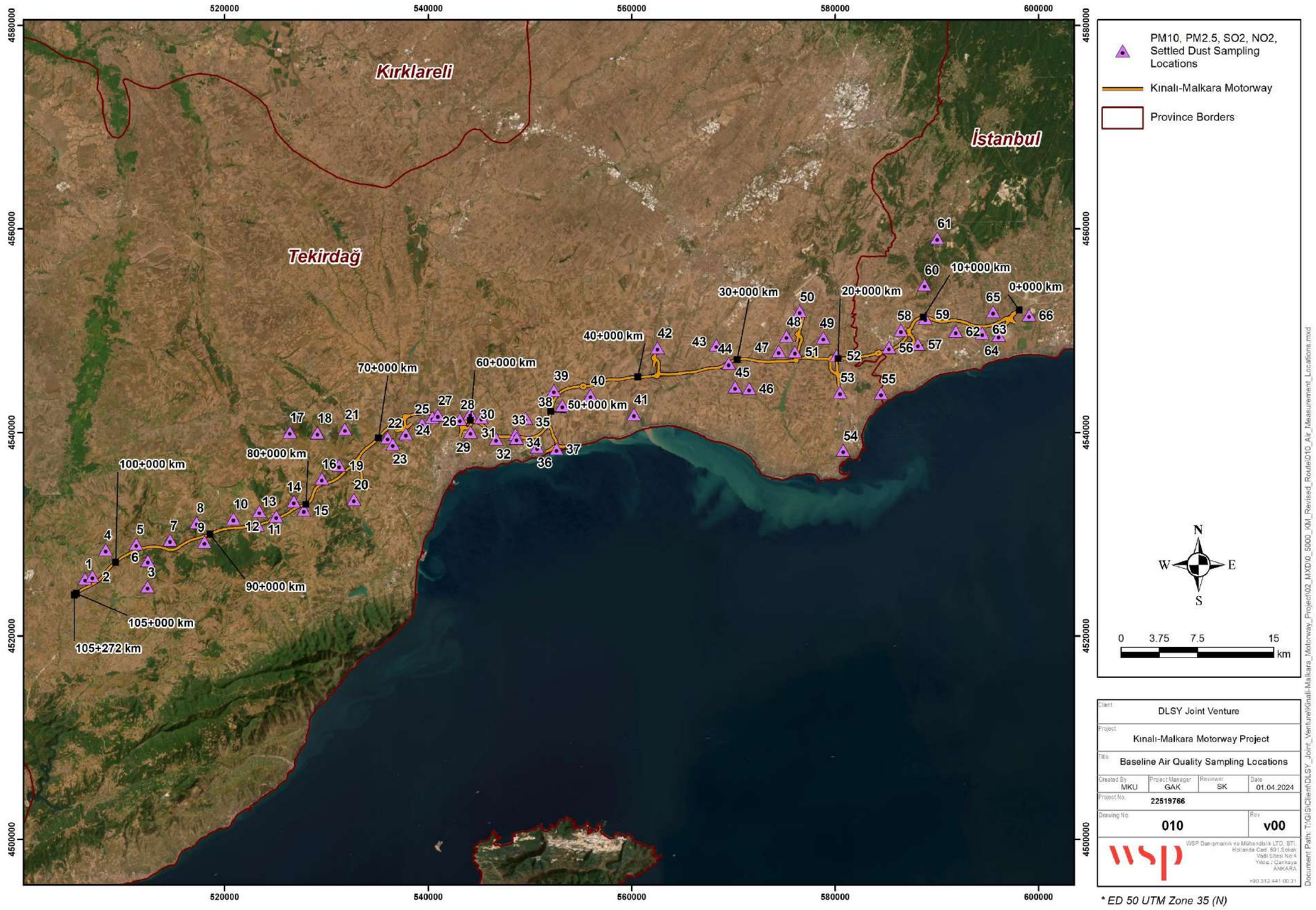



**Figure 59: Map Showing Baseline Air Quality Measurement Locations**

**Table 63: $PM_{10}$, $PM_{2.5}$ and Settled Dust Measurement Results**

| Air Quality Measurement Location | Corresponding Motorway or Junction (km) | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | $PM_{10}$ Concentration (µg/m³) | $PM_{2.5}$ Concentration (µg/m³) | Settled Dust (mg/m².day) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Long Term Value | Short Term Value |
| AQ - 1 | 103+500 | Ahievren | Residential | Motorway Route | 850 | 17.1 | 9.4 | 94.99 | 98.42 |
| AQ - 2 | 102+700 | Ahievren | Commercial | Motorway Route | 680 | 25.6 | 10.5 | 104.20 | 111.89 |
| AQ - 3 | 98+500 | Vakıfiğdemir | Residential | Borrow Pit | 3,000 | 25.8 | 10.2 | 93.83 | 100.61 |
| AQ - 4 | 100+000 | Hereke | Residential | Motorway Route | 1,560 | 21.5 | 12.3 | 82.36 | 87.69 |
| AQ - 5 | 97+400 | Yenice | Residential | Motorway Route | 600 | 20.7 | 6.9 | 94.27 | 101.71 |
| AQ - 6 | 96+600 | Dereköy | Residential | Borrow Pit | 400 | 21.3 | 4.2 | 102.22 | 110.25 |
| AQ - 7 | 94+400 | Kınıklar | Residential | Storage Area | 260 | 25.4 | 10.4 | 70.85 | 77.70 |
| AQ - 8 | 91+000 | Mahramlı | Residential | Borrow Pit | 240 | 19.9 | 5.9 | 83.72 | 93.10 |
| AQ - 9 | 90+700 | Akçahalil | Residential | Motorway Route | 520 | 16.6 | 9.7 | 61.29 | 67.28 |
| AQ - 10 | 87+500 | Otmanlı | Commercial | Motorway Route | 980 | 22.3 | 8.3 | 86.19 | 93.79 |
| AQ - 11 | 85+250 | İnecik | Residential | Motorway Route | 40 | 16.7 | 9.4 | 79.28 | 83.71 |
| AQ - 12 | 84+600 | İnecik Bucağı | Residential | Motorway Route | 1,250 | 16.8 | 8.8 | 87.44 | 95.98 |
| AQ - 13 | 83+100 | İnecik | Commercial | Motorway Route | 260 | 22.1 | 9.1 | 80.31 | 87.34 |
| AQ - 14 | 81+000 | Nusratfakı | Commercial | Motorway Route | 700 | 22.0 | 9.1 | 84.88 | 92.31 |
| AQ - 15 | 80+400 | Nusratfakı | Residential | Motorway Route | 460 | 21.7 | 10.1 | 63.89 | 67.94 |
| AQ - 16 | 77+100 | Güvençli | Residential | Motorway Route | 520 | 25.1 | 9.5 | 92.78 | 101.67 |
| AQ - 17 | 77+500 | Ferhadanlı | Residential | Storage Area | 4,600 | 21.6 | 11.9 | 73.66 | 78.76 |
| AQ - 18 | 74+500 | Hacıköy | Residential | Storage Area | 2,800 | 16.1 | 9.7 | 87.08 | 93.81 |
| AQ - 19 | 74+600 | Seymenli | Residential | Storage Area | 460 | 21.8 | 9.4 | 73.93 | 79.69 |
| AQ - 20 | 75+500 | Karahisarlı | Residential | Motorway Route | 1,500 | 24.0 | 10.5 | 64.96 | 69.72 |
| AQ - 21 | 71+700 | Bıyıkali | Residential | Storage Area | 2,200 | 23.4 | 10.2 | 67.64 | 72.28 |
| AQ - 22 | 69+400 | Yağcı | Residential | Motorway Route | 560 | 23.2 | 10.8 | 74.54 | 79.22 |
| AQ - 23 | 69+500 | Yağcı | Residential | Storage Area | 450 | 17.4 | 11.2 | 59.92 | 64.03 |
| AQ - 24 | 67+200 | Yağcı | Residential | Motorway Route | 330 | 16.6 | 12.3 | 58.66 | 60.08 |
| AQ - 25 | 65+000 | Yağcı | Commercial | Motorway Route | 1,000 | 21.8 | 10.3 | 65.48 | 69.97 |
| AQ - 26 | 63+700 | Kayı | Residential | Motorway Route | 270 | 23.1 | 8.9 | 77.92 | 83.27 |
| AQ - 27 | 63+400 | Kayı | Residential | Motorway Route | 190 | 24.3 | 10.5 | 68.99 | 72.49 |
| AQ - 28 | 61+000 | Kayı | Residential | Motorway Route | 20 | 24.1 | 8.1 | 74.07 | 78.71 |
| AQ - 29 | 59+500 | Kayı | Residential | Motorway Route | 450 | 23.0 | 7.4 | 79.40 | 83.68 |
| AQ - 30 | 60+100 | Kayı | Residential | Motorway Route | 600 | 25.4 | 9.9 | 69.79 | 73.96 |
| AQ - 31 | 59+100 | Kayı | Residential | Motorway Route | 660 | 22.6 | 9.7 | 81.99 | 86.78 |
| AQ - 32 | 56+900 | Köseilyas | Residential | Motorway Route | 250 | 16.6 | 11.2 | 70.46 | 75.59 |
| AQ - 33 | 55+050 | Köseilyas | Residential | Motorway Route | 220 | 24.3 | 8.6 | 63.62 | 67.57 |

| Air Quality Measurement Location | Corresponding Motorway or Junction (km) | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | $PM_{10}$ Concentration (µg/m³) | $PM_{2.5}$ Concentration (µg/m³) | Settled Dust (mg/m².day) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Long Term Value | Short Term Value |
| AQ - 34 | 54+900 | Köseilyas | Residential | Motorway Route | 150 | 24.9 | 10.3 | 76.23 | 80.89 |
| AQ - 35 | 53+500 | Köseilyas | Commercial | Storage Area | 290 | 24.0 | 12.5 | 82.92 | 88.18 |
| AQ - 36 | 53+200 | Köseilyas | Residential | Motorway Route | 1,000 | 22.3 | 13.3 | 74.82 | 80.07 |
| AQ - 37 | 51+500 | Gazioğlu | Residential | Motorway Route | 50 | 15.8 | 12.0 | 65.50 | 70.43 |
| AQ - 38 | 49+000 | Gazioğlu | Residential | Motorway Route | 960 | 25.3 | 11.4 | 72.02 | 75.70 |
| AQ - 39 | 48+100 | Husunlu | Residential | Motorway Route | 560 | 25.6 | 9.2 | 75.47 | 79.04 |
| AQ - 40 | 45+000 | Karaevli | Residential | Motorway Route | 900 | 21.8 | 11.1 | 80.37 | 84.86 |
| AQ - 41 | 40+700 | Yenice | Residential | Motorway Route | 3,600 | 16.8 | 9.4 | 82.83 | 88.65 |
| AQ - 42 | 37+700 | Yenice | Residential | Motorway Route | 660 | 22.4 | 10.8 | 70.43 | 76.84 |
| AQ - 43 | 31+300 | Türkgücü | Residential | Borrow Pit | 820 | 24.0 | 11.6 | 84.70 | 93.25 |
| AQ - 44 | 30+900 | Türkgücü | Residential | Motorway Route | 60 | 24.4 | 12.4 | 75.78 | 83.18 |
| AQ - 45 | 31+000 | Çeşmeli | Residential | Storage Area | 960 | 24.9 | 11.8 | 82.47 | 89.73 |
| AQ - 46 | 28+500 | Türkmenli | Residential | Storage Area | 850 | 23.1 | 9.7 | 81.14 | 85.68 |
| AQ - 47 | 25+800 | Yakuplu | Residential | Motorway Route | 1,050 | 20.3 | 12.9 | 88.21 | 94.32 |
| AQ - 48 | 25+000 | Yakuplu | Residential | Motorway Route | 1,080 | 14.8 | 11.0 | 69.00 | 73.37 |
| AQ - 49 | 21+500 | Seymen | Residential | Storage Area | 850 | 23.8 | 10.4 | 80.26 | 85.78 |
| AQ - 50 | 24+500 | Seymen | Residential | Motorway Route | 500 | 23.3 | 10.6 | 77.17 | 82.02 |
| AQ - 51 | 24+300 | Yakuplu | Residential | Motorway Route | 280 | 23.5 | 7.5 | 84.07 | 88.61 |
| AQ - 52 | 20+100 | Seymen | Residential | Motorway Route | 330 | 19.5 | 8.5 | 77.22 | 81.74 |
| AQ - 53 | 20+000 | Sultanköy | Residential | Motorway Route | 1,220 | 18.9 | 9.3 | 90.37 | 96.09 |
| AQ - 54 | 20+000 | Kamaradere | Residential | Motorway Route | 6,300 | 15.1 | 7.9 | 80.81 | 86.47 |
| AQ - 55 | 17+000 | Gümüşkaya | Residential | Storage Area | 1,450 | 20.0 | 7.8 | 64.17 | 68.99 |
| AQ - 56 | 14+800 | Değirmenköy | Commercial | Motorway Route | 260 | 19.9 | 9.0 | 72.73 | 77.07 |
| AQ - 57 | 12+500 | Balaban | Commercial | Motorway Route | 140 | 15.1 | 10.0 | 69.96 | 74.34 |
| AQ - 58 | 12+500 | Fevzipaşa | Residential | Motorway Route | 650 | 22.1 | 9.0 | 67.59 | 72.86 |
| AQ - 59 | 9+800 | Balaban | Residential | Motorway Route | 90 | 21.0 | 8.5 | 56.66 | 60.08 |
| AQ - 60 | 10+000 | İsmetpaşa | Residential | Borrow Pit | 2,900 | 13.5 | 9.0 | 72.77 | 77.77 |
| AQ - 61 | 9+500 | Balaban | Residential | Borrow Pit | 1,050 | 15.3 | 8.3 | 68.58 | 71.43 |
| AQ - 62 | 6+500 | Çeltik | Residential | Motorway Route | ,000 | 23.5 | 7.3 | 78.83 | 83.64 |
| AQ - 63 | 4+000 | Çeltik | Residential | Motorway Route | 600 | 19.4 | 7.6 | 88.19 | 92.69 |
| AQ - 64 | 2+800 | Semizkumlar | Residential | Motorway Route | 1,160 | 21.3 | 6.2 | 94.02 | 102.26 |
| AQ - 65 | 2+400 | Yolçatı | Residential | Storage Area | 750 | 14.4 | 7.5 | 77.21 | 82.51 |
| AQ - 66 | 0+000 | Alipaşa | Commercial | Motorway Route | 1,110 | 20.4 | 10.3 | 84.88 | 92.31 |
| **Turkish Air Quality Standards[1]** | | | | | | **50.0** | **-** | **210.00** | **390.00** |

| Air Quality Measurement Location | Corresponding Motorway or Junction (km) | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | $PM_{10}$ Concentration (µg/m³) | $PM_{2.5}$ Concentration (µg/m³) | Settled Dust (mg/m².day) | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Long Term Value | Short Term Value |
| **IFC Air Quality Standards[2]** | | | | | | **50.0** | **25.0** | - | - |
| **European Directives Air Quality Standards[3]** | | | | | | **50.0** | **20.0** | - | - |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)
[2] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)
[3] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air

**Table 64: $SO_2$ and $NO_2$ Measurement Results**

| Air Quality Monitoring Station | Corresponding Motorway or Junction (km) | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | $SO_2$ (µg/m³) | | | $NO_2$ (µg/m³) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Mid Sep- Mid Oct 2022 | Mid Oct -Mid Nov 2022 | Avg. | Mid Sep- Mid Oct 2022 | Mid Oct -Mid Nov 2022 | Avg. |
| AQ-1 | 103+500 | Ahievren | Residential | Motorway Route | 850 | 7.80 | 12.33 | 10.07 | 8.81 | 10.57 | 9.69 |
| AQ-2 | 102+700 | Ahievren | Commercial | Motorway Route | 680 | 7.61 | 12.02 | 9.82 | 8.26 | 11.89 | 10.08 |
| AQ-3 | 98+500 | Vakıfiğdemir | Residential | Borrow Pit | 3,000 | 7.65 | 12.09 | 9.87 | 8.09 | 11.65 | 9.87 |
| AQ-4 | 100+000 | Hereke | Residential | Motorway Route | 1,560 | 7.49 | 11.84 | 9.67 | 9.12 | 13.13 | 11.13 |
| AQ-5 | 97+400 | Yenice | Residential | Motorway Route | 600 | 8.45 | 13.35 | 10.90 | 9.45 | 13.61 | 11.53 |
| AQ-6 | 96+600 | Dereköy | Residential | Borrow Pit | 400 | 8.75 | 13.83 | 11.29 | 9.63 | 13.87 | 11.75 |
| AQ-7 | 94+400 | Kınıklar | Residential | Storage Area | 260 | 8.92 | 14.10 | 11.51 | 9.14 | 13.16 | 11.15 |
| AQ-8 | 91+000 | Mahramlı | Residential | Borrow Pit | 240 | 8.47 | 13.38 | 10.93 | 8.89 | 12.80 | 10.85 |
| AQ-9 | 90+700 | Akçahalil | Residential | Motorway Route | 520 | 8.24 | 13.01 | 10.63 | 8.44 | 12.15 | 10.30 |
| AQ-10 | 87+500 | Otmanlı | Commercial | Motorway Route | 980 | 7.82 | 12.35 | 10.09 | 8.93 | 12.86 | 10.90 |
| AQ-11 | 85+250 | İnecik | Residential | Motorway Route | 40 | 8.27 | 13.07 | 10.67 | 9.27 | 13.35 | 11.31 |
| AQ-12 | 84+600 | İnecik Bucağı | Residential | Motorway Route | 1,250 | 8.59 | 13.57 | 11.08 | 9.11 | 13.12 | 11.12 |
| AQ-13 | 83+100 | İnecik | Commercial | Motorway Route | 260 | 8.44 | 13.33 | 10.89 | 9.31 | 13.41 | 11.36 |
| AQ-14 | 81+000 | Nusratfakı | Commercial | Motorway Route | 700 | 8.62 | 13.63 | 11.13 | 10.08 | 14.52 | 12.30 |
| AQ-15 | 80+400 | Nusratfakı | Residential | Motorway Route | 460 | 9.34 | 14.75 | 12.05 | 10.19 | 14.67 | 12.43 |
| AQ-16 | 77+100 | Güvençli | Residential | Motorway Route | 520 | 9.44 | 14.92 | 12.18 | 10.28 | 14.80 | 12.54 |
| AQ-17 | 77+500 | Ferhadanlı | Residential | Storage Area | 4,600 | 9.52 | 15.05 | 12.29 | 10.34 | 14.89 | 12.62 |
| AQ-18 | 74+500 | Hacıköy | Residential | Storage Area | 2,800 | 9.58 | 15.13 | 12.36 | 9.65 | 13.90 | 11.78 |
| AQ-19 | 74+600 | Seymenli | Residential | Storage Area | 460 | 8.94 | 14.12 | 11.53 | 9.73 | 14.01 | 11.87 |
| AQ-20 | 75+500 | Karahisarlı | Residential | Motorway Route | 1,500 | 9.01 | 14.24 | 11.63 | 9.49 | 13.67 | 11.58 |
| AQ-21 | 71+700 | Bıyıkali | Residential | Storage Area | 2,200 | 8.79 | 13.89 | 11.34 | 8.97 | 10.76 | 9.87 |
| AQ-22 | 69+400 | Yağcı | Residential | Motorway Route | 560 | 8.31 | 13.13 | 10.72 | 9.58 | 11.50 | 10.54 |
| AQ-23 | 69+500 | Yağcı | Residential | Storage Area | 450 | 8.87 | 14.02 | 11.45 | 9.30 | 11.35 | 10.33 |
| AQ-24 | 67+200 | Yağcı | Residential | Motorway Route | 330 | 8.62 | 13.61 | 11.12 | 10.27 | 12.53 | 11.40 |

| Air Quality Monitoring Station | Corresponding Motorway or Junction (km) | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | $SO_2$ (µg/m³) | | | $NO_2$ (µg/m³) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Mid Sep- Mid Oct 2022 | Mid Oct -Mid Nov 2022 | Avg. | Mid Sep- Mid Oct 2022 | Mid Oct -Mid Nov 2022 | Avg. |
| AQ-25 | 65+000 | Yağcı | Commercial | Motorway Route | 1,000 | 9.51 | 15.03 | 12.27 | 10.00 | 12.20 | 11.10 |
| AQ-26 | 63+700 | Kayı | Residential | Motorway Route | 270 | 9.26 | 14.64 | 11.95 | 9.52 | 11.61 | 10.57 |
| AQ-27 | 63+400 | Kayı | Residential | Motorway Route | 190 | 8.82 | 13.93 | 11.38 | 9.48 | 11.57 | 10.53 |
| AQ-28 | 61+000 | Kayı | Residential | Motorway Route | 20 | 8.78 | 13.88 | 11.33 | 10.17 | 12.41 | 11.29 |
| AQ-29 | 59+500 | Kayı | Residential | Motorway Route | 450 | 9.42 | 14.89 | 12.16 | 10.01 | 13.11 | 11.56 |
| AQ-30 | 60+100 | Kayı | Residential | Motorway Route | 600 | 9.27 | 14.65 | 11.96 | 9.82 | 12.86 | 11.34 |
| AQ-31 | 59+100 | Kayı | Residential | Motorway Route | 660 | 9.10 | 14.37 | 11.74 | 9.64 | 12.63 | 11.14 |
| AQ-32 | 56+900 | Köseilyas | Residential | Motorway Route | 250 | 8.93 | 14.11 | 11.52 | 9.05 | 11.86 | 10.46 |
| AQ-33 | 55+050 | Köseilyas | Residential | Motorway Route | 220 | 8.38 | 13.25 | 10.82 | 8.94 | 12.52 | 10.73 |
| AQ-34 | 54+900 | Köseilyas | Residential | Motorway Route | 150 | 8.28 | 13.09 | 10.69 | 8.73 | 12.22 | 10.48 |
| AQ-35 | 53+500 | Köseilyas | Commercial | Storage Area | 290 | 8.09 | 12.78 | 10.44 | 9.17 | 12.84 | 11.01 |
| AQ-36 | 53+200 | Köseilyas | Residential | Motorway Route | 1,000 | 8.50 | 13.42 | 10.96 | 9.06 | 13.59 | 11.33 |
| AQ-37 | 51+500 | Gazioğlu | Residential | Motorway Route | 50 | 8.39 | 13.26 | 10.83 | 9.43 | 14.15 | 11.79 |
| AQ-38 | 49+000 | Gazioğlu | Residential | Motorway Route | 960 | 8.74 | 13.80 | 11.27 | 9.64 | 14.46 | 12.05 |
| AQ-39 | 48+100 | Husunlu | Residential | Motorway Route | 560 | 8.93 | 14.11 | 11.52 | 9.90 | 14.85 | 12.38 |
| AQ-40 | 45+000 | Karaevli | Residential | Motorway Route | 900 | 9.17 | 14.49 | 11.83 | 10.09 | 15.14 | 12.62 |
| AQ-41 | 40+700 | Yenice | Residential | Motorway Route | 3,600 | 9.35 | 14.77 | 12.06 | 9.87 | 14.81 | 12.34 |
| AQ-42 | 37+700 | Yenice | Residential | Motorway Route | 660 | 9.14 | 14.45 | 11.80 | 8.88 | 13.32 | 11.10 |
| AQ-43 | 31+300 | Türkgücü | Residential | Borrow Pit | 820 | 8.23 | 13.00 | 10.62 | 9.34 | 13.95 | 11.65 |
| AQ-44 | 30+900 | Türkgücü | Residential | Motorway Route | 60 | 8.65 | 13.67 | 11.16 | 8.73 | 12.41 | 10.57 |
| AQ-45 | 31+000 | Çeşmeli | Residential | Storage Area | 960 | 8.09 | 12.78 | 10.44 | 8.51 | 11.20 | 9.86 |
| AQ-46 | 28+500 | Türkmenli | Residential | Storage Area | 850 | 7.88 | 12.46 | 10.17 | 7.77 | 9.87 | 8.82 |
| AQ-47 | 25+800 | Yakuplu | Residential | Motorway Route | 1,050 | 8.64 | 13.65 | 11.15 | 8.63 | 10.96 | 9.80 |
| AQ-48 | 25+000 | Yakuplu | Residential | Motorway Route | 1,080 | 9.77 | 14.43 | 12.10 | 7.94 | 10.08 | 9.01 |
| AQ-49 | 21+500 | Seymen | Residential | Storage Area | 850 | 8.62 | 13.62 | 11.12 | 8.02 | 10.19 | 9.11 |
| AQ-50 | 24+500 | Seymen | Residential | Motorway Route | 500 | 8.85 | 13.98 | 11.42 | 8.66 | 11.00 | 9.83 |
| AQ - 51 | 24+300 | Yakuplu | Residential | Motorway Route | 280 | 10.97 | 14.34 | 12.66 | 7.25 | 10.21 | 8.73 |
| AQ - 52 | 20+100 | Seymen | Residential | Motorway Route | 330 | 8.34 | 13.18 | 10.76 | 8.94 | 11.35 | 10.15 |
| AQ - 53 | 20+000 | Sultanköy | Residential | Motorway Route | 1,220 | 9.63 | 14.22 | 11.93 | 9.11 | 11.57 | 10.34 |
| AQ - 54 | 20+000 | Kamaradere | Residential | Motorway Route | 6,300 | 10.78 | 15.09 | 12.94 | 8.47 | 10.76 | 9.62 |
| AQ - 55 | 17+000 | Gümüşkaya | Residential | Storage Area | 1,450 | 9.22 | 12.91 | 11.07 | 9.35 | 11.87 | 10.61 |

| Air Quality Monitoring Station | Corresponding Motorway or Junction (km) | Village/ Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | $SO_2$ (µg/m³) | | | $NO_2$ (µg/m³) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Mid Sep- Mid Oct 2022 | Mid Oct -Mid Nov 2022 | Avg. | Mid Sep- Mid Oct 2022 | Mid Oct -Mid Nov 2022 | Avg. |
| AQ - 56 | 14+800 | Değirmenköy | Commercial | Motorway Route | 260 | 9.97 | 13.96 | 11.97 | 8.91 | 11.32 | 10.12 |
| AQ - 57 | 12+500 | Balaban | Commercial | Motorway Route | 140 | 8.54 | 11.96 | 10.25 | 9.46 | 10.96 | 10.21 |
| AQ - 58 | 12+500 | Fevzipaşa | Residential | Motorway Route | 650 | 9.97 | 13.96 | 11.97 | 8.53 | 9.98 | 9.26 |
| AQ - 59 | 9+800 | Balaban | Residential | Motorway Route | 90 | 7.99 | 14.23 | 11.11 | 7.74 | 9.06 | 8.40 |
| AQ - 60 | 10+000 | İsmetpaşa | Residential | Borrow Pit | 2,900 | 7.80 | 12.20 | 10.00 | 6.16 | 9.73 | 7.95 |
| AQ - 61 | 9+500 | Balaban | Residential | Borrow Pit | 1,050 | 8.20 | 13.04 | 10.62 | 6.78 | 10.71 | 8.75 |
| AQ - 62 | 6+500 | Çeltik | Residential | Motorway Route | ,000 | 8.10 | 12.96 | 10.53 | 5.95 | 9.40 | 7.68 |
| AQ - 63 | 4+000 | Çeltik | Residential | Motorway Route | 600 | 8.35 | 13.36 | 10.86 | 6.33 | 10.00 | 8.17 |
| AQ - 64 | 2+800 | Semizkumlar | Residential | Motorway Route | 1,160 | 7.80 | 14.83 | 11.32 | 7.15 | 11.30 | 9.23 |
| AQ - 65 | 2+400 | Yolçatı | Residential | Storage Area | 750 | 7.61 | 14.45 | 11.03 | 7.19 | 11.36 | 9.28 |
| AQ - 66 | 0+000 | Alipaşa | Commercial | Motorway Route | 1,110 | 7.33 | 13.93 | 10.63 | 7.77 | 12.28 | 10.03 |
| **Turkish Air Quality Standards[1]** | | | | | | **20.00** | | | **40.00** | | |
| **IFC Air Quality Standards[2]** | | | | | | **20.00** | | | **40.00** | | |
| **European Directives Air Quality Standards[3]** | | | | | | **20.00** | | | **40.00** | | |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)
[2] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)
[3] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air

### 6.1.9 Noise and Vibration

In order to determine the baseline noise and vibration levels in the Project AoI, environmental noise and vibration measurement studies were conducted at pre-determined locations along the planned motorway route in consideration with the associated facilities.

Within this regard, 66 representative background noise and vibration measurement locations mostly of the closest sensitive receptors to the planned Project components, were determined (Figure 60). Ambient noise measurement campaign was performed for a period of 48 hours in-between September 19$^{th}$ – October 1$^{st}$, 2022, at these locations in line with TS 9798 (ISO 1996–2) and TS 9315 (ISO 1996–1) standards. SC310 Type 1 sound level meter and Cesva CB006 Type 1 acoustic calibrator were used in the baseline noise measurement studies. In addition to the noise measurements, spot vibration measurements were performed at these 66 representative locations in line with the TS ISO 4866 standard.

Baseline noise measurement results are presented in Table 65 together with details of the representative measurement locations and the associated IFC guideline values and Turkish Regulatory noise limits. In accordance with the Table 65, almost all the baseline noise levels observed at the sensitive locations are below the limit values defined in Turkish Legislation as well as the IFC guideline values. However, night-time noise values measured at the locations N19 and N20, which are highlighted within the table, exceed the IFC night-time noise standard. For these locations, where IFC noise standard was exceeded, a 3 dBA increase in background noise levels as a result of the proposed Project's impact is allowed by the IFC EHS guideline.

Vibration measurement results are presented in Table 66 together with details of the representative measurement locations and the associated Turkish Regulatory limit values. It should be noted that according to the Regulation on Control of Environmental Noise, vibration limit values are determined in accordance with the type of operation/activity (i.e. blasting, railway/road operation, piling, etc.). However, these vibration limit values also differ in terms of vibration frequency (e.g. vibration originated by the blasting activities at mines are measured between 1-10 Hz frequency range, while vibrations due to road operations are measured at 1 Hz frequency). Interpretation of the vibration levels measured at the baseline locations should consider this definition given in the Regulation. Based on that, as it is seen in the Table 66, vibration measurement results at all receptors are below the regulatory limit values of 5 mm/s and 1.5 mm/s for construction and operation activities, respectively.

Noise and Vibration Measurements Result Report prepared by Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti. is presented in Appendix C.

**Table 65: Baseline Noise Measurement Results**

| Measurement Point | Measurement Location | | | | | | | | Measurement Day | Measurement Results (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Based on the periods of IFC[2] | | Based on the periods of Turkish Regulation[4] | | |
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | | Day (07:00 to 22:00) | Night (22:00 to 07:00) | Day (07:00 to 19:00) | Evening (19:00 to 23:00) | Night (23:00 to 07:00) |
| N1 | 506305 - 4525655 | 103+500 | Tekirdağ | Malkara | Ahievren | Residential | Motorway Route | 850 | Day 1 | 48.7 | 44.0 | 49.5 | 45.5 | 43.9 |
| | | | | | | | | | Day 2 | 47.1 | 39.7 | 48.3 | 41.7 | 39.8 |
| N2 | 507031 - 4525866 | 102+700 | Tekirdağ | Malkara | Ahievren | Commercial | Motorway Route | 680 | Day 1 | 47.5 | 40.6 | 48.6 | 42.5 | 40.0 |
| | | | | | | | | | Day 2 | 47.6 | 40.2 | 49.0 | 41.3 | 40.0 |
| N3 | 512427 - 4524843 | 98+500 | Tekirdağ | Malkara | Vakıfiğdemir | Residential | Borrow Pit | 3,000 | Day 1 | 50.9 | 42.9 | 51.9 | 46.3 | 43.0 |
| | | | | | | | | | Day 2 | 50.8 | 43.0 | 51.5 | 46.9 | 42.6 |
| N4 | 508330 - 4528503 | 100+000 | Tekirdağ | Malkara | Hereke | Residential | Motorway Route | 1,560 | Day 1 | 49.3 | 41.3 | 50.4 | 43.6 | 40.1 |
| | | | | | | | | | Day 2 | 44.9 | 39.5 | 46.6 | 38.7 | 39.5 |
| N5 | 511338 - 4529049 | 97+400 | Tekirdağ | Malkara | Yenice | Residential | Motorway Route | 600 | Day 1 | 50.5 | 43.4 | 51.3 | 46.6 | 42.7 |
| | | | | | | | | | Day 2 | 46.6 | 42.1 | 48.0 | 41.6 | 42.1 |
| N6 | 512467 - 4527409 | 96+600 | Tekirdağ | Malkara | Dereköy | Residential | Borrow Pit | 400 | Day 1 | 47.5 | 39.4 | 48.8 | 41.2 | 39.1 |
| | | | | | | | | | Day 2 | 47.1 | 40.9 | 48.7 | 40.7 | 41.1 |
| N7 | 514646 - 4529426 | 94+400 | Tekirdağ | Süleymanpaşa | Kınıklar | Residential | Storage Area | 260 | Day 1 | 52.4 | 42.0 | 54.9 | 41.7 | 41.6 |
| | | | | | | | | | Day 2 | 50.3 | 42.7 | 50.3 | 42.4 | 42.7 |
| N8 | 517259 - 4531150 | 91+000 | Tekirdağ | Süleymanpaşa | Akçahalil | Residential | Borrow Pit | 240 | Day 1 | 46.0 | 36.2 | 48.7 | 35.1 | 36.9 |
| | | | | | | | | | Day 2 | 47.3 | 39.0 | 48.1 | 42.6 | 38.7 |
| N9 | 518051 - 4529260 | 90+700 | Tekirdağ | Süleymanpaşa | Akçahalil | Residential | Motorway Route | 520 | Day 1 | 47.4 | 39.2 | 49.1 | 40.4 | 39.2 |
| | | | | | | | | | Day 2 | 47.0 | 39.7 | 48.2 | 41.8 | 39.5 |
| N10 | 520917 - 4531575 | 87+500 | Tekirdağ | Süleymanpaşa | Otmanlı | Commercial | Motorway Route | 980 | Day 1 | 51.1 | 44.5 | 52.2 | 46.0 | 41.7 |
| | | | | | | | | | Day 2 | 49.8 | 40.7 | 49.8 | 41.3 | 41.3 |
| N11 | 523263 - 4530892 | 85+250 | Tekirdağ | Süleymanpaşa | İnecik | Residential | Motorway Route | 40 | Day 1 | 48.5 | 43.9 | 49.3 | 45.4 | 43.9 |
| | | | | | | | | | Day 2 | 48.8 | 41.3 | 49.9 | 44.0 | 40.9 |
| N12 | 523420 - 4532270 | 84+600 | Tekirdağ | Süleymanpaşa | İnecik | Residential | Motorway Route | 1,250 | Day 1 | 51.4 | 40.6 | 54.4 | 39.4 | 41.1 |
| | | | | | | | | | Day 2 | 49.5 | 42.2 | 51.5 | 41.4 | 42.2 |
| N13 | 525119 - 4531796 | 83+100 | Tekirdağ | Süleymanpaşa | İnecik | Commercial | Motorway Route | 260 | Day 1 | 49.4 | 41.5 | 50.5 | 44.1 | 41.3 |
| | | | | | | | | | Day 2 | 43.6 | 42.4 | 44.0 | 42.1 | 42.7 |
| N14 | 526797 - 4533237 | 81+000 | Tekirdağ | Süleymanpaşa | Nusratfakı | Commercial | Motorway Route | 700 | Day 1 | 47.8 | 40.2 | 48.5 | 44.1 | 40.0 |
| | | | | | | | | | Day 2 | 48.7 | 40.7 | 48.7 | 47.1 | 40.7 |
| N15 | 527788 - 4532359 | 80+400 | Tekirdağ | Süleymanpaşa | Nusratfakı | Residential | Motorway Route | 460 | Day 1 | 49.1 | 41.2 | 50.6 | 42.6 | 40.9 |
| | | | | | | | | | Day 2 | 49.0 | 39.7 | 51.1 | 39.8 | 40.0 |
| N16 | 529595 - 4535479 | 77+100 | Tekirdağ | Süleymanpaşa | Güvençli | Residential | Motorway Route | 520 | Day 1 | 48.2 | 41.3 | 49.6 | 41.5 | 41.3 |
| | | | | | | | | | Day 2 | 47.3 | 41.5 | 48.0 | 44.0 | 41.6 |
| N17 | 526415 - 4540060 | 77+500 | Tekirdağ | Süleymanpaşa | Ferhadanlı | Residential | Storage Area | 4,600 | Day 1 | 53.3 | 41.9 | 56.5 | 40.4 | 42.6 |
| | | | | | | | | | Day 2 | 50.4 | 43.7 | 50.8 | 47.7 | 43.0 |
| N18 | 529124 - 4539988 | 74+500 | Tekirdağ | Süleymanpaşa | Hacıköy | Residential | Storage Area | 2,800 | Day 1 | 49.3 | 41.7 | 50.3 | 44.5 | 42.1 |
| | | | | | | | | | Day 2 | 48.2 | 42.6 | 48.8 | 45.5 | 41.9 |
| N19 | 531283 - 4536793 | 74+600 | Tekirdağ | Süleymanpaşa | Seymenli | Residential | Storage Area | 460 | Day 1 | 53.2 | 45.7 | 52.8 | 53.0 | 44.6 |

| Measurement Point | Measurement Location | | | | | | | | Measurement Day | Measurement Results (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Based on the periods of IFC[2] | | Based on the periods of Turkish Regulation[4] | | |
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | | Day (07:00 to 22:00) | Night (22:00 to 07:00) | Day (07:00 to 19:00) | Evening (19:00 to 23:00) | Night (23:00 to 07:00) |
| | | | | | | | | | Day 2 | 52.5 | 42.7 | 55.4 | 41.0 | 42.7 |
| N20 | 532721 - 4533447 | 75+500 | Tekirdağ | Süleymanpaşa | Karahisarlı | Residential | Motorway Route | 1,500 | Day 1 | 48.1 | 46.5 | 48.8 | 45.8 | 46.3 |
| | | | | | | | | | Day 2 | 47.7 | 39.3 | 50.1 | 38.0 | 40.1 |
| N21 | 531835 - 4540360 | 71+700 | Tekirdağ | Süleymanpaşa | Bıyıkali | Residential | Storage Area | 2,200 | Day 1 | 51.0 | 43.7 | 52.2 | 46.1 | 43.4 |
| | | | | | | | | | Day 2 | 49.1 | 41.8 | 49.8 | 45.6 | 41.2 |
| N22 | 536037 - 4539511 | 69+400 | Tekirdağ | Süleymanpaşa | Yağcı | Residential | Motorway Route | 560 | Day 1 | 48.4 | 40.6 | 49.9 | 41.8 | 40.2 |
| | | | | | | | | | Day 2 | 46.7 | 40.2 | 48.6 | 39.7 | 40.2 |
| N23 | 536542 - 4538859 | 69+500 | Tekirdağ | Süleymanpaşa | Yağcı | Residential | Storage Area | 450 | Day 1 | 49.3 | 43.5 | 49.9 | 46.1 | 43.5 |
| | | | | | | | | | Day 2 | 49.6 | 41.6 | 50.8 | 44.3 | 41.6 |
| N24 | 537822 - 4539890 | 67+200 | Tekirdağ | Süleymanpaşa | Karadeniz | Residential | Motorway Route | 330 | Day 1 | 49.3 | 43.6 | 50.0 | 46.0 | 43.6 |
| | | | | | | | | | Day 2 | 49.8 | 42.7 | 50.7 | 46.0 | 41.9 |
| N25 | 539409 - 4540872 | 65+000 | Tekirdağ | Süleymanpaşa | Yağcı | Commercial | Motorway Route | 1,000 | Day 1 | 46.8 | 39.6 | 48.0 | 41.7 | 39.6 |
| | | | | | | | | | Day 2 | 46.1 | 42.0 | 46.4 | 44.5 | 41.3 |
| N26 | 540433 - 4541503 | 63+700 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 270 | Day 1 | 48.1 | 41.2 | 50.0 | 40.6 | 41.3 |
| | | | | | | | | | Day 2 | 48.2 | 40.6 | 50.2 | 40.4 | 40.4 |
| N27 | 540972 - 4541731 | 63+400 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 190 | Day 1 | 49.8 | 42.0 | 50.9 | 44.5 | 41.5 |
| | | | | | | | | | Day 2 | 50.0 | 41.6 | 51.1 | 44.3 | 41.6 |
| N28 | 543153 - 4541309 | 61+000 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 20 | Day 1 | 47.8 | 39.8 | 49.2 | 41.5 | 39.4 |
| | | | | | | | | | Day 2 | 48.1 | 40.1 | 50.2 | 40.0 | 39.5 |
| N29 | 544195 - 4540054 | 59+500 | Tekirdağ | Süleymanpaşa | İstiklal | Residential | Motorway Route | 450 | Day 1 | 48.4 | 39.6 | 50.7 | 39.6 | 40.0 |
| | | | | | | | | | Day 2 | 49.9 | 41.2 | 51.0 | 44.5 | 41.4 |
| N30 | 544143 - 4541845 | 60+100 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 600 | Day 1 | 48.5 | 41.4 | 50.5 | 41.0 | 41.8 |
| | | | | | | | | | Day 2 | 50.4 | 42.2 | 52.7 | 41.6 | 42.6 |
| N31 | 545250 - 4541470 | 59+100 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 660 | Day 1 | 48.9 | 40.9 | 51.1 | 40.4 | 41.3 |
| | | | | | | | | | Day 2 | 49.8 | 41.6 | 51.4 | 43.0 | 41.8 |
| N32 | 546710 - 4539397 | 56+900 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 250 | Day 1 | 49.8 | 41.1 | 51.0 | 43.9 | 40.9 |
| | | | | | | | | | Day 2 | 51.2 | 42.4 | 52.5 | 45.1 | 42.0 |
| N33 | 548594 - 4539813 | 55+050 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 220 | Day 1 | 48.2 | 39.4 | 50.7 | 38.3 | 40.0 |
| | | | | | | | | | Day 2 | 48.7 | 42.1 | 49.7 | 43.8 | 41.7 |
| N34 | 548702 - 4539430 | 54+900 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 150 | Day 1 | 50.2 | 43.1 | 51.2 | 45.1 | 43.2 |
| | | | | | | | | | Day 2 | 49.3 | 41.3 | 50.7 | 43.4 | 41.5 |
| N35 | 549590 - 4541426 | 53+500 | Tekirdağ | Süleymanpaşa | Köseilyas | Commercial | Storage Area | 290 | Day 1 | 48.9 | 40.9 | 50.0 | 43.7 | 41.6 |
| | | | | | | | | | Day 2 | 49.9 | 42.3 | 49.9 | 41.8 | 42.3 |
| N36 | 550732 - 4538585 | 53+200 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 1,000 | Day 1 | 44.9 | 39.6 | 46.5 | 38.6 | 39.6 |
| | | | | | | | | | Day 2 | 50.4 | 42.1 | 52.6 | 42.0 | 42.5 |
| N37 | 552634 - 4538395 | 51+500 | Tekirdağ | Süleymanpaşa | Bahçelievler | Residential | Motorway Route | 50 | Day 1 | 49.0 | 40.3 | 50.0 | 43.4 | 40.0 |
| | | | | | | | | | Day 2 | 47.8 | 39.8 | 48.9 | 42.3 | 39.3 |
| N38 | 553205 - 4542665 | 49+000 | Tekirdağ | Süleymanpaşa | Gazioğlu | Residential | Motorway Route | 960 | Day 1 | 49.0 | 40.9 | 51.1 | 40.6 | 40.8 |

| Measurement Point | Measurement Location | | | | | | | | Measurement Day | Measurement Results (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Based on the periods of IFC[2] | | Based on the periods of Turkish Regulation[4] | | |
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | | Day (07:00 to 22:00) | Night (22:00 to 07:00) | Day (07:00 to 19:00) | Evening (19:00 to 23:00) | Night (23:00 to 07:00) |
| | | | | | | | | | Day 2 | 48.9 | 40.7 | 48.9 | 45.3 | 40.4 |
| N39 | 552392 - 4544143 | 48+100 | Tekirdağ | Süleymanpaşa | Husunlu | Residential | Motorway Route | 560 | Day 1 | 48.2 | 38.5 | 51.2 | 36.8 | 39.1 |
| | | | | | | | | | Day 2 | 49.6 | 43.1 | 50.3 | 46.1 | 42.7 |
| N40 | 555979 - 4543687 | 45+000 | Tekirdağ | Süleymanpaşa | Karaevli | Residential | Motorway Route | 900 | Day 1 | 48.7 | 40.6 | 51.1 | 39.5 | 41.2 |
| | | | | | | | | | Day 2 | 49.0 | 42.5 | 49.5 | 47.0 | 42.5 |
| N41 | 560252 - 4541819 | 40+700 | Tekirdağ | Çorlu | Yenice | Residential | Motorway Route | 3,600 | Day 1 | 49.5 | 40.8 | 52.0 | 39.7 | 41.6 |
| | | | | | | | | | Day 2 | 46.9 | 44.5 | 49.0 | 38.7 | 39.7 |
| N42 | 562553 - 4548347 | 37+700 | Tekirdağ | Çorlu | Yenice | Residential | Motorway Route | 660 | Day 1 | 48.8 | 40.8 | 50.0 | 43.2 | 40.3 |
| | | | | | | | | | Day 2 | 51.6 | 42.7 | 52.8 | 45.4 | 42.3 |
| N43 | 568345 - 4548605 | 31+300 | Tekirdağ | Çorlu | Türkgücü | Residential | Borrow Pit | 820 | Day 1 | 48.7 | 40.3 | 49.9 | 42.9 | 39.8 |
| | | | | | | | | | Day 2 | 50.1 | 42.0 | 51.4 | 44.1 | 41.6 |
| N44 | 569552 - 4546811 | 30+900 | Tekirdağ | Marmaraereğlisi | Çeşmeli | Residential | Motorway Route | 60 | Day 1 | 48.8 | 40.7 | 51.1 | 39.7 | 41.2 |
| | | | | | | | | | Day 2 | 48.7 | 42.5 | 50.4 | 41.5 | 42.9 |
| N45 | 570179 - 4544494 | 31+000 | Tekirdağ | Marmaraereğlisi | Çeşmeli | Residential | Storage Area | 960 | Day 1 | 50.2 | 40.8 | 53.0 | 39.2 | 41.5 |
| | | | | | | | | | Day 2 | 47.4 | 42.5 | 48.4 | 44.0 | 41.6 |
| N46 | 571562 - 4544339 | 28+500 | Tekirdağ | Marmaraereğlisi | Türkmenli | Residential | Storage Area | 850 | Day 1 | 47.2 | 41.1 | 49.2 | 39.7 | 42.0 |
| | | | | | | | | | Day 2 | 47.0 | 37.1 | 49.5 | 36.9 | 37.4 |
| N47 | 574486 - 4548016 | 25+800 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 1,050 | Day 1 | 47.2 | 39.2 | 48.8 | 40.5 | 39.6 |
| | | | | | | | | | Day 2 | 50.4 | 42.6 | 53.1 | 39.7 | 42.6 |
| N48 | 575241 - 4549476 | 25+000 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 1,080 | Day 1 | 51.7 | 41.9 | 54.5 | 40.6 | 42.5 |
| | | | | | | | | | Day 2 | 48.6 | 42.4 | 50.2 | 42.4 | 42.4 |
| N49 | 578864 - 4549330 | 21+500 | Tekirdağ | Çorlu | Seymen | Residential | Storage Area | 850 | Day 1 | 52.0 | 40.2 | 49.5 | 39.4 | 40.9 |
| | | | | | | | | | Day 2 | 51.7 | 43.9 | 53.7 | 44.2 | 44.5 |
| N50 | 576549 - 4551913 | 24+500 | Tekirdağ | Çorlu | Seymen | Residential | Motorway Route | 500 | Day 1 | 49.4 | 43.6 | 46.5 | 46.3 | 43.5 |
| | | | | | | | | | Day 2 | 47.9 | 40.6 | 50.0 | 39.7 | 41.3 |
| N51 | 576082 - 4547948 | 24+300 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 280 | Day 1 | 48.0 | 40.6 | 47.1 | 40.6 | 40.6 |
| | | | | | | | | | Day 2 | 50.0 | 42.5 | 50.9 | 46.1 | 42.4 |
| N52 | 580171 - 4547562 | 20+100 | Tekirdağ | Çorlu | Seymen | Residential | Motorway Route | 330 | Day 1 | 48.3 | 40.8 | 46.0 | 43.2 | 40.8 |
| | | | | | | | | | Day 2 | 47.0 | 42.1 | 48.6 | 41.3 | 42.3 |
| N53 | 580496 - 4543967 | 20+000 | Tekirdağ | Marmaraereğlisi | Sultanköy | Residential | Motorway Route | 1,220 | Day 1 | 46.4 | 40.4 | 44.3 | 42.0 | 40.0 |
| | | | | | | | | | Day 2 | 45.5 | 40.4 | 47.1 | 39.8 | 40.6 |
| N54 | 580799 - 4538260 | 20+000 | Tekirdağ | Marmaraereğlisi | Kamaradere | Residential | Motorway Route | 6,300 | Day 1 | 48.5 | 40.2 | 47.8 | 39.3 | 41.1 |
| | | | | | | | | | Day 2 | 50.9 | 42.4 | 52.0 | 45.6 | 42.2 |
| N55 | 584542 - 4543854 | 17+000 | İstanbul | Silivri | Gümüşkaya Merkez | Residential | Storage Area | 1,450 | Day 1 | 47.5 | 38.4 | 44.9 | 37.3 | 39.1 |
| | | | | | | | | | Day 2 | 46.7 | 39.1 | 48.6 | 39.5 | 39.5 |
| N56 | 585300 - 4548362 | 14+800 | İstanbul | Silivri | Fevzipaşa | Commercial | Motorway Route | 260 | Day 1 | 50.2 | 42.6 | 48.8 | 42.7 | 42.8 |
| | | | | | | | | | Day 2 | 51.2 | 44.0 | 51.8 | 48.2 | 43.6 |
| N57 | 588163 - 4548683 | 12+500 | İstanbul | Silivri | Balaban | Commercial | Motorway Route | 140 | Day 1 | 47.8 | 39.7 | 46.1 | 41.4 | 40.1 |
| | | | | | | | | | Day 2 | 47.5 | 41.8 | 49.6 | 39.3 | 42.2 |

| Measurement Point | Measurement Location | | | | | | | | Measurement Day | Measurement Results (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Based on the periods of IFC[2] | | Based on the periods of Turkish Regulation[4] | | |
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | | Day (07:00 to 22:00) | Night (22:00 to 07:00) | Day (07:00 to 19:00) | Evening (19:00 to 23:00) | Night (23:00 to 07:00) |
| N58 | 586483 - 4550069 | 12+500 | İstanbul | Silivri | İsmetpaşa | Residential | Motorway Route | 650 | Day 1 | 47.7 | 42.1 | 45.8 | 44.8 | 42.0 |
| | | | | | | | | | Day 2 | 47.7 | 40.6 | 49.6 | 40.4 | 41.1 |
| N59 | 588893 - 4551242 | 9+800 | İstanbul | Silivri | Balaban | Residential | Motorway Route | 90 | Day 1 | 49.8 | 39.8 | 46.8 | 38.9 | 40.6 |
| | | | | | | | | | Day 2 | 47.6 | 41.0 | 48.6 | 43.2 | 40.5 |
| N60 | 588815 - 4554539 | 10+000 | İstanbul | Silivri | İsmetpaşa | Residential | Borrow Pit | 2,900 | Day 1 | 45.8 | 38.1 | 45.3 | 35.6 | 38.8 |
| | | | | | | | | | Day 2 | 47.9 | 41.7 | 50.2 | 39.4 | 41.9 |
| N61 | 590046 - 4559119 | 9+500 | İstanbul | Silivri | Balaban | Residential | Borrow Pit | 1,050 | Day 1 | 51.0 | 44.0 | 46.6 | 48.4 | 43.4 |
| | | | | | | | | | Day 2 | 46.6 | 40.4 | 48.3 | 40.3 | 40.9 |
| N62 | 591887 - 4549969 | 6+500 | İstanbul | Silivri | Sancaktepe | Residential | Motorway Route | 1,000 | Day 1 | 50.1 | 41.8 | 48.4 | 44.8 | 41.5 |
| | | | | | | | | | Day 2 | 51.0 | 42.8 | 51.8 | 47.2 | 41.9 |
| N63 | 594478 - 4549785 | 4+000 | İstanbul | Silivri | Çeltik | Residential | Motorway Route | 600 | Day 1 | 48.1 | 41.0 | 45.2 | 43.9 | 40.8 |
| | | | | | | | | | Day 2 | 46.3 | 40.2 | 48.0 | 40.1 | 40.7 |
| N64 | 596088 - 4549563 | 2+800 | İstanbul | Silivri | Semizkumlar | Residential | Motorway Route | 1,160 | Day 1 | 53.3 | 44.0 | 49.8 | 42.8 | 45.0 |
| | | | | | | | | | Day 2 | 50.8 | 42.7 | 52.5 | 43.8 | 42.3 |
| N65 | 595540 - 4551889 | 2+400 | İstanbul | Silivri | Yolcatı | Residential | Storage Area | 750 | Day 1 | 51.7 | 43.1 | 49.9 | 45.6 | 43.4 |
| | | | | | | | | | Day 2 | 51.4 | 44.8 | 52.3 | 47.4 | 44.2 |
| N66 | 599082 - 4551542 | 000+000 | İstanbul | Silivri | Alipaşa | Commercial | Motorway Route | 1,110 | Day 3 | 48.1 | 40.4 | 46.5 | 42.5 | 40.1 |
| | | | | | | | | | Day 4 | 48.0 | 42.5 | 48.6 | 45.4 | 41.7 |
| IFC Noise Standards[1,2] | Industrial; commercial areas | | | | | | | | | **70** | **70** | - | - | - |
| | Residential; institutional; educational areas | | | | | | | | | **55** | **45** | - | - | - |
| Turkish Noise Limit Values[3,4] | Industrial facilities, transportation sources | | | | | | | | | - | - | **65** | **60** | **55** |
| | Businesses | | | | | | | | | - | - | **Background Noise Levels + 5** | | **Background Noise Levels + 3** |
| | In case of multiple businesses | | | | | | | | | - | - | **Background Noise Levels + 7** | | **Background Noise Levels + 5** |

**Notes:**

[1] IFC Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: Environmental - Noise Management;
[2] IFC Guidelines provide noise standards for two-time intervals in 24 hours: day (07:00 to 22:00), and night (22:00 to 07:00).
[3] Regulation on Control of Environmental Noise;
[4] Regulation on Control of Environmental Noise provides noise standards for three-time intervals in 24 hours: day (07:00 to 19:00), evening (19:00 to 23:00) and night (23:00 to 07:00).

**Table 66: Vibration Measurement Results**

| Measurement Point | Measurement Location | | | | | | | | Measurement Results (mm/s) – Construction Phase | | | Measurement Results (mm/s) – Operation Phase | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | X | Y | Z | X | Y | Z |
| N1 | 506305 - 4525655 | 103+500 | Tekirdağ | Malkara | Ahievren | Residential | Motorway Route | 850 | 1.46285 | 1.28200 | 1.78599 | 0.16091 | 0.14102 | 0.19646 |
| N2 | 507031 - 4525866 | 102+700 | Tekirdağ | Malkara | Ahievren | Commercial | Motorway Route | 680 | 1.33759 | 1.15059 | 1.83251 | 0.14714 | 0.12657 | 0.20158 |
| N3 | 512427 - 4524843 | 98+500 | Tekirdağ | Malkara | Vakıfiğdemir | Residential | Borrow Pit | 3,000 | 1.34391 | 1.18328 | 1.97390 | 0.12095 | 0.10650 | 0.17765 |
| N4 | 508330 - 4528503 | 100+000 | Tekirdağ | Malkara | Hereke | Residential | Motorway Route | 1,560 | 1.45422 | 1.34278 | 2.00092 | 0.13088 | 0.12085 | 0.18008 |
| N5 | 511338 - 4529049 | 97+400 | Tekirdağ | Malkara | Yenice | Residential | Motorway Route | 600 | 1.37495 | 1.29301 | 1.94560 | 0.12375 | 0.11637 | 0.17510 |
| N6 | 512467 - 4527409 | 96+600 | Tekirdağ | Malkara | Dereköy | Residential | Borrow Pit | 400 | 1.17830 | 1.17539 | 1.59915 | 0.12961 | 0.12929 | 0.17591 |
| N7 | 514646 - 4529426 | 94+400 | Tekirdağ | Süleymanpaşa | Kınıklar | Residential | Storage Area | 260 | 1.29453 | 1.17001 | 1.77314 | 0.14240 | 0.12870 | 0.19505 |
| N8 | 517259 - 4531150 | 91+000 | Tekirdağ | Süleymanpaşa | Akçahalil | Residential | Borrow Pit | 240 | 1.31074 | 1.20752 | 1.82753 | 0.14418 | 0.13283 | 0.20103 |
| N9 | 518051 - 4529260 | 90+700 | Tekirdağ | Süleymanpaşa | Akçahalil | Residential | Motorway Route | 520 | 1.26737 | 1.16913 | 1.81873 | 0.13941 | 0.12860 | 0.20006 |
| N10 | 520917 - 4531575 | 87+500 | Tekirdağ | Süleymanpaşa | Otmanlı | Commercial | Motorway Route | 980 | 1.33903 | 1.26249 | 1.73132 | 0.14729 | 0.13887 | 0.19045 |
| N11 | 523263 - 4530892 | 85+250 | Tekirdağ | Süleymanpaşa | İnecik | Residential | Motorway Route | 40 | 1.32270 | 1.30773 | 1.91741 | 0.14550 | 0.14385 | 0.21091 |
| N12 | 523420 - 4532270 | 84+600 | Tekirdağ | Süleymanpaşa | İnecik | Residential | Motorway Route | 1,250 | 1.41538 | 1.14243 | 1.83570 | 0.15569 | 0.12567 | 0.20193 |
| N13 | 525119 - 4531796 | 83+100 | Tekirdağ | Süleymanpaşa | İnecik | Commercial | Motorway Route | 260 | 1.32070 | 1.17210 | 2.03123 | 0.14528 | 0.10549 | 0.22343 |
| N14 | 526797 - 4533237 | 81+000 | Tekirdağ | Süleymanpaşa | Nusratfakı | Commercial | Motorway Route | 700 | 1.38682 | 1.20709 | 1.94054 | 0.15255 | 0.10864 | 0.21346 |
| N15 | 527788 - 4532359 | 80+400 | Tekirdağ | Süleymanpaşa | Nusratfakı | Residential | Motorway Route | 460 | 1.28770 | 1.12369 | 1.90675 | 0.14165 | 0.10113 | 0.20974 |
| N16 | 529595 - 4535479 | 77+100 | Tekirdağ | Süleymanpaşa | Güvençli | Residential | Motorway Route | 520 | 1.37079 | 1.15529 | 1.91751 | 0.15079 | 0.10398 | 0.21093 |
| N17 | 526415 - 4540060 | 77+500 | Tekirdağ | Süleymanpaşa | Ferhadanlı | Residential | Storage Area | 4,600 | 1.30076 | 1.11786 | 1.76048 | 0.14308 | 0.12296 | 0.19365 |
| N18 | 529124 - 4539988 | 74+500 | Tekirdağ | Süleymanpaşa | Hacıköy | Residential | Storage Area | 2,800 | 1.38863 | 1.20621 | 1.69913 | 0.15275 | 0.13268 | 0.18690 |
| N19 | 531283 - 4536793 | 74+600 | Tekirdağ | Süleymanpaşa | Seymenli | Residential | Storage Area | 460 | 1.44208 | 1.21886 | 1.82819 | 0.15863 | 0.13407 | 0.20110 |

| Measurement Point | Measurement Location | | | | | | | | Measurement Results (mm/s) – Construction Phase | | | Measurement Results (mm/s) – Operation Phase | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | X | Y | Z | X | Y | Z |
| N20 | 532721 - 4533447 | 75+500 | Tekirdağ | Süleymanpaşa | Karahisarlı | Residential | Motorway Route | 1,500 | 1.34998 | 1.13253 | 1.76531 | 0.14850 | 0.12458 | 0.19418 |
| N21 | 531835 - 4540360 | 71+700 | Tekirdağ | Süleymanpaşa | Bıyıkali | Residential | Storage Area | 2,200 | 1.41520 | 1.23572 | 1.87377 | 0.15567 | 0.11121 | 0.20612 |
| N22 | 536037 - 4539511 | 69+400 | Tekirdağ | Süleymanpaşa | Yağcı | Residential | Motorway Route | 560 | 1.35097 | 1.17359 | 1.66699 | 0.14861 | 0.12910 | 0.18337 |
| N23 | 536542 - 4538859 | 69+500 | Tekirdağ | Süleymanpaşa | Yağcı | Residential | Storage Area | 450 | 1.26721 | 1.08451 | 1.76168 | 0.13939 | 0.11930 | 0.19379 |
| N24 | 537822 - 4539890 | 67+200 | Tekirdağ | Süleymanpaşa | Karadeniz | Residential | Motorway Route | 330 | 1.34506 | 1.09071 | 1.82396 | 0.14796 | 0.11998 | 0.20064 |
| N25 | 539409 - 4540872 | 65+000 | Tekirdağ | Süleymanpaşa | Yağcı | Commercial | Motorway Route | 1,000 | 1.40736 | 1.22068 | 1.95354 | 0.15481 | 0.13427 | 0.21489 |
| N26 | 540433 - 4541503 | 63+700 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 270 | 1.36882 | 1.19337 | 1.88951 | 0.15057 | 0.13127 | 0.20785 |
| N27 | 540972 - 4541731 | 63+400 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 190 | 1.28556 | 1.16172 | 1.76701 | 0.14141 | 0.12779 | 0.19437 |
| N28 | 543153 - 4541309 | 61+000 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 20 | 1.39729 | 1.20315 | 1.79755 | 0.12576 | 0.10828 | 0.16178 |
| N29 | 544195 - 4540054 | 59+500 | Tekirdağ | Süleymanpaşa | İstiklal | Residential | Motorway Route | 450 | 1.83599 | 1.16310 | 1.87336 | 0.13836 | 0.11631 | 0.18734 |
| N30 | 544143 - 4541845 | 60+100 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 600 | 1.44171 | 1.21960 | 1.72245 | 0.12975 | 0.10976 | 0.15502 |
| N31 | 545250 - 4541470 | 59+100 | Tekirdağ | Süleymanpaşa | Kayı | Residential | Motorway Route | 660 | 1.39187 | 1.13506 | 1.84810 | 0.15311 | 0.12486 | 0.20329 |
| N32 | 546710 - 4539397 | 56+900 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 250 | 1.34409 | 1.24719 | 1.71353 | 0.14785 | 0.13719 | 0.18849 |
| N33 | 548594 - 4539813 | 55+050 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 220 | 1.41847 | 1.15397 | 1.69652 | 0.15603 | 0.12694 | 0.18662 |
| N34 | 548702 - 4539430 | 54+900 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 150 | 1.33671 | 1.24796 | 1.69814 | 0.14704 | 0.13728 | 0.18680 |
| N35 | 549590 - 4541426 | 53+500 | Tekirdağ | Süleymanpaşa | Köseilyas | Commercial | Storage Area | 290 | 1.25702 | 1.13621 | 1.78840 | 0.13827 | 0.12498 | 0.19672 |
| N36 | 550732 - 4538585 | 53+200 | Tekirdağ | Süleymanpaşa | Köseilyas | Residential | Motorway Route | 1,000 | 1.38081 | 1.07982 | 1.75028 | 0.15189 | 0.11878 | 0.19253 |
| N37 | 552634 - 4538395 | 51+500 | Tekirdağ | Süleymanpaşa | Bahçelievler | Residential | Motorway Route | 50 | 1.28212 | 1.07903 | 1.69843 | 0.14103 | 0.11869 | 0.18683 |
| N38 | 553205 - 4542665 | 49+000 | Tekirdağ | Süleymanpaşa | Gazioğlu | Residential | Motorway Route | 960 | 1.37826 | 1.20601 | 1.78555 | 0.15161 | 0.13266 | 0.19641 |

| Measurement Point | Measurement Location | | | | | | | | Measurement Results (mm/s) – Construction Phase | | | Measurement Results (mm/s) – Operation Phase | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | X | Y | Z | X | Y | Z |
| N39 | 552392 - 4544143 | 48+100 | Tekirdağ | Süleymanpaşa | Husunlu | Residential | Motorway Route | 560 | 1.37574 | 1.23633 | 1.96249 | 0.15133 | 0.13600 | 0.21587 |
| N40 | 555979 - 4543687 | 45+000 | Tekirdağ | Süleymanpaşa | Karaevli | Residential | Motorway Route | 900 | 1.38247 | 1.23901 | 1.88305 | 0.15207 | 0.13629 | 0.20713 |
| N41 | 560252 - 4541819 | 40+700 | Tekirdağ | Çorlu | Yenice | Residential | Motorway Route | 3,600 | 1.34020 | 1.22370 | 1.70918 | 0.14742 | 0.13461 | 0.18801 |
| N42 | 562553 - 4548347 | 37+700 | Tekirdağ | Çorlu | Yenice | Residential | Motorway Route | 660 | 1.25329 | 1.17851 | 1.70380 | 0.13786 | 0.12964 | 0.18742 |
| N43 | 568345 - 4548605 | 31+300 | Tekirdağ | Çorlu | Türkgücü | Residential | Borrow Pit | 820 | 1.28480 | 1.09629 | 1.76533 | 0.14133 | 0.12059 | 0.19419 |
| N44 | 569552 - 4546811 | 30+900 | Tekirdağ | Marmaraereğlisi | Çeşmeli | Residential | Motorway Route | 60 | 1.41999 | 1.16754 | 1.80564 | 0.15620 | 0.12843 | 0.19862 |
| N45 | 570179 - 4544494 | 31+000 | Tekirdağ | Marmaraereğlisi | Çeşmeli | Residential | Storage Area | 960 | 1.35265 | 1.26275 | 1.92915 | 0.12174 | 0.11365 | 0.17362 |
| N46 | 571562 - 4544339 | 28+500 | Tekirdağ | Marmaraereğlisi | Türkmenli | Residential | Storage Area | 850 | 1.32869 | 1.13617 | 1.96704 | 0.14616 | 0.12498 | 0.21637 |
| N47 | 574486 - 4548016 | 25+800 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 1,050 | 1.37545 | 1.27702 | 1.68237 | 0.15130 | 0.14047 | 0.18506 |
| N48 | 575241 - 4549476 | 25+000 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 1,080 | 1.37050 | 1.11832 | 1.76559 | 0.15075 | 0.12302 | 0.19421 |
| N49 | 578864 - 4549330 | 21+500 | Tekirdağ | Çorlu | Seymen | Residential | Storage Area | 850 | 1.41896 | 1.24354 | 1.73241 | 0.15609 | 0.13679 | 0.19057 |
| N50 | 576549 - 4551913 | 24+500 | Tekirdağ | Çorlu | Seymen | Residential | Motorway Route | 500 | 1.29747 | 1.11608 | 1.77754 | 0.14272 | 0.12277 | 0.19553 |
| N51 | 576082 - 4547948 | 24+300 | Tekirdağ | Marmaraereğlisi | Yakuplu | Residential | Motorway Route | 280 | 1.30359 | 1.14778 | 1.91469 | 0.14340 | 0.12626 | 0.21062 |
| N52 | 580171 - 4547562 | 20+100 | Tekirdağ | Çorlu | Seymen | Residential | Motorway Route | 330 | 1.41059 | 1.30250 | 1.94089 | 0.15517 | 0.14328 | 0.21350 |
| N53 | 580496 - 4543967 | 20+000 | Tekirdağ | Marmaraereğlisi | Sultanköy | Residential | Motorway Route | 1,220 | 1.33371 | 1.25422 | 1.88724 | 0.14671 | 0.13796 | 0.20760 |
| N54 | 580799 - 4538260 | 20+000 | Tekirdağ | Marmaraereğlisi | Kamaradere | Residential | Motorway Route | 6,300 | 1.14295 | 1.14013 | 1.55118 | 0.12572 | 0.12541 | 0.17063 |
| N55 | 584542 - 4543854 | 17+000 | İstanbul | Silivri | Gümüşkaya Merkez | Residential | Storage Area | 1,450 | 1.25570 | 1.13491 | 1.71995 | 0.13986 | 0.12884 | 0.19500 |
| N56 | 585300 - 4548362 | 14+800 | İstanbul | Silivri | Fevzipaşa | Commercial | Motorway Route | 260 | 1.27141 | 1.17130 | 1.77270 | 0.13523 | 0.12475 | 0.19406 |
| N57 | 588163 - 4548683 | 12+500 | İstanbul | Silivri | Balaban | Commercial | Motorway Route | 140 | 1.22935 | 1.13406 | 1.76416 | 0.14140 | 0.13332 | 0.18283 |

| Measurement Point | Measurement Location | | | | | | | | Measurement Results (mm/s) – Construction Phase | | | Measurement Results (mm/s) – Operation Phase | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Coordinates (X-Y) (UTM 50) | Corresponding Motorway km | Province | District | Village / Neighbourhood | Receptor Type | Nearest Project Component | Distance to Nearest Project Component (m) | X | Y | Z | X | Y | Z |
| N58 | 586483 - 4550069 | 12+500 | İstanbul | Silivri | İsmetpaşa | Residential | Motorway Route | 650 | 1.28547 | 1.21199 | 1.66207 | 0.13968 | 0.13810 | 0.20248 |
| N59 | 588893 - 4551242 | 9+800 | İstanbul | Silivri | Balaban | Residential | Motorway Route | 90 | 1.26980 | 1.25542 | 1.84071 | 0.13717 | 0.12396 | 0.18854 |
| N60 | 588815 - 4554539 | 10+000 | İstanbul | Silivri | İsmetpaşa | Residential | Borrow Pit | 2,900 | 1.24699 | 1.12687 | 1.71400 | 0.13717 | 0.12396 | 0.18854 |
| N61 | 590046 - 4559119 | 9+500 | İstanbul | Silivri | Balaban | Residential | Borrow Pit | 1,050 | 1.35537 | 1.16706 | 1.74363 | 0.14909 | 0.12838 | 0.19180 |
| N62 | 591887 - 4549969 | 6+500 | İstanbul | Silivri | Sancaktepe | Residential | Motorway Route | 1,000 | 1.34209 | 1.12820 | 1.81716 | 0.14763 | 0.12410 | 0.19989 |
| N63 | 594478 - 4549785 | 4+000 | İstanbul | Silivri | Çeltik | Residential | Motorway Route | 600 | 1.39846 | 1.18301 | 1.67078 | 0.15383 | 0.13013 | 0.18379 |
| N64 | 596088 - 4549563 | 2+800 | İstanbul | Silivri | Semizkumlar | Residential | Motorway Route | 1,160 | 1.35011 | 1.10101 | 1.79266 | 0.14851 | 0.12111 | 0.19719 |
| N65 | 595540 - 4551889 | 2+400 | İstanbul | Silivri | Yolcatı | Residential | Storage Area | 750 | 1.30377 | 1.20977 | 1.66213 | 0.14341 | 0.13307 | 0.18283 |
| N66 | 599082 - 4551542 | 0+000 | İstanbul | Silivri | Alipaşa | Commercial | Motorway Route | 1,110 | 1.35749 | 1.38720 | 1.60837 | 0.14932 | 0.15259 | 0.17692 |

| | | | |
|---|---|---|---|
| Turkish Vibration Limits in terms of Activities[1,2] | Vibration generated by blasting in mines, quarries and similar areas | Industrial buildings | **20** |
| | | Durable structures such as houses, brick and concrete | **5** |
| | Vibration generated by railway and road transportation vehicles, workplaces and industrial facilities | In Residences | **1.5** |
| | | In Offices | **3.5** |
| | Vibration generated by piling and similar vibration-generating operations in constructions, and by construction machinery | Residential Areas | **5** |
| | | Commercial Areas | **15** |

**Notes:**

[1] Regulation on Control of Environmental Noise;
[2] The Turkish limit values defined in Table-3, Table-4 and Table-5 of Annex-2 of Regulation on Control of Environmental Noise (Official Gazette numbered 32029, dated 30.11.2022)

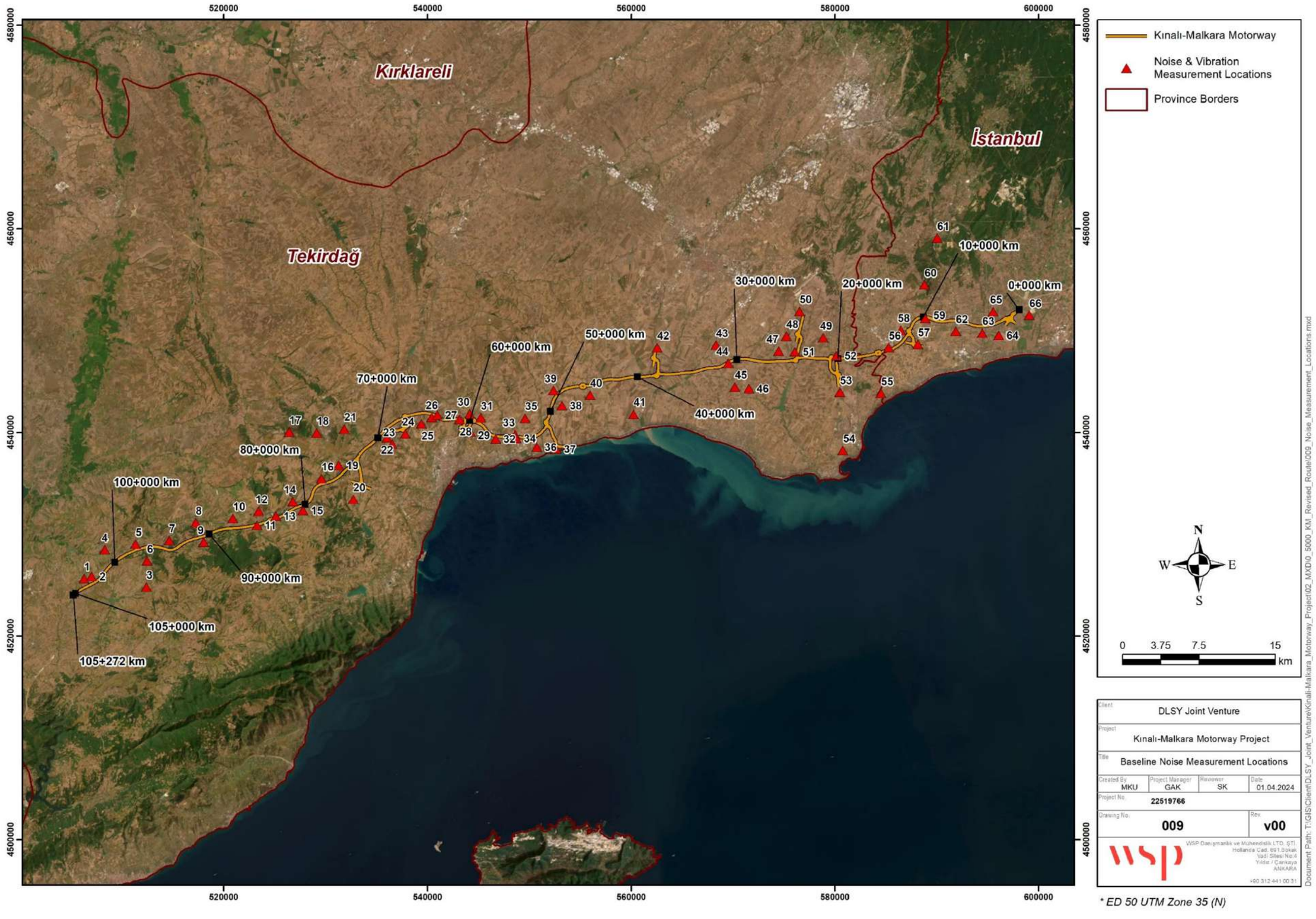



**Figure 60: Baseline Noise and Vibration Measurement Locations**

### 6.1.10 Traffic and Infrastructure

Existing roads along the Project route consisting of İstanbul and Tekirdağ provinces located in the 1st Regional Directorate of Highways are shown in the Figure 61. In total, there will be eight interchanges connected to the state roads[48] within the scope of the Project. The connection point of the interchange with the existing road and the traffic volume map, indicating the number and types of vehicles on the roads per day in 2021, is also given in Figure 62. It should be noted that there is only state road traffic volume information is available in Türkiye. Therefore, the traffic volume is estimated for the points where the intersections connect with the state roads, according to traffic volume map.

[48] State roads are the roads that are operated by the General Directorate of Highways and have publicly available traffic volume data.

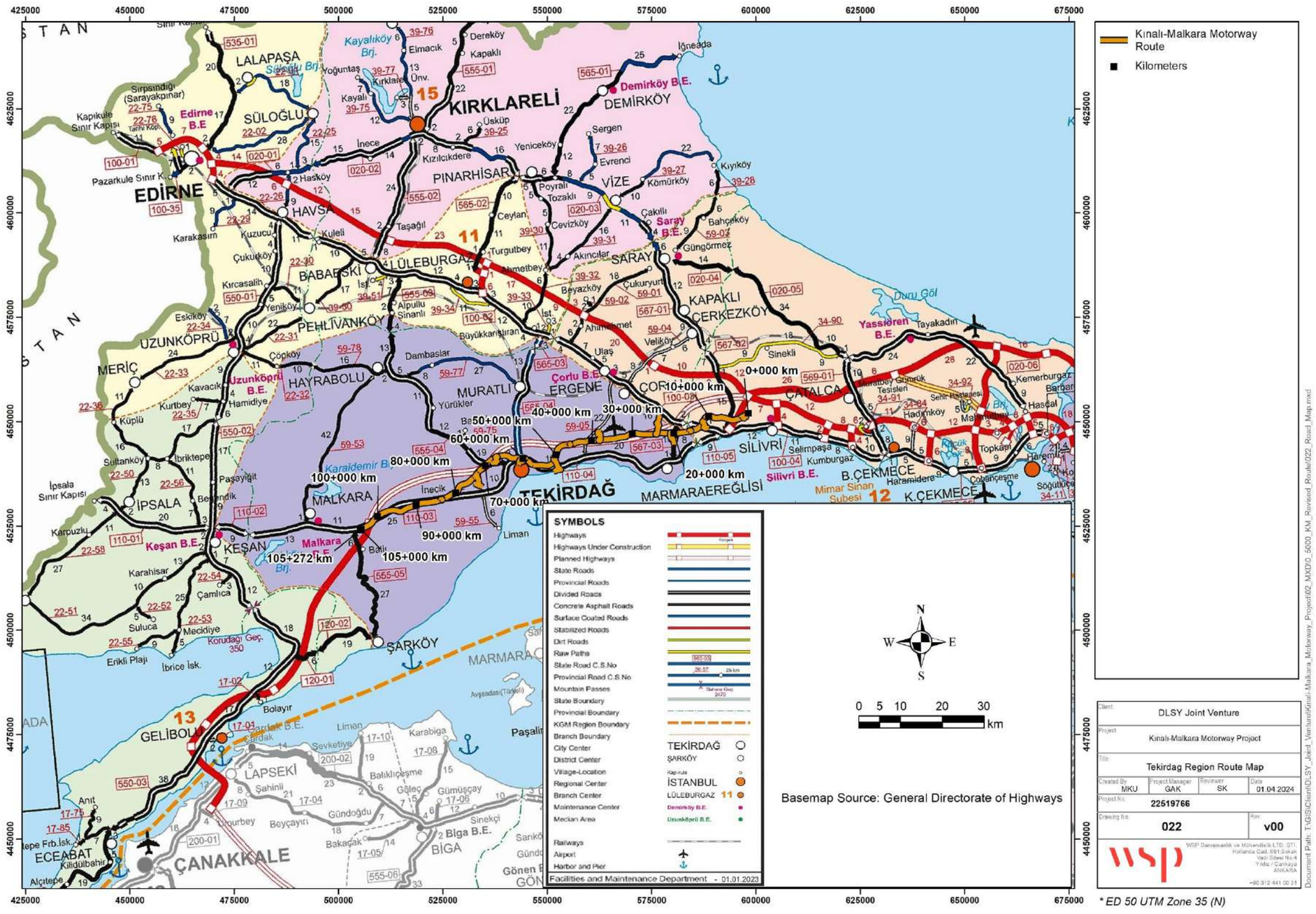



**Figure 61: Existing Roads under the 1st Regional Directorate of Highways[49]**

[49] (General Directorate of Highways, 2021)

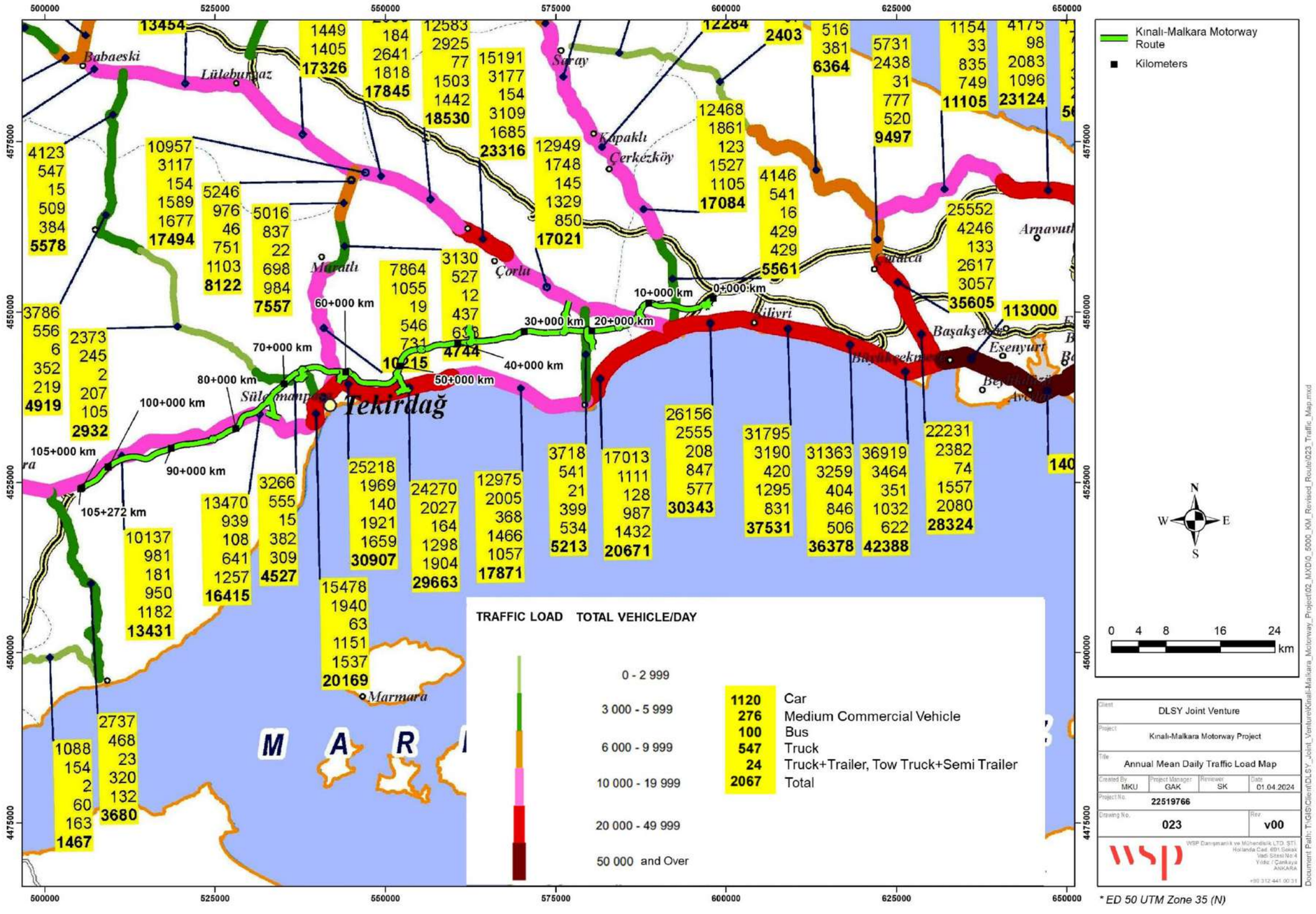



**Figure 62: Traffic Volume Map of the 14th Regional Directorate[50]**

[50] (General Directorate of Highways, 2021)

In order to estimate the existing traffic load, following assumptions have been made:

- The state roads to be connected to the Project with interchange, were determined.
- According to the traffic volume on the determined road, the traffic volume data, which was given closest to the connection point, was revealed.
- The closest points to the connection of the interchanges on the state road that presents the traffic volume were determined.

In order to evaluate the traffic load-increasing impact of the Project in the worst-case scenario, the daily number of vehicles is estimated as low as possible. According to traffic volume map as shown in Figure 62, the estimated traffic volume in the points where the intersections connect with the state roads are given in the Table 67 below.

**Table 67: The Estimated Traffic Volume**

| Kilometres connected to the Project | Interchange | Estimated Traffic Volume |
|---|---|---|
| 1+400 | Silivri Prison + Kınalı Interchange | 30,343 |
| 12+967 | Çanta Interchange-2 | 9,672 |
| 20+250 | Marmara Ereğlisi Interchange-2 | 5,213 |
| 24+000 | Çorlu Airport Interchange | 17,021 |
| 51+500 | Tekirdağ East Interchange-2 | 29,663 |
| 60+472 | Tekirdağ Interchange-2 | 30,907 |
| 66+600 | Hayrabolu Interchange-2 | 4,527 |
| 73+500 | Tekirdağ West Interchange-2 | 16,415 |

Some of the access roads to be used within the scope of the Project, have already exist. However, at this stage of the Project, the access roads to be used to provide transportation to all Project associated facilities and components are not certain yet. In case a need, some improvements and extensions will be carried out on existing roads.

In the existing access road, road construction is not expected but some extension or rehabilitation works might be performed in case of need. Detailed breakdown of the certain access roads in terms of corresponding Project component and kilometer regarding to the planned Project route is given in Table 68. The Project layout indicating the access roads is also given in Figure 63.

**Table 68: Access Roads to be used during the Construction Phase**

| Project Components/Associated Facilities | Connection Km with Project Route |
|---|---|
| Storage Area-1 (Çeltik) | 2+500 |
| Storage Area-2 (Çanta)<br>Borrow Pit-1 (KGM)<br>Danamandıra Quarry | 5+250 |
| Storage Area-3 (Gümüşkaya) | 17+550 |
| Storage Area-4 (Çorlu) | 20+200 |
| Storage Area-5 (Türkmenli) | 26+600<br>29+500 |
| Borrow Pit-2 (Türkgücü)<br>Storage Area-6 (Türkgücü) | 30+400 |

| Project Components/Associated Facilities | Connection Km with Project Route |
|---|---|
| Storage Area-7 (Hüsünlü) | 47+550<br>48+400 |
| Camp Site<br>Concrete Batching Plant-2 | 48+400 |
| Storage Area-8 (Köseilyas) | 53+400 |
| Storage Area-9 (Yenişehir)<br>Muratlı Basalt Quarry | 60+500 |
| Storage Area-10 (Hayrabolu)<br>Osmanli Basalt Quarry | 67+950 |
| Storage Area-12 (Seymenli) | 75+800 |
| Storage Area-13 (Nusratfakı) | 80+500 |
| Storage Area-14 (İnecik)<br>Borrow Pit-3 (İnecik)<br>Tepeköy Rock Quarry | 82+950 |
| Storage Area-14 (İnecik)<br>Borrow Pit-3 (İnecik)<br>Borrow Pit-4 (İnecik)<br>Tepeköy Rock Quarry | 85+000 |
| Borrow Pit-5 (Mahramlar) | 91+400 |
| Storage Area-15 (Kınıklar) | 93+800 |
| Dereköy Quarry | 96+750 |

The land traffic in the construction phase will be generated by the machinery, equipment, material, and staff to be transported to the Project construction sites. During the construction phase an increase in construction machinery especially of trucks is expected.

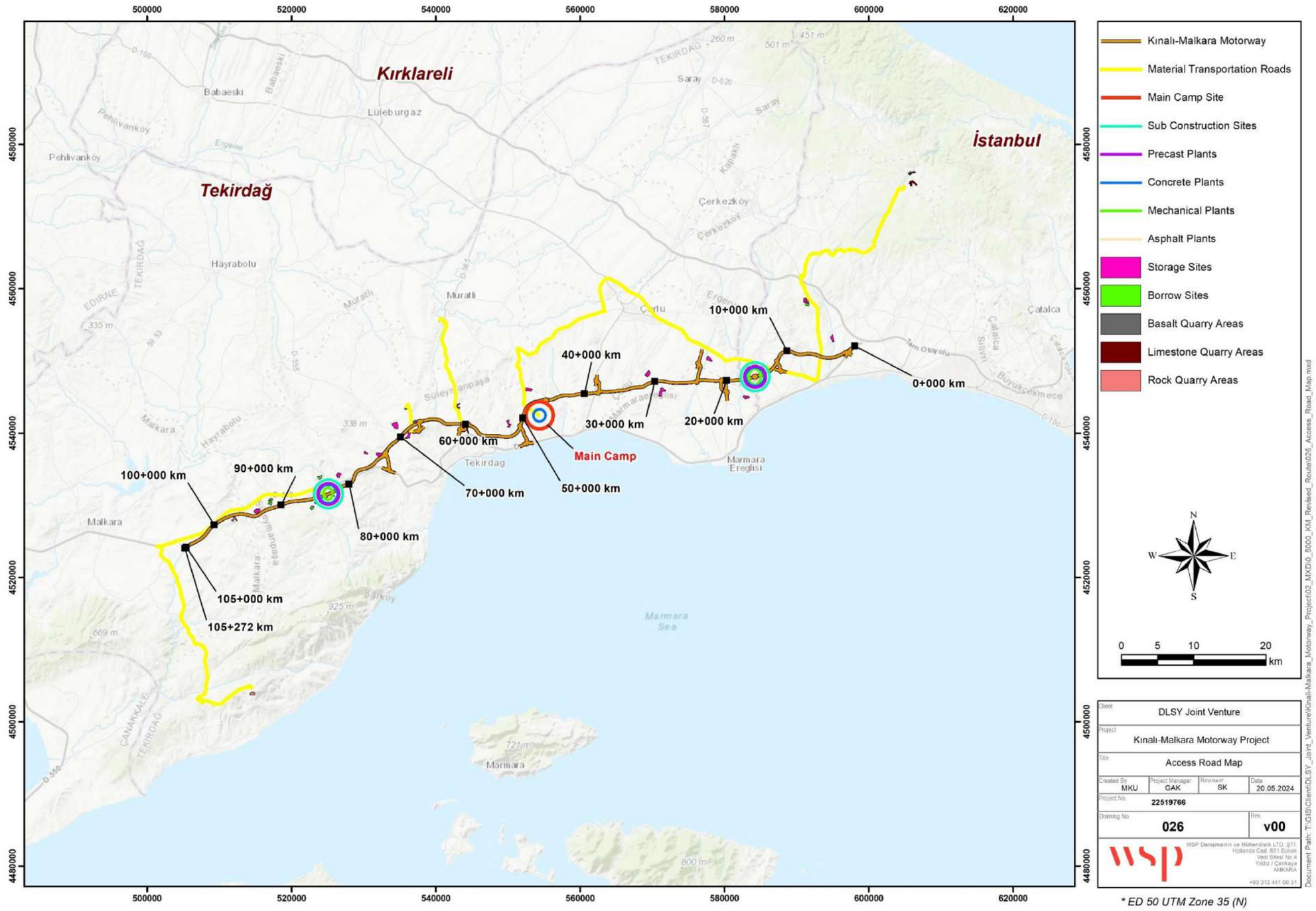



**Figure 63: Access Roads along the Project Route**

## 6.2 Biological Components

### 6.2.1 Study Area for Biodiversity

Two types of study areas were identified for the baseline assessment. A wider Regional Study Area was identified and considered during the initial literature review in order to assess the species and habitats potentially occurring, while a Local Study Area more focused on the Project was identified for future detailed field studies and mapping. These areas are described below.

#### *6.2.1.1 Regional Study Area (RSA)*

The biodiversity Regional Study Area (RSA) is a broad area containing a geographically distinct assemblage of species, natural communities, and environmental conditions. The RSA is defined in order to assess, based on literature review, the species and habitats potentially occurring within and in the vicinity of the Project.

For this Project a terrestrial RSA and a freshwater RSA have been identified based on bio-geographic characteristics (Figure 64; see section 6.2.3.1 for more details):

- a terrestrial RSA corresponding to the **"PA0404 - Balkan mixed forests"** terrestrial ecoregion which is part of the broader "Temperate Broadleaf & Mixed Forests" category (Olson *et al*., 2001[51]);
- a freshwater RSA corresponding to two main river basins, the **Meriç-Ergene Basin and Marmara Basin**, which are part of the "**423 - Thrace**" freshwater ecoregion, and a major sub-basin, the Karaçay Sub-basin, which fells within the "**418 - Dniester - Lower Danube**" freshwater ecoregion (Freshwater Ecoregions of the World - http://www.feow.org/[52]).

[51] Olson, David M., *et al*. "Terrestrial Ecoregions of the World: A New Map of Life on Earth. A new global map of terrestrial ecoregions provides an innovative tool for conserving biodiversity." BioScience 51.11 (2001): 933-938.

[52] Abell, Robin, *et al*. "Freshwater ecoregions of the world: a new map of biogeographic units for freshwater biodiversity conservation." BioScience 58.5 (2008): 403-414.




**Figure 64: Terrestrial and freshwater Regional Study Areas (RSA)**

#### 6.2.1.2 Local Study Area (LSA)

The Local Study Areas (LSA) was identified for terrestrial and freshwater habitats to include all the Project components, including associated facilities, both permanent (switchyard and stations) and temporary (camp sites, storage areas, borrow pits, limestone quarries, concrete plants, sub-construction sites), as well as the expected Area of Influence of the Project (i.e., the area beyond which no detectable effects on biodiversity are expected). The Local Study Area was also defined to include an appropriate ecological unit to support the design of a Biodiversity Management Plan.

The LSA is part of the wider RSA and, since there are no clear physical boundaries, it was designed as a 500 m buffer around the planned route of the motorway, the footprint of all associated facilities (borrow pits, limestone quarries, camp sites, storage areas, sub-construction sites, concrete plants) and all access roads to associated facilities. The designed LSA extends for approximately 208 km within Tekirdağ Province in the north-western part of Türkiye. The LSA is located at elevations between 19 m and 675 m above sea level.

The Biodiversity LSA is illustrated in Figure 65 below.

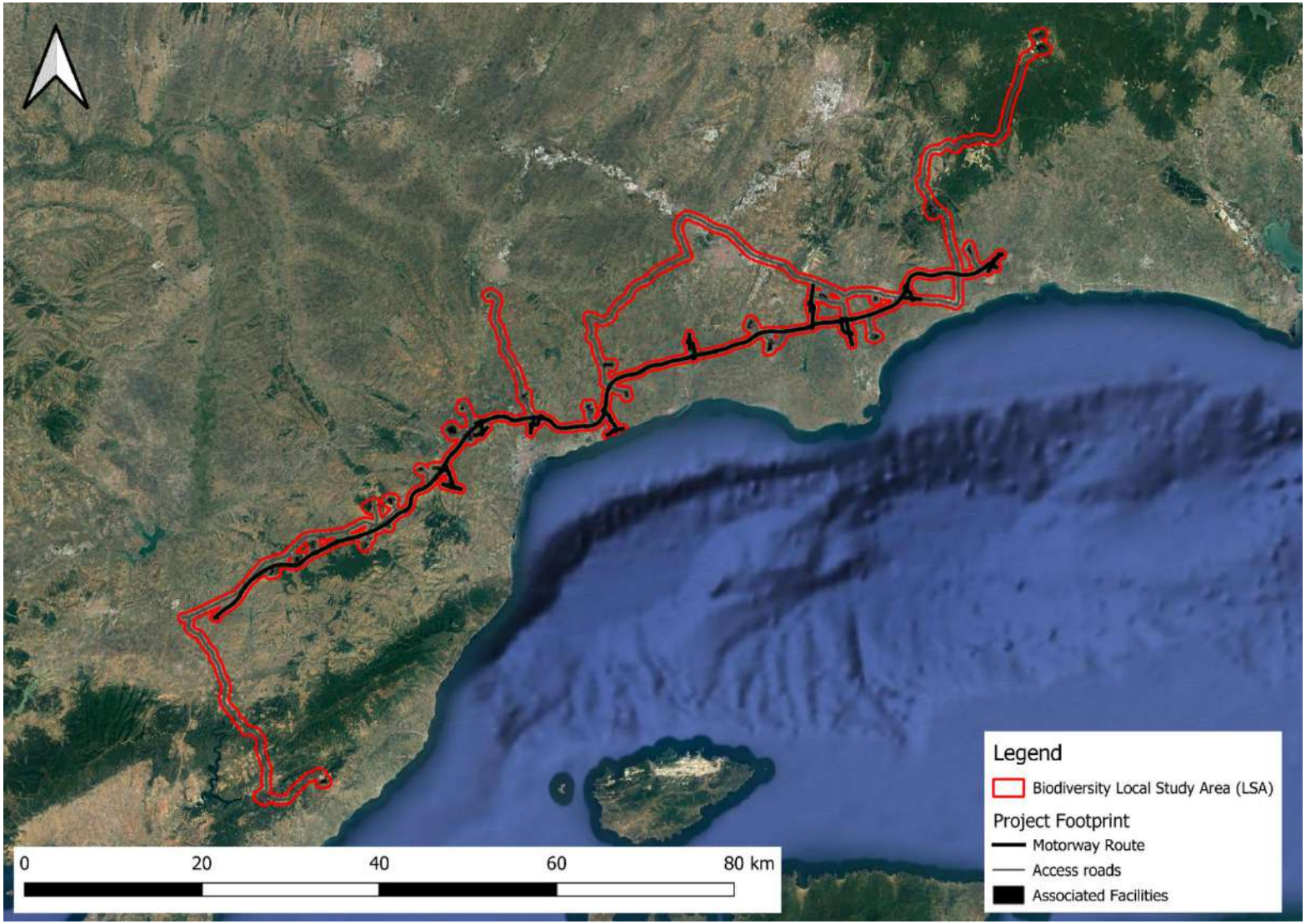



**Figure 65: Biodiversity Local Study Area (LSA)**

### 6.2.2 Methodology

#### *6.2.2.1 Desktop Studies*

Literature review focused on the terrestrial and freshwater RSAs in order to document available data on terrestrial and freshwater species and habitats of conservation concern, including local and global distribution, conservation status, ecological niche, phenology, life cycle etc. Scientific literature and official web sites were considered in order to give an overview of the biodiversity sensitive elements potentially present in the area. No data from previous reports were available.

The literature review and web sources considered are chronologically listed below.

- **Scientific publications and other official publications used for desktop analysis**


  - Abell, R. et al. "Freshwater ecoregions of the world: a new map of biogeographic units for freshwater biodiversity conservation." BioScience 58.5 (2008): 403-414.
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  - Olson, D. M., Dinerstein, E., Wikramanayake, E. D., Burgess, N. D., Powell, G. V. N., Underwood, E. C., D'Amico, J. A., Itoua, I., Strand, H. E., Morrison, J. C., Loucks, C. J., Allnutt, T. F., Ricketts, T. H., Kura, Y., Lamoreux, J. F., Wettengel, W. W., Hedao, P., Kassem, K. R. 2001. Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11):933-938
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  - Ekim, T. *et al*. (2000). Turkiye Bitkileri Kirmizi Kitabı (Red Data Book of Turkish Plants). Turkiye Tabiatını Koruma Dernegi. Yayın No:18.
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- Varol, Memet, and Cem Tokatlı. "Evaluation of the water quality of a highly polluted stream with water quality indices and health risk assessment methods." *Chemosphere* 311 (2023): 137096.
- Wettengel, W. W., Hedao, P., Kassem, K. R. (2001) Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11):933-938.
- Wilson, J. B., Peet, R. K., Dengler, J., & Pärtel, M. (2012). Plant species richness: The world records. Journal of Vegetation Science, 23(4), 796–802.


- **Web sources:**


  - Birdlife International (http://www.birdlife.org/)
  - Doğa dernegi (https://www.dogadernegi.org/)
  - European Environment Agency (https://eunis.eea.europa.eu/index.jsp)
  - Freshwater Ecoregions of the World (http://www.feow.org/)
  - Invasive Species specialist Group (IUCN) http://issg.org/
  - IUCN World Database on Protected Areas (https://www.iucn.org/theme/protected-areas/our-work/parks-achieving-quality-and-effectiveness/world-database-protected-areas-wdpa)
  - IUCN Red List of Threatened Species (https://www.iucnredlist.org)
  - World Database of Key Biodiversity Areas (http://www.keybiodiversityareas.org/site/mapsearch)
  - World Database on Protected Areas (http://www.protectedplanet.net/)
  - WWF database for ecoregions and biomes (https://www.worldwildlife.org/)
  - Turkish Plants Data Service (TÜBİVES) - Version 2.0 BETA (http://194.27.225.161/yasin/tubives/index.php)
  - Bizimbitkiller.org.tr, Nezahat Gokyigit Botanical Garden Service (https://bizimbitkiler.org.tr/yeni/demos/technical/)


#### *6.2.2.2 Field Studies*

Field surveys were conducted in June 2022 according to the work instructions drawn up following the gap analysis and literature review in the scoping report with the objective of describing the status of the biodiversity as well as habitats within the LSA. Thus, the field studies were conducted on the following components:

- terrestrial flora and habitats;
- terrestrial fauna, targeting in particular the European Souslik (*Spermophilus citellus,* EN);
- freshwater fauna (fishes).

A second freshwater survey campaign was conducted in January 2023 according to the provided work instructions. For each of the above listed components the field methodology is described below.

#### 6.2.2.2.1 Terrestrial Flora and Habitat Survey

Field studies on the terrestrial flora and habitats were carried out at 15 different sampling points (SPs) within the LSA along the Kınalı-Malkara Motorway route on the 22nd and the 23rd of June 2022 by the expert botanist Prof. Hayri Duman of University of Gazi (Faculty of Science, Dpt. Biology).

Prof. Hayri Duman is a prominent botanist renowned for his extensive research on Turkish flora. With decades of experience in plant taxonomy and ecology and more than 110 scientific publications, he has made significant contributions to the understanding of plant diversity in Turkey. His work includes the identification and classification of numerous plant species, many of which are endemic to the region. Prof. Duman has published extensively in academic journals, sharing his findings on the ecological significance of Turkey's rich botanical heritage. His expertise not only enhances the scientific community's knowledge but also informs conservation efforts aimed at preserving the unique plant diversity of Turkey. The professor has extensively worked in the areas covered by the field study, and his prior experience has proven invaluable in identifying areas of particular interest for verifying the presence of sensitive terrestrial flora species and in assessing the potential impacts of the Project on species and habitats. The expert is one of the authors of the Red Data Book of Turkish Plants. This book classifies the rare and endemic plant species found in Turkey according to their IUCN categories and includes a local IUCN list. Additionally, the expert has conducted studies on species of the genus Cirsium, which trigger critical habitat considerations within the scope of the project (Duman et al., 2017[53]). Finally, the expert has contributed to numerous international projects funded by international financial institutions.

The experience of Prof. Duman in flora species diversity and taxonomy is attested by the numerous scientific publications describing new identified species, belonging to several taxonomic families, including Caryophyllaceae (Aytaç & Duman, 2004[54]), Lamiaceae (Duman *et al.*, 1995[55]; Duman & Dirmenci, 2017[56], Duman *et al.*, 2023[57]), Apiaceae (Dogan Guner & Duman, 2013[58]; Aytaç & Duman, 2016 [59], Sağıroğlu & Duman, 2023[60]), Asteraceae (Duman *et al.*, 2021[61], Karaman *et al.*, 2022[62], Teksen *et al.*, 2022[63]), Fabaceae

[53] Duman, Hayri; Tugay, Osman; Dirmenci, Tuncay; And Ertuğrul, Kuddisi (2017) "A new species of Cirsium sect. Epitrachys (Asteraceae: Cardueae)from the south of Turkey," Turkish Journal of Botany: Vol. 41: No. 4, Article 6. DOI: 10.3906/bot-1612-33

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[55] Duman, H., Aytec, Z., Ekici, M., Karaveliogullari, E., Dönmez, A., Duran, A. (1995). Three new species (Labiatae) from Turkey. 5. 221-228.

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[61] Duman, H., Uzunhisarcıklı, M., Bahadır, Y. (2021). A new species of Centaurea (Asteraceae) from northern Turkey. Nordic Journal of Botany. 39. 10.1111/njb.03244.

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(Duman *et al.*, 2020[64], Karaman *et al.*, 2022[65]), Ranunculaceae (Karaman *et al.*, 2021[66]), Scrophulariaceae (Duman *et al.*, 2020[67]), Amaryllidaceae (Ekşi Bona & Duman, 2020[68]), Asparagaceae (Eker et al., 2020[69]), Iridaceae (Sağıroğlu *et al.*, 2022[70]). Prof. Duman is also one of the authors of the Red Data Book of Turkish plants (Ekim *et al.*, 2000[71]), which in Türkiye still represents the most recent official reference for the threat assessment of flora species at national level according to IUCN Red List criteria. This publication represents an important recognition in the field of plant biodiversity conservation and environmental impact assessment. A recent publication (Duman *et al.*, 2024[72]) proves the experience gained through the participation to a large number of conservation and offsetting projects, in particular for what regards the strongly threatened steppe ecosystems.

Each sampling point of the field survey conducted by Prof. Duman in June 2022 was selected to include different environmental conditions, aiming at gaining deep understanding of the habitats and of the flora species present in the LSA and at identifying critical habitats or flora species of conservation concern. During the field work, a 500 $m^2$ minimum area was examined in detail for each station to directly identify flora species and habitats, also collecting field notes, GPS coordinates (WGS84 UTM Zone 35N) and photographic documentation.

A list of flora species observed and identified was compiled at each sampling point. Species were evaluated based on the threat status and endemism according to the information provided by the International Union for Conservation of Nature (IUCN). In the absence of a Global IUCN assessment (e.g. Not Evaluated NE, or Data Deficient DD), the species status was defined by taking into account the threat categories provided in the local assessments (e.g. Red Data Book for Turkish Plants) re-evaluated by the local expert (Prof. Hayri Duman) based on the latest available information on the species distribution and IUCN 2001 criteria. Quantitative information (e.g., number of individuals for single populations) were also collected for species of conservation concern, while for all the other species just abundance data were collected. The main habitat types were described and categorized according to the EUNIS classification system, with regards to the definition of Natural Habitats and Modified Habitats (IFC PS6, 2019).

The 15 SPs with their relative coordinates and are given in Table 69, while their location is shown in Figure 66.

**Table 69: Terrestrial flora and habitats sampling point coordinates within the LSA**

| Field ID | Coordinates (Meters, WGS84 UTM Zone 35N) | | Survey Date |
|---|---|---|---|
| | Longitude | Latitude | |
| SP01 | 592018 | 4550471 | 23/06/2022 |

[64] Duman, H., Aytaç, Z., Özbek, F. (2020). Astragalus aybarsii a new species of sect. Onobrychoidei DC. (Fabaceae) from Turkey. Doga, Turkish Journal of Botany. 44. 661-669. 10.3906/bot-2006-8.

[65] Karaman, S., Duman, H., Ates, M. (2022). Astragalus oksutdagensis (Fabaceae), a new species from Turkey. Nordic Journal of Botany. 2022. 10.1111/njb.03237.

[66] Karaman, S., Teksen, M., Duman, H. (2021). Ranunculus aydogdui (Ranunculaceae), a new species from Turkey. Nordic Journal of Botany. 39. 10.1111/njb.02980.

[67] Duman, H., Uzunhisarcıklı, M., Özbek, F. (2020). A new species of Verbascum (Scrophulariacae) from western Turkey. Botany Letters. 167. 1-8. 10.1080/23818107.2020.1796782.

[68] Ekşi Bona, G., Duman, H. (2020). Allium shahinii: a new species of A. sect. Scorodon (Amaryllidaceae) from Turkey. Phytotaxa. 461. 195-203. 10.11646/phytotaxa.461.3.6.

[69] Eker, İ., Duman, H., Yıldırım, H. (2020). Muscari muglaensis (Asparagaceae, Scilloideae), a new species from southwestern Anatolia. Phytotaxa. 475. 267-278. 10.11646/phytotaxa.475.4.4.

[70] Sağıroğlu, M., Teksen, M., Duman, H., Karaman, S., Çakir E.C.E. (2022). Gladiolus alanyensis (Iridaceae), a new species from southern Turkey in the eastern Mediterranean basin. Phytotaxa. 559. 145-156. 10.11646/phytotaxa.559.2.3.

[71] Ekim, T., Koyunce, M., Vural, H., Duman, H., Aytaç, Z., Adıguzel, N. (2000). The red book of Turkish plants, Turkish Association for the Conservation of Nature TTKD and Van Yuzuncu Yil Unv. Ankara.

[72] Duman, H., Doğan, M., Atlı, Ö., Celep, F. (2024). Ex Situ and In Situ Conservation Approaches in Species-Rich Anatolian Steppe Ecosystem: A Case Study from Ankara, Türkiye. Ecologies. 5. 664-678. 10.3390/ecologies5040039.

| Field ID | Coordinates (Meters, WGS84 UTM Zone 35N) | | Survey Date |
|---|---|---|---|
| | Longitude | Latitude | |
| SP02 | 576551 | 4550908 | 23/06/2022 |
| SP03 | 570025 | 4547038 | 23/06/2022 |
| SP04 | 565026 | 4545026 | 23/06/2022 |
| SP05 | 543196 | 4540937 | 23/06/2022 |
| SP06 | 539085 | 4541769 | 23/06/2022 |
| SP07 | 536016 | 4540121 | 23/06/2022 |
| SP08 | 531704 | 4536190 | 23/06/2022 |
| SP09 | 529693 | 4534994 | 23/06/2022 |
| SP10 | 519680 | 4530560 | 23/06/2022 |
| SP11 | 515435 | 4528896 | 23/06/2022 |
| SP12 | 513411 | 4528461 | 23/06/2022 |
| SP13 | 535411 | 4539224 | 23/06/2022 |
| SP14 | 575317 | 4549219 | 23/06/2022 |
| SP15 | 510563 | 4527879 | 23/06/2022 |

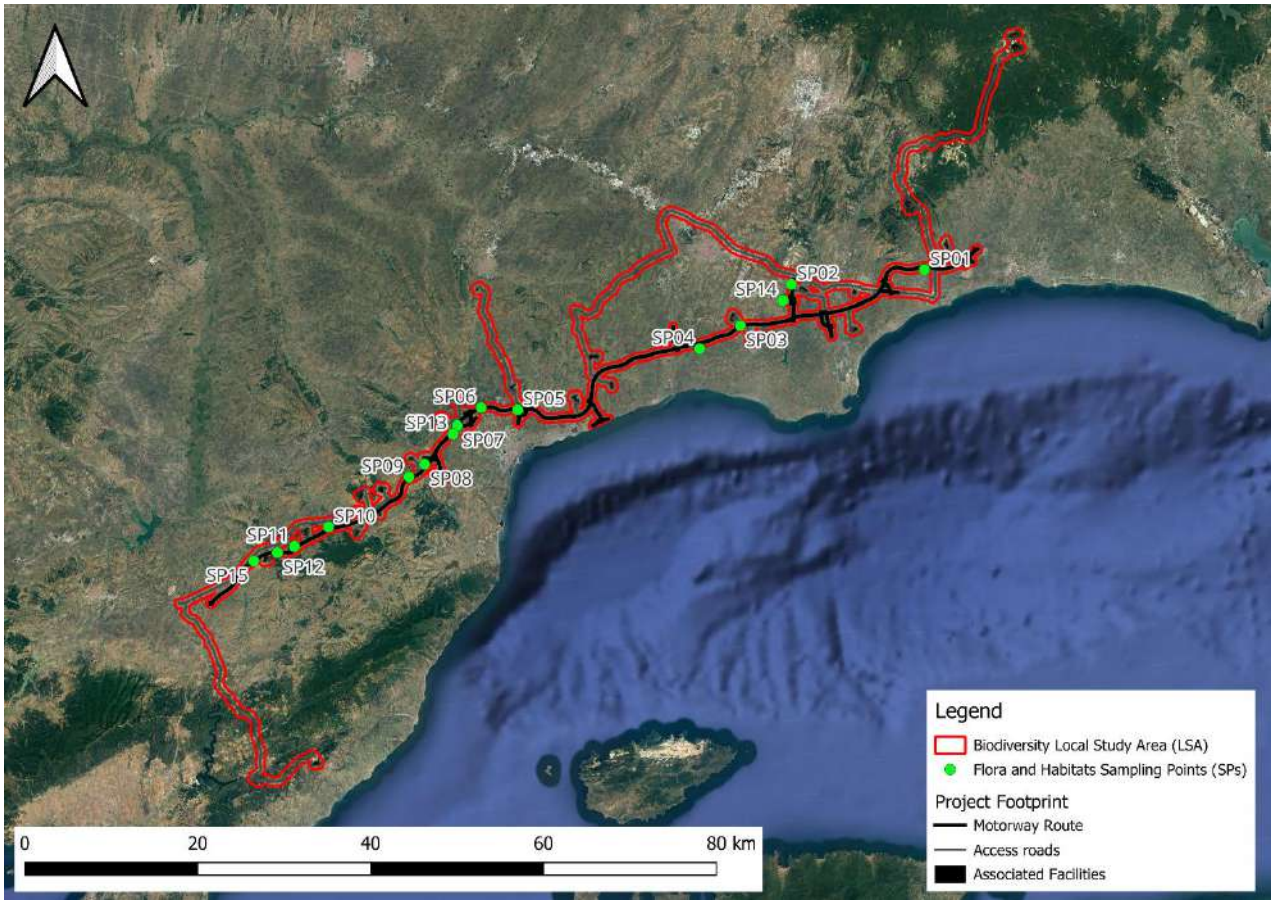



**Figure 66: Flora sampling point locations**

#### 6.2.2.2.2 Freshwater Fish Survey

Field studies for freshwater fauna were conducted from the 25th to the 26th of June 2022 and from the 27th to the 28th of January 2023, by freshwater expert Prof. Aydın Akbulut at freshwater sampling points (FWs) which were identified in correspondence of permanent or seasonal waterbody areas crossed by the LSA.

Prof. Aydın Akbulut is a scientific researcher at the Department of Biology of Hacettepe University, with more than 60 scientific publications in peer-reviewed journals. He is internationally recognized as a freshwater ecology expert and he possesses extensive knowledge of freshwater vertebrate fauna, which was crucial to give confirmation of the information collected through literature consultations. His comprehensive field and research experience conducted in the areas covered by the field study have equipped him with an in-depth understanding of the ecological dynamics and species composition of local freshwater ecosystems. For this reason, his experience was essential for identifying the sections of the watercourses characterized by environmental conditions allowing the presence of freshwater vertebrate fauna species and in particular of sensitive species. In addition, his expertise extends to the assessment of potential impacts on these species.

Prof. Akbulut is author or co-author of many scientific publications related to fish fauna and water quality assessment in several locations in the northern part of Türkiye (Çelik *et al.*, 2010[73], Özgür *et al.*, 2012[74], Tuncer *et al.*, 2015[75]). His publications are also related to impacts affecting freshwater ecosystems, such as salinity (Akbulut, 2010[76]), eutrophication (Rashidi *et al.*, 2020[77]), and pollution deriving from heavy metal dispersion, related accumulation in different environmental compartments and in fish tissues (Akbulut & Akbulut, 2009[78]). He is also co-author of some publications specifically focused on the biology of some fish species, such as the threatened (globally classified as VU) *Luciobarbus esocinus* (Özgür *et al.*, 2016[79]). Finally, Prof. Akbulut is also co-author of two important recent scientific books representing the most updated information on the biological, ecological, hydrological, geomorphological characteristics in river basins and related impacts deriving from human activities, for 180 rivers in Europe (Tockner *et al.*, 2022[80]) and the 107 major rivers crossing Türkiye (Akbulut *et al.*, 2022[81])

A total of 16 different locations (FWs) were investigated during the two campaigns, with 10 locations sampled during each campaign and 4 locations sampled during both campaigns.

The GPS coordinates (WGS84 UTM Zone 35N) of the FWs investigated were taken and are listed in Table 70, while their location is showed in Figure 67. Pictures of each sampling station are shown in Figure 68 and Figure 69.

[73] Çelik, K., Akbulut, N., Akbulut, A., Özatli, D. (2010). Macro zoobenthos of lake uluabat, turkey, related to some physical and chemical parameters. Pan-American Journal of Aquatic Sciences. 5. 520-529.

[74] Özgür, M., Akbulut, A., Demirsoy, A. (2012). Some quality parameters of surface water of Karasu River in upper part of Euphrates Basin, Turkey. Carpathian Journal of Earth and Environmental Sciences. 7. 183-192.

[75] Tuncer, A., Tunoğlu, C., Akbulut, A., Gumus, H., Köse, T., Salış, K. (2015). Distribution of ostracod and diatom assemblages in Beyler Dam Pond, Kastamonu, Northern Turkey.

[76] Akbulut, A. (2010). The Diatom Composition of the Salt Lake Basin and Its Relationship with Salinity. Ekoloji. 19. 150-159. 10.5053/ekoloji.2010.7418.

[77] Rashidi, A., Saydam, C., Akbulut, A. (2020). Eutrophication and Its Some Relationships Between Desert Dusts.

[78] Akbulut, A., Akbulut, N. (2009). The study of heavy metal pollution and accumulation in water, sediment, and fish tissue in Kizilirmak River Basin in Turkey. Environmental monitoring and assessment. 167. 521-6. 10.1007/s10661-009-1069-4.

[79] Özgür, M., Akbulut, A., Demirsoy, A. (2016). Characterization of the Embryonic and Larval Development of Wild Pike-Barb (Luciobarbus esocinus) Biological Parameters, and the Possibility of Breeding. Israeli Journal of Aquaculture - Bamidgeh. 68. 10.46989/001c.20830.

[80] Tockner, K., Zarfl, C., Robinson, C., Aamodt, K., Skuja, A., Agrita, B., Akbulut, N., Akbulut, A., Alexevnina, M., Andersen, H., Arnaut, N., Ayrault, S., Baklanov, M., Barthélémy, C., Bäthe, J., Baumgartner, C., Bayari, S., Behrendt, H., Beisel, J., Zogaris, S. (2022). Rivers of Europe (Second Edition). 10.1016/C2017-0-03745-X.

[81] Akbulut, N., Bayari, S., Akbulut, A., Özyurt, N., Sahin, Y. (2022). Rivers of Turkey. 10.1016/B978-0-08-102612-0.00021-3.

Each sampling location was examined in detail and field notes and GPS coordinates were recorded. The habitats were described and then categorized according to the EUNIS classification system. A list of fish species identified was compiled at each sampling point. Disturbance types and level were also reported.

This freshwater fauna survey was focused on investigating freshwater habitats with the highest potential for hosting fish Target Species, in order to determine their presence. Electrofishing equipment or other standard non-lethal techniques deemed appropriate by local experts were used for the surveys. Each survey continued for 20-35 minutes in the vicinity of the selected sampling point.

**Table 70: Freshwater fauna sampling points coordinates**

| ID | Coordinates (Meters, WGS84 UTM Zone 35N) | | Survey Date | Rivers |
|---|---|---|---|---|
| | Longitude | Latitude | | |
| FW01 | 551310 | 4540007 | 25/06/2022 | Marmara Basin |
| FW02 | 594534 | 4549550 | 25/06/2022<br>27/01/2023 | Marmara Basin |
| FW03 | 592108 | 4550652 | 25/06/2022 | Marmara Basin |
| FW04 | 582421 | 4547254 | 25/06/2022<br>27/01/2023 | Marmara Basin (Kumlubağa Creek) |
| FW05 | 575426 | 4546845 | 25/06/2022 | Marmara Basin (Kum Creek) |
| FW06 | 563530 | 4545526 | 25/06/2022 | Marmara Basin |
| FW07 | 557344 | 4544946 | 25/06/2022<br>28/01/2023 | Marmara Basin |
| FW08 | 535358 | 4539188 | 25/06/2022 | Meriç-Ergene Basin |
| FW09 | 523661 | 4530687 | 26/06/2022<br>28/01/2023 | Meriç-Ergene Basin |
| FW10 | 505285 | 4523941 | 26/06/2022 | Meriç-Ergene Basin (Çayırlar creek) |
| FW11 | 547512 | 4539396 | 28/01/2023 | Marmara Basin |
| FW12 | 504955 | 4513354 | 28/01/2023 | Meriç-Ergene Basin (Aksakal Creek) |
| FW13 | 561520 | 4540965 | 28/01/2023 | Marmara Basin |
| FW14 | 575991 | 4545879 | 27/01/2023 | Marmara Basin (Kum Creek) |
| FW15 | 606384 | 4576770 | 27/01/2023 | Karaçay Basin (Mandıra Creek) |
| FW16 | 560359 | 4557721 | 27/01/2023 | Meriç-Ergene Basin (Çorlu Stream) |

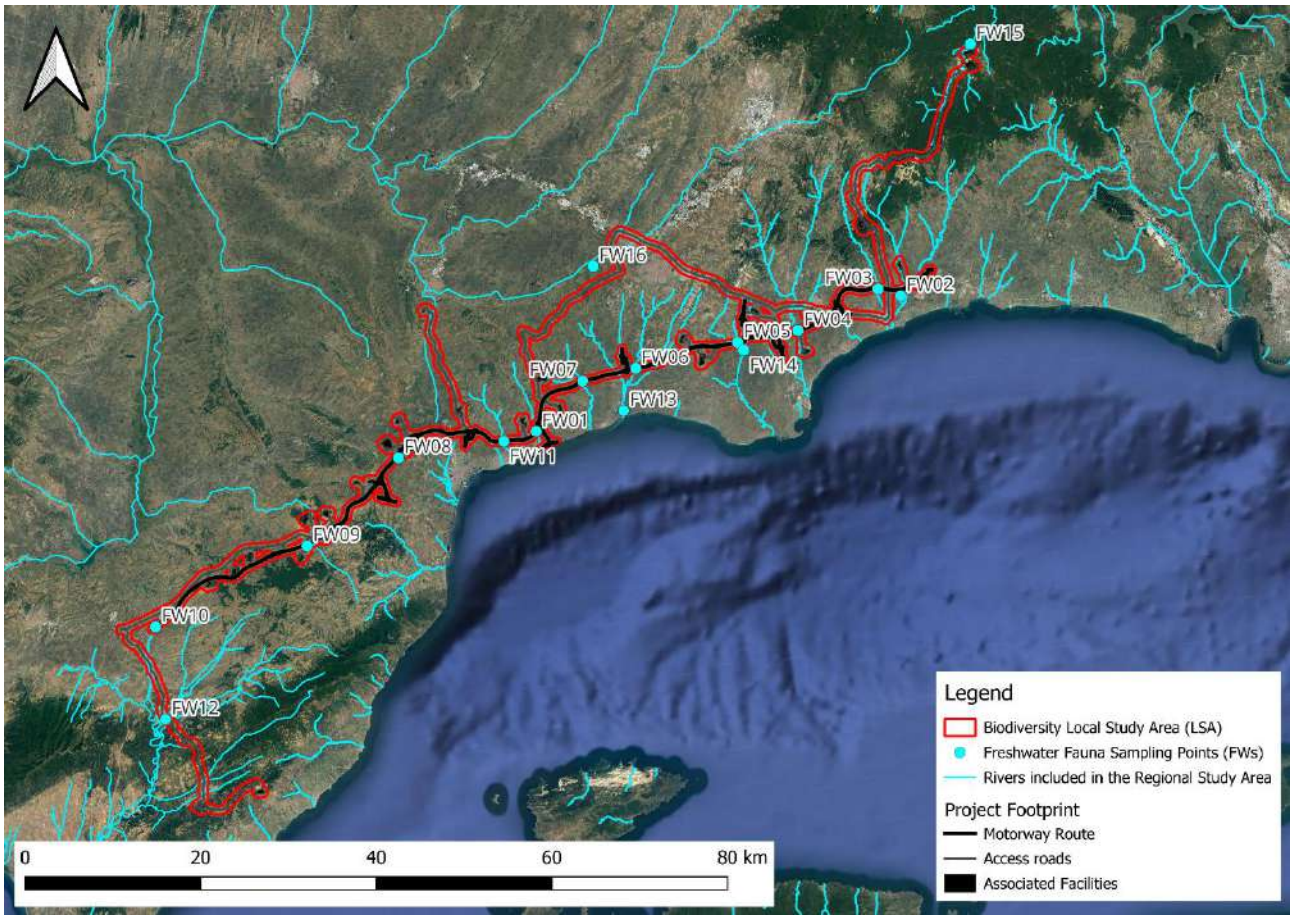



**Figure 67: Freshwater fauna sampling point locations**




**Figure 68: Sampling stations from FW01 to FW8 (from top left to bottom right)**




**Figure 69: Sampling stations from FW09 to FW16 (from top left to bottom right)**

#### 6.2.2.2.3 Terrestrial Fauna Survey

Field survey on terrestrial fauna was carried out at 13 different fauna sampling points (FPs) within the LSA by expert zoologist Dr. Safak Bulut on the 22nd and the 23rd of June 2022.

Dr. Safak Bulut is a scientific researcher and assistant professor at the Department of Biology of Hitit University. His current research is focused on small mammals' phylogeny through the use of molecular markers. With his extensive fieldwork and research experience in wildlife ecology and conservation, together with about 40 scientific publications in peer-reviewed international journals, he can be considered as one of the most important references for knowledge of fauna diversity in Türkiye. In particular, his extensive experience in the areas covered by the field study was crucial for him in order to identify the habitat patches characterized by the highest probability to host fauna species of conservation concern. His prior experience in detailed assessments of local wildlife populations, habitat preferences, and ecological interactions was also essential in order to assess the potential impacts deriving from the Project on the different taxa of fauna. The expert has authored the book Mammals of Turkey (Özkurt and Bulut, 2020[82]), which explores the distribution, ecology, and IUCN categories of all mammal species found in Turkey. Additionally, the expert has conducted research on endangered mammal species in Turkey (Seyfi et al., 2021[83]). Finally, within the scope of the project, the expert has worked on Spermophilus xanthoprymnus—a species of the genus Spermophilus that triggers critical habitat considerations (Avcı et al., 2014[84]). The fauna expert, in addition to having an academic background in the avian component, has also participated in bird monitoring studies in international projects.

Dr. Safak Bulut can be primarily considered as a wildlife ecologist and evolutionary biologist, with a particularly strong expertise in mammals' diversity and taxonomy. Some of his most recent publications were related to taxonomy, distribution, diet and conservation status of threatened species *Meriones dahli*, globally classified as CR (Bulut *et al.*, 2018[85]; Bulut, 2021[86]; Bulut & Olgun Karacan, 2021[87]). Another quite recent publication is related to genetic analyses conducted on the different species belonging to *Spermophilus* genus distributed in Türkiye (Bulut & Arslan, 2021[88]). As reported in section 6.2.5, the mammal species resulting as triggering Critical Habitat belongs to this genus. He is one of the two authors of an extensive scientific book regarding all the mammals of Türkiye (Bulut & Özkurt, 2021 [89]) and co-author of an extensive scientific publication regarding all the threatened mammal species in Türkiye (Seyfi *et al.*, 2021[90]). He is author or co-author of some publications related to habitat selection for mammal species, demonstrating the gained experience in the monitoring of terrestrial mammals and in the development of habitat suitability models (Mammadov *et al.*,

[82] Özkurt, Ş, Ö., Bulut, Ş. (2020). Türkiye Memelileri. Ankara: Panama Yayıncılık, ISBN: 978-605-7739-57-5.

[83] Seyfi, E., Bulut, Ş., & Karataş, A. (2021). Threatened Mammalian Species in Turkey. *Doğanın Sesi, 4*(7), 54-72 (in Turkish).

[84] Avci, E., Bulut, S., Bircan, F. S., Ozluk, A., & Cevher, S. C. (2014). Effect of hibernation on oxidative and antioxidant events under laboratory conditions in Anatolian Ground Squirrel, Spermophilus xanthoprymnus (Bennett, 1835)(Mammalia: Sciuridae) from Central Anatolia. Pakistan Journal of Zoology, 46(1), 177-183

[85] Bulut, Ş., Akbaba, B., Doğan, M., Ulusoy, K., Karataş, A. (2018). Recent information on population status of Meriones dahli that is close to extinction in the Middle East.

[86] Bulut, Ş. (2021). The present status, distribution, demography, and diet of the Dahl's Jird. Brazilian Journal of Biology. 82. 10.1590/1519-6984.237849.

[87] Bulut, Ş., Olgun Karacan, G. (2021). Taxonomic status of Dahl's Jird, Meriones dahli, as inferred from cytochrome b and IRBP gene sequences (Mammalia: Rodentia). Zoology in the Middle East. 67. 283-289. 10.1080/09397140.2021.1992835.

[88] Bulut, Ş. & Arslan, C. (2021). CYTOGENETICS ANALYSES OF THE GENUS SPERMOPHILUS CUVIER 1825 (MAMMALIA RODENTIA) DISTRIBUTED IN TURKEY. Fresenius Environmental Bulletin. 30. 10976-10982.

[89] Bulut, Ş. & Özkurt, Ö. (2021). Mammals of Turkey Türkiye Memelileri.

[90] Seyfi, E., Bulut, Ş., Karataş, A., Kelimeler, A. (2021). Threatened Mammalian Species in Turkey. 4. 54-72.

2017[91]; Bulut *et al.*, 2018[92]; Bulut *et al.*, 2020[93]). Some publications related to bats' distribution and diversity, more specifically to *Barbastella barbastellus* (Karataş *et al.*, 2020[94]), *Vespertilio murinus* (Karataş *et al.*, 2022[95]), and *Nyctalus lasiopterus* (Yiğit *et al.*, 2008[96]) demonstrate his experience in the monitoring of species belonging to this taxonomic group.

Finally, other scientific publications of Dr. Safak Bulut demonstrate that his monitoring and research experience is not only limited to mammal species but also extends to bird species (Saygılı *et al.*, 2011[97], Bulut et al., 2018[98], Karataş *et al.*, 2019[99], Ulusoy & Bulut, 2020[100], Bulut *et al.*, 2022[101])

The main objective of the field survey performed by Dr. Safak Bulut was to gather data regarding the presence and the distribution of terrestrial fauna species in the areas potentially impacted by the Project within the Project LSA. In addition to this, during the field study, specific attention was given to verifying the presence of the European Ground Squirrel (*Spermophilus citellus*), which had been identified during the desktop analysis of the scientific literature as potentially present within the LSA and as potentially triggering Critical Habitat.

The sampling points were selected with the aim of ensuring coverage of areas characterized by different environmental conditions, which could support the presence of fauna species belonging to various taxonomic groups and with differing ecological requirements. In addition, the definition of point locations also took into consideration the need of monitoring specific patches of habitats potentially suitable for *Spermophilus citellus* (IUCN, 2020[102]; Ramos-Lara *et al.*, 2014[103]).

Indeed, this species has quite specific habitat requirements. It is restricted to short-grass steppe and similar artificial habitats (pastures, airfields, lawns, sports fields, golf courses vineyards) on light, well-drained soils, where it can excavate its burrows.

At each sampling point a walkover survey within the selected habitat was conducted, targeting micro-habitats and eco-tones suitable for the presence of the target species. The surveyors searched for direct or indirect signs of the presence of the species, such as burrows in the ground, droppings or direct observations of

[91] Mammadov, R., Düşen, O., Düşen, S., Gürçay, K., Akyildiz., Bulut, Ş., Ayas, Z. (2017). Habitat Selection of Small Mammals in Soğuksu National Park (Ankara) in Turkey.

[92] Bulut, Ş., Akbaba, B., Karataş, A. (2018). Habitat preferences of small mammal species distributed in the eastern Black Sea region in Turkey.

[93] Bulut, Ş., Ayas, Z., Karataş, A. (2020). HABITAT SELECTION OF SMALL MAMMALS IN A MIXED FOREST IN TURKEY. Applied Ecology and Environmental Research. 19. 133-147. 10.15666/aeer/1901_133147.

[94] Karataş, A., Bulut, Ş., Karataş, A., Toprak, F., Özkurt, Ö. (2020). Contribution to the natural history of Barbastella barbastellus in Turkey (Chiroptera: Vespertilionidae). 51. 49-63. 10.37520/lynx.2020.005.

[95] Karataş, A., Bulut, Ş., Sefali, A., Toprak, F., Şahin, M., Özkurt, Ö. (2022). Contributions on the southern distribution of Vespertilio murinus Linnaeus, 1758 (Chiroptera: Vespertilionidae) from Türkiye. Turkish Journal of Zoology. 46. 434-443. 10.55730/1300-0179.3097.

[96] Yiğit, N., Bulut, Ş., Karataş, A., Çam, P., Saygılı Yiğit, F. (2008). Contribution to the Distribution, Morphological Peculiarities, and Karyology of the Greater Noctule, Nyctalus lasiopterus (Chiroptera: Vespertilionidae), in Southwestern Turkey. Turkish Journal of Zoology. 32. 53-58.

[97] Saygılı Yiğit, F., Yiğit, N., Bulut, Ş. (2011). The spatial and temporal distributions of waterbirds in Lakes Akşehir-Eber and Lake Köyceğiz in western Anatolia, Turkey - A comparative analysis. Turkish Journal of Zoology. 35. 467-480. 10.3906/zoo-0911-99.

[98] Bulut, Ş., Akbaba, B., Şahin, M. (2018). The Effects of Chemical Applications in Agriculture On Farmland Birds.

[99] Karataş, A., Bulut, Ş., Karataş, A. (2019). New distribution records of Bohemian Waxwing Bombycilla garrulus (Linnaeus, 1758) from Turkey. Biharean Biologist. 13. 58-59.

[100] Ulusoy, K., Bulut, Ş. (2020). Wintering Bird Diversity and Population Sizes at Obruk Dam Lake (Corum) in Turkey. Hittite Journal of Science & Engineering. 7. 353-358. 10.17350/HJSE19030000205.

[101] Bulut, Ş., Karataş, A., Murat, D., Seyfi, E., Isfendiyaroglu, S. (2022). Tuz Gölündeki Flamingo, Phoenicopterus roseus'un populasyon büyüklüğü ve üreme kolonileri [#1136259]-2509178. 5. 31-38.

[102] Hegyeli, Z. 2020. *Spermophilus citellus*. The IUCN Red List of Threatened Species 2020: e.T20472A91282380. https://dx.doi.org/10.2305/IUCN.UK.2020-2.RLTS.T20472A91282380.en. Accessed on 27 May 2022.

[103] Nicolás Ramos-Lara, John L. Koprowski, Boris Kryštufek, Ilse E. Hoffmann, *Spermophilus citellus* (Rodentia: Sciuridae), Mammalian Species, Volume 46, Issue 913, 12 December 2014, Pages 71–87.

individuals. The search continued for 20-30 minutes in the vicinity of each of the selected sampling points. Moreover, incidental observations of other fauna species were recorded.

In addition, at each sampling point EUNIS habitat categories were verified on the ground, with regards to the definition of Natural Habitats and Modified Habitats (IFC PS6, 2019).

The 13 sampling points with their relative coordinates are given in Table 71, while their location is shown in Figure 70.

**Table 71: Terrestrial fauna sampling points coordinates within the LSA**

| Field ID | Coordinates (Meters, WGS84 UTM Zone 35N) | | Survey Date |
|---|---|---|---|
| | Longitude | Latitude | |
| FP01 | 576552 | 4550904 | 23/06/2022 |
| FP02 | 576301 | 4550451 | 23/06/2022 |
| FP03 | 575159 | 4548622 | 23/06/2022 |
| FP04 | 582572 | 4547334 | 23/06/2022 |
| FP05 | 570158 | 4547062 | 23/06/2022 |
| FP06 | 570227 | 4546289 | 23/06/2022 |
| FP07 | 535893 | 4540117 | 22/06/2022 |
| FP08 | 533155 | 4537488 | 22/06/2022 |
| FP09 | 529717 | 4534818 | 22/06/2022 |
| FP10 | 519825 | 4530414 | 22/06/2022 |
| FP11 | 515701 | 4528742 | 22/06/2022 |
| FP12 | 513325 | 4528604 | 22/06/2022 |
| FP15 | 510472 | 4527856 | 22/06/2022 |

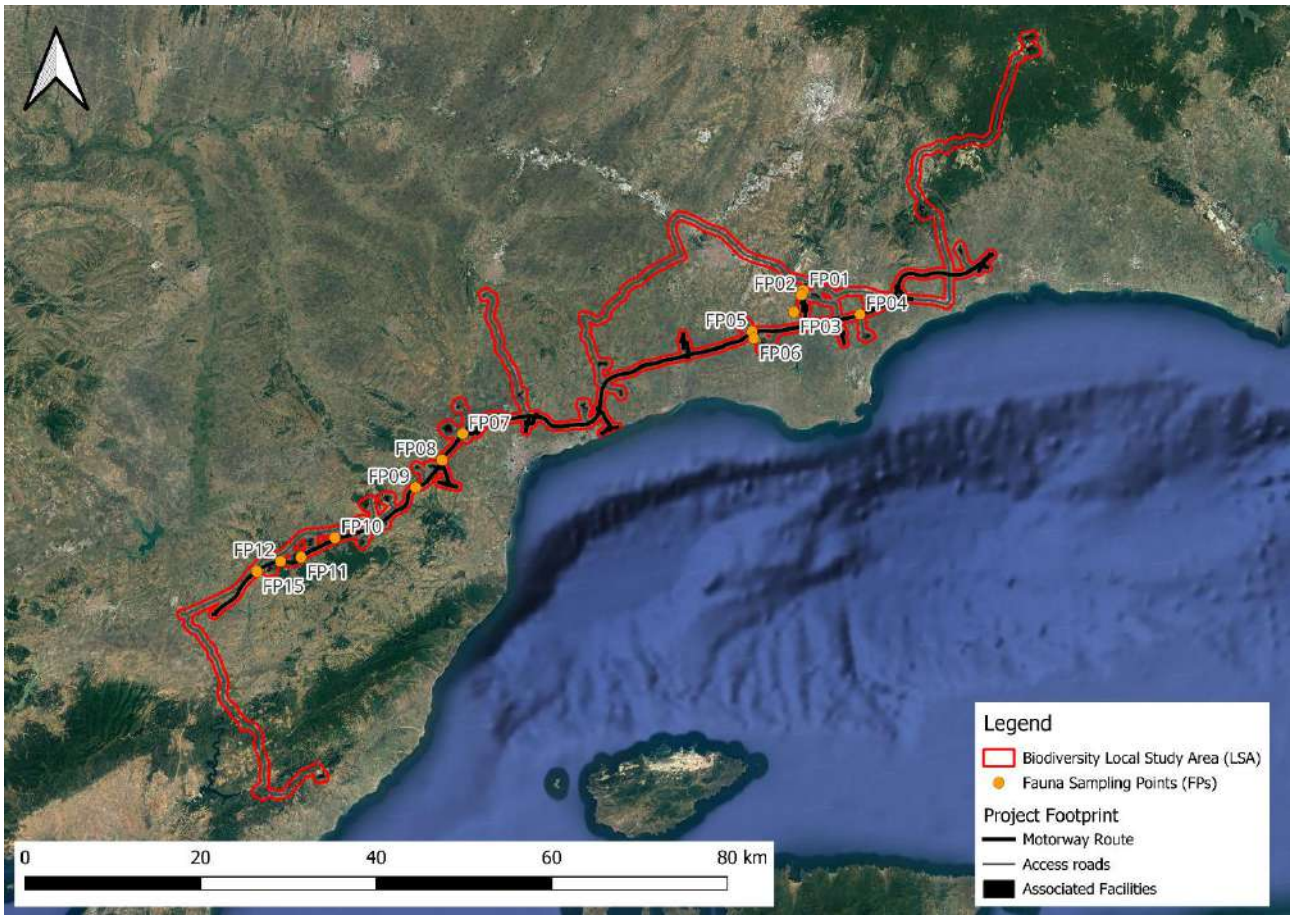



**Figure 70: Fauna sampling point locations**

### *6.2.2.3 Habitat Mapping*

Habitat types were identified and mapped in the entire Local Study Area (LSA) at a fine scale (1:10.000) according to EUNIS classification based on satellite image and literature information, including Corine Land Cover.

The procedure used for the habitat mapping was as follows:

1. A general land cover map was created using the Corine Land Cover 2018 v.2020_2021 available on the Copernicus website.

2. The CORINE Land Cover classes were converted into EUNIS Habitat categories using the highest possible definition level (level 3 at least) by analyzing appropriate satellite imagery.

3. The results of flora and habitats surveys conducted in June 2022 were used to validate the EUNIS habitat mapping.

4. EUNIS habitat types were then categorized into modified or natural habitats according to PS6 (IFC PS6, 2019).

Since the flora and habitat field surveys conducted in June 2022 could not cover all the areas located within the Project LSA and identified as corresponding to natural habitats, according to the performed desktop analysis, additional verification field surveys will be carried out in order to verify that the EUNIS habitat mapping is correct and to collect data on the quality of habitats (e.g. conservation level, degradation factors, degradation levels). Should significant changes be detected through the above verification surveys, quantification of natural and modified habitats, and habitat mapping, as well as calculation reported in section 6.2.3.2, the modifications

will be reflected in subsequent documents, such as the updated BMP or BAP. These additional verification surveys will be performed as soon as possible. Nevertheless, the planning for these surveys shall also consider the species phenology and the seasonality for the collection of detailed information on biodiversity. For this reason, we suggest considering also April-June as the best period for collecting reliable and complete data on the majority of flora species during the flowering period and many fauna species. The gathered information on the distribution on natural and modified habitats will be essential for the full understanding of impacts and for the identification of type and extent of required offsets for biodiversity component. Additional verification will be carried out through pre-construction surveys to address final design of mitigation and offset needs.

### 6.2.3 Results

#### *6.2.3.1 Ecoregions*

The Project LSA is located within the "**PA0404 - Balkan mixed forests**" terrestrial ecoregion. Its vegetation is characterized by forests and grasslands of Central Europe. The climate in the region is mostly of Köppen's humid subtropical (Cfa) to humid warm summer continental (Dfb) type, characterized by wet winters. Some areas of relatively high rainfall have been considered a temperate rainforest relict.

The diversity of flora and fauna is relatively high compared to the rest of Europe with a high number of endemic plant species. Mixed oak forests are typical of the area, with *Quercus frainetto* as the dominant tree species. Oak forests are interspersed with pine, silver fir (*Abies alba*) and Norway spruce (*Picea abies*) forests, woodland-pastures, shrublands and grasslands (Ozenda, 1994[104]). High valleys and sheltered slopes feature forests are dominated by beech (*Fagus sylvatica*) and hornbeam (*Carpinus orientalis* and *C. betulus*). Moreover, the region's herpetofauna is among the most diverse in Europe.

The **freshwater LSA** includes three river basins:

- Meriç-Ergene Basin that drain in the Mediterranean and it is part of the "423 - Thrace" freshwater ecoregion. The main rivers of the Meriç-Ergene Basin are characterized by a fairly gentle gradients, with lower reaches that can even be marshy. The main sub-basin interested by the Project belongs to the Hayrabolu Stream and Çorlu stream, which flow into the Ergene River and into the Meriç River, and the Kocadere River sub-basin. Both the Kocadere River and the Meriç River flow into the Mediterranean Sea.
- Marmara Basin that drains in the Marmara see, also part of the "423 - Thrace" freshwater ecoregion, characterized by short and often temporary streams and rivers.
- Karaçay Basin which drain in the Black Sea, and it is part of the "418 - Dniester - Lower Danube" freshwater ecoregion. The main permanent stream interested by the project is the Mandıra Stream, which then flows into the Binkılıç Creek and then Karaçay River until finally flowing into the Black Sea.

All the other watercourses in the freshwater LSA are mainly temporary tributaries of the above-mentioned rivers.

In the north-eastern portion, the LSA falls within the boundaries of the legally protected area **Terkos Basin KBA[105], IBA[106] and IPA[107]** (Figure 71). The Terkos Basin KBA, IBA and IPA is located in the north of the Çatalca Peninsula, mostly within the Istanbul province, at an elevation between 0 - 490 m and it includes the Terkos Lake. This KBA hosts a rich vegetation with forests, heaths, freshwater ecosystems and dunes. Also, where forest vegetation is widespread, it is home to the largest coppice forests in Türkiye. On the dry hills and

[104] Ozenda, P. (1994). *Végétation du continent européen*. Delachaux et Niestlé.

[105] Key Biodiversity Area – Source: https://www.keybiodiversityareas.org/

[106] Important Birds and Biodiversity Area – Source: https://datazone.birdlife.org/country

[107] Important Plant Areas – Source: https://www.plantlifeipa.org/home

southern slopes there are heaths within the forested areas. The pristine nature of the Terkos Lake has resulted in an extremely rich wetland system with well-preserved habitats and rare plant species. Moreover, Lake Danamandıra, located in the central region of the CBA, is one of the rare acidic wetlands within the heath and coppice area. The area is triggered by 17 flora species and some of them are endangered on a global scale. Moreover, this area hosts several species of breeding waterbirds such as the ferruginous duck (*Aythya nyroca*), the lesser spotted eagle (*Clanga pomarina*), the little bittern (*Ixobrychus minutus*) and the squacco heron (*Ardeola ralloides*). Other species present are the red-breasted goose (*Branta ruficollis*), the white-tailed eagle (*Haliaeetus albicilla*) and the greater spotted eagle (*Clanga clanga*), which are endangered worldwide. Terkos lake hosts more than 10.000 waterbirds at the same time in winter. *Branta ruficollis, Aythya nyroca, Ciconia nigra, Microcarbo pygmaeus* and *Chilidonias hybrida* are the species triggering IBA criteria. The main mammal species triggering the KBA are the long-fingered bat (*Myotis capaccinii*), the Mediterranean horseshoe bat (*Rhinolophus euryale*), the lesser blind mole-rat (*Nannospalax leucodon*), the European ground squirrel (*Spermophilus citellus*). The lake is also important for amphibians such as the European fire-bellied toad (*Bombina bombina*) and the southern crested newt (*Triturus karelinii*).

Lastly, the **Atatürk Ormanı Nature Park** is a further protected area located at approximately 650 m from the borders of the LSA and that does not interfere with the Project. Atatürk Ormanı Nature Park is an Urban Park with an extension of 29,61 ha created along the Tekirdağ-Istanbul highway for recreational porpoise within the city of Tekirdağ. The Park includes areas equipped with fountains, tables and barbecue areas.

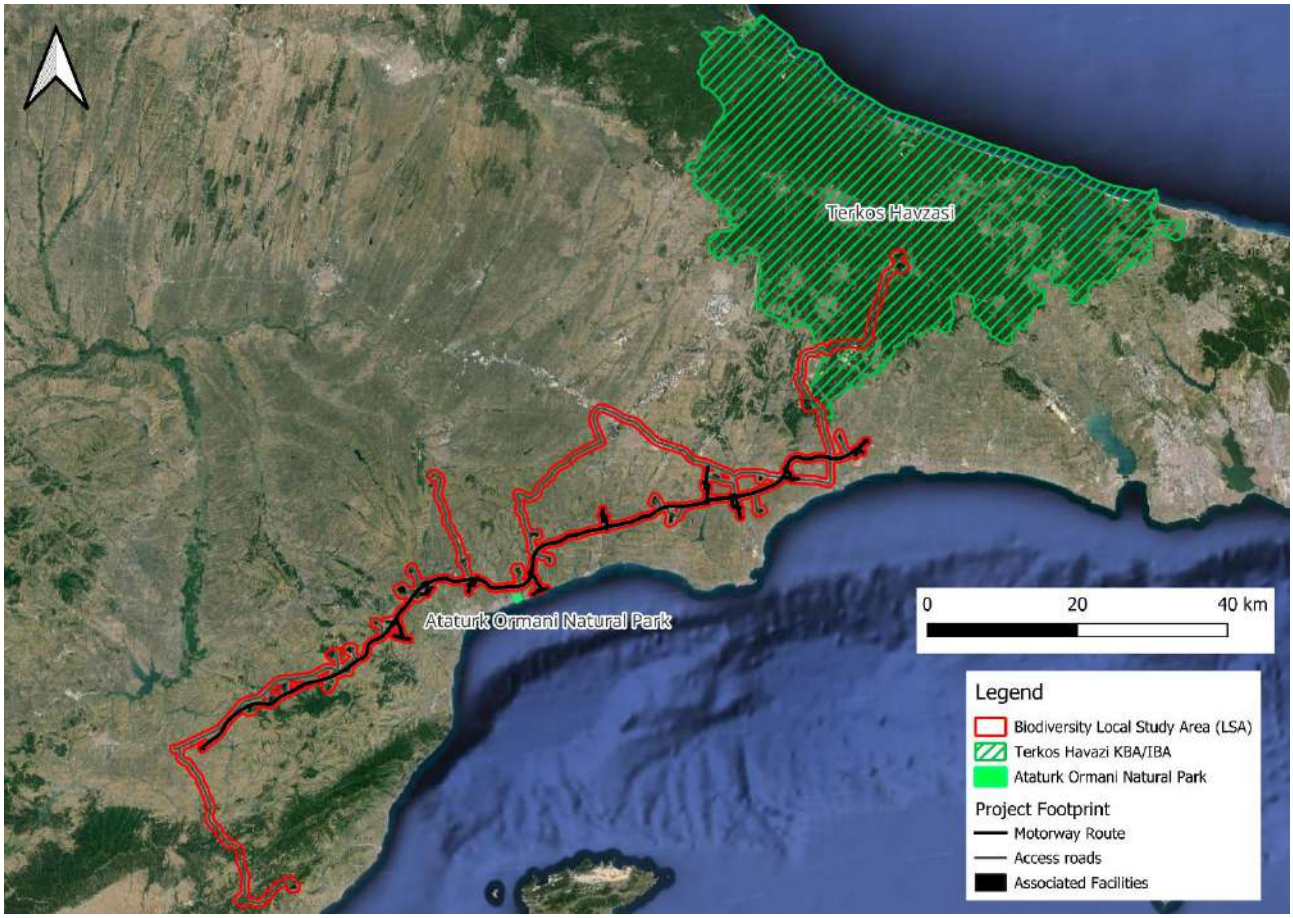



**Figure 71: Protected areas and Internationally Recognized Areas of importance for biodiversity in the vicinity of the LSA**

### 6.2.3.2 Natural and Modified Habitats

The Natural and Modified habitats present within the LSA were determined based on literature review, analysis of satellite images on Google Earth and field surveys conducted in June 2022 during flora field studies. Despite the limited number of field working days and of sampling points, which did not allow to accurately cover all the areas potentially impacted by the Project, the reliability of the results deriving from the field survey is considered to be significantly enhanced by the extensive experience of the local expert Prof. Hayri Duman, who has previously worked in the areas under monitoring. The prior work has equipped him with the insights necessary to perform the survey according to a specific methodology tailored to the unique characteristics of each site. In addition, his prior experience in the areas has been instrumental in validating the information gathered through literature analysis. His in-depth knowledge of the region's habitats allowed for a comprehensive cross-referencing of data, ensuring accuracy and reliability.

The great majority of the habitats present within the LSA are characterized by Modified habitats (84%) and in particular intensive unmixed crops (I1.1, 71%), mosaic landscapes with woodlands (X10, 7%) and residential building (3%).

Natural habitats present in the LSA (16%) are fragmented and often limited to deciduous woodlands and pastures. The main natural habitats found in the area are thermophilous deciduous woodland (G1.7, 8%), followed by permanent mesotrophic pastures and aftermath-grazed meadows (E2.1, 3%) and small broadleaved deciduous anthropogenic woodlands (G5.2, 2%). Watercourses as well as other woodlands and grasslands habitats are also present with a limited distribution. These habitats are characterized by medium to high anthropic disturbance levels, mainly due to fragmentation from agricultural activities and plantations as well as industrial sites.

The habitat map of the LSA according to EUNIS habitat classification system is available in Figure 72 and illustrated in more detail in Figure 73, Figure 74 and Figure 75. The extensions of each habitat presented in Table 72. In addition, Figure 76, Figure 77 and Figure 78 show a representation of the habitat map of the LSA where Natural and Modified habitats are clearly distinguished. Finally, a brief description for each EUNIS natural habitat identified in the area is reported below.

As reported in section 6.2.2.3, the performed flora and habitat field surveys could not cover all the areas located within the Project LSA and identified as corresponding to natural habitats, according to the performed desktop analysis, based on CORINE Land Cover geographical information, EUNIS habitat classification and photointerpretation of satellite imagery. For this reason, additional verification field surveys will necessarily be carried out in order to inform a more detailed and precise quantification of natural and modified habitats, possibly determining an update of the habitat mapping presented in the figures below and of the extent calculations reported for each habitat category in Table 72 in subsequent documents, such as the updated BMP or BAP . Verification surveys will be also carried out in order to provide ground-truthing of all the areas identified as critical habitats, according to the results of the assessment described in section 6.2.4. These additional surveys will also aim at collecting primary data on the quality of natural and critical habitats (e.g. conservation level, degradation factors, degradation levels).

**Table 72: EUNIS habitat types present in the LSA**

| EUNIS Habitat Type | Total LSA | |
|---|---|---|
| | ha | % |
| **Natural Habitats** | | |
| C2.3 - Permanent non-tidal, smooth-flowing watercourses | 68.07 | <1 |
| C2.5 - Temporary running waters | 111.49 | <1 |
| E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows | 1,251.79 | 3 |

| EUNIS Habitat Type | Total LSA | |
|---|---|---|
| | ha | % |
| E3.2 - Mediterranean short humid grassland | 85.25 | <1 |
| G1.7 - Thermophilous deciduous woodland | 3,007.42 | 8 |
| G4 - Mixed deciduous and coniferous woodland | 295.11 | <1 |
| G5.2 - Small broadleaved deciduous anthropogenic woodlands | 589.70 | 2 |
| G5.7 - Coppice and early-stage plantations | 290.33 | <1 |
| *Subtotal* | 5,699.16 | 16 |
| **Modified Habitats** | | |
| I1.1 - Intensive unmixed crops | 25,969.24 | 71 |
| I1.3 - Arable land with unmixed crops grown by low-intensity agricultural methods | 672.70 | 2 |
| J1.7 - High density temporary residential units | 34.20 | <0.1 |
| J2.1 - Scattered residential buildings | 994.40 | 3 |
| J2.3 - Rural industrial and commercial sites still in active use | 471.72 | 1 |
| J3 - Extractive industrial sites | 176.72 | <1 |
| J4.2 - Road networks | 112.28 | <1 |
| X10 - Mosaic landscapes with a woodland element (bocages) | 2,393.13 | 7 |
| *Subtotal* | 30,824.39 | 84 |
| ***Total*** | **36,523.55** | **100** |

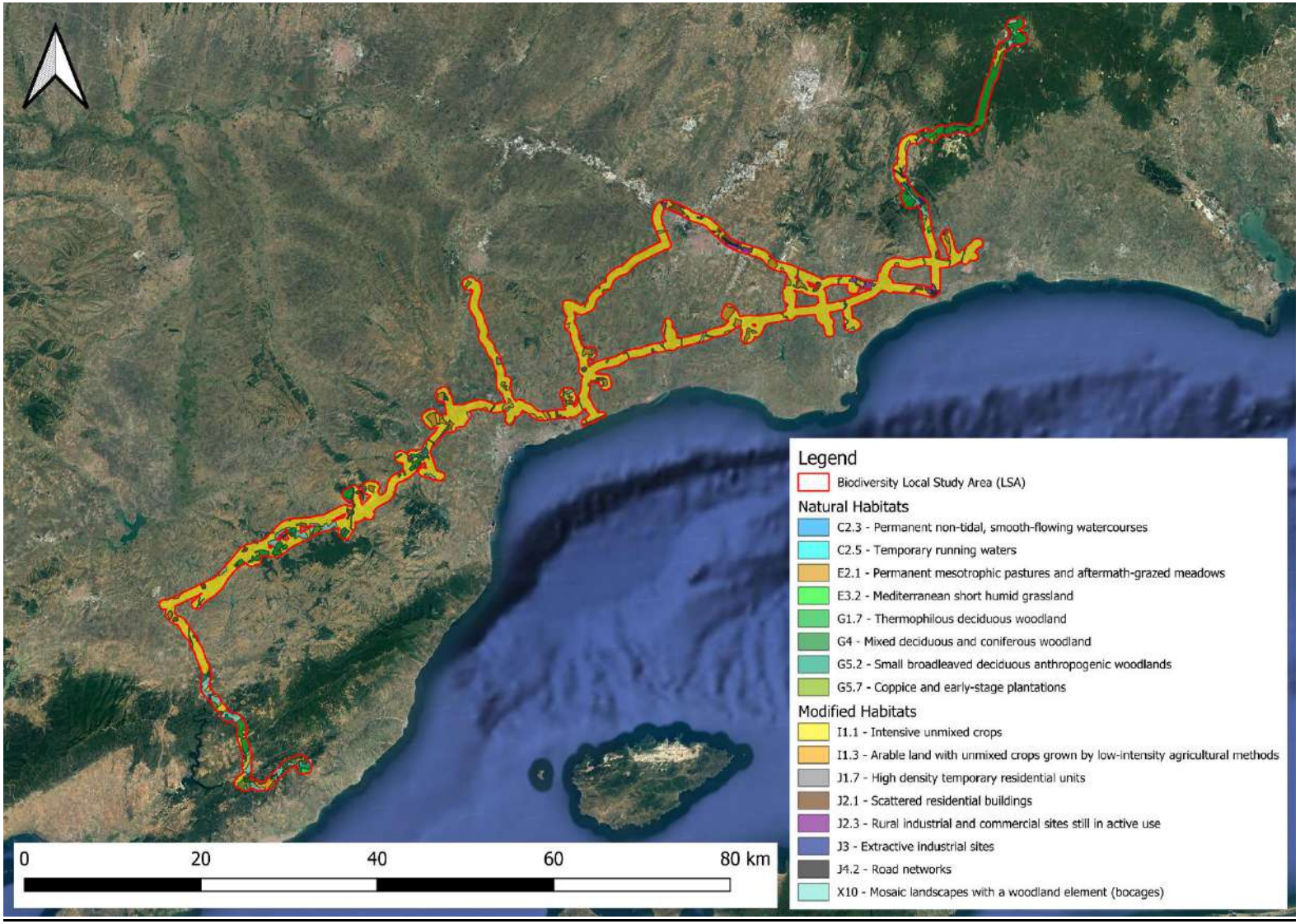



**Figure 72: EUNIS Habitat Map of the Biodiversity LSA (general view)**

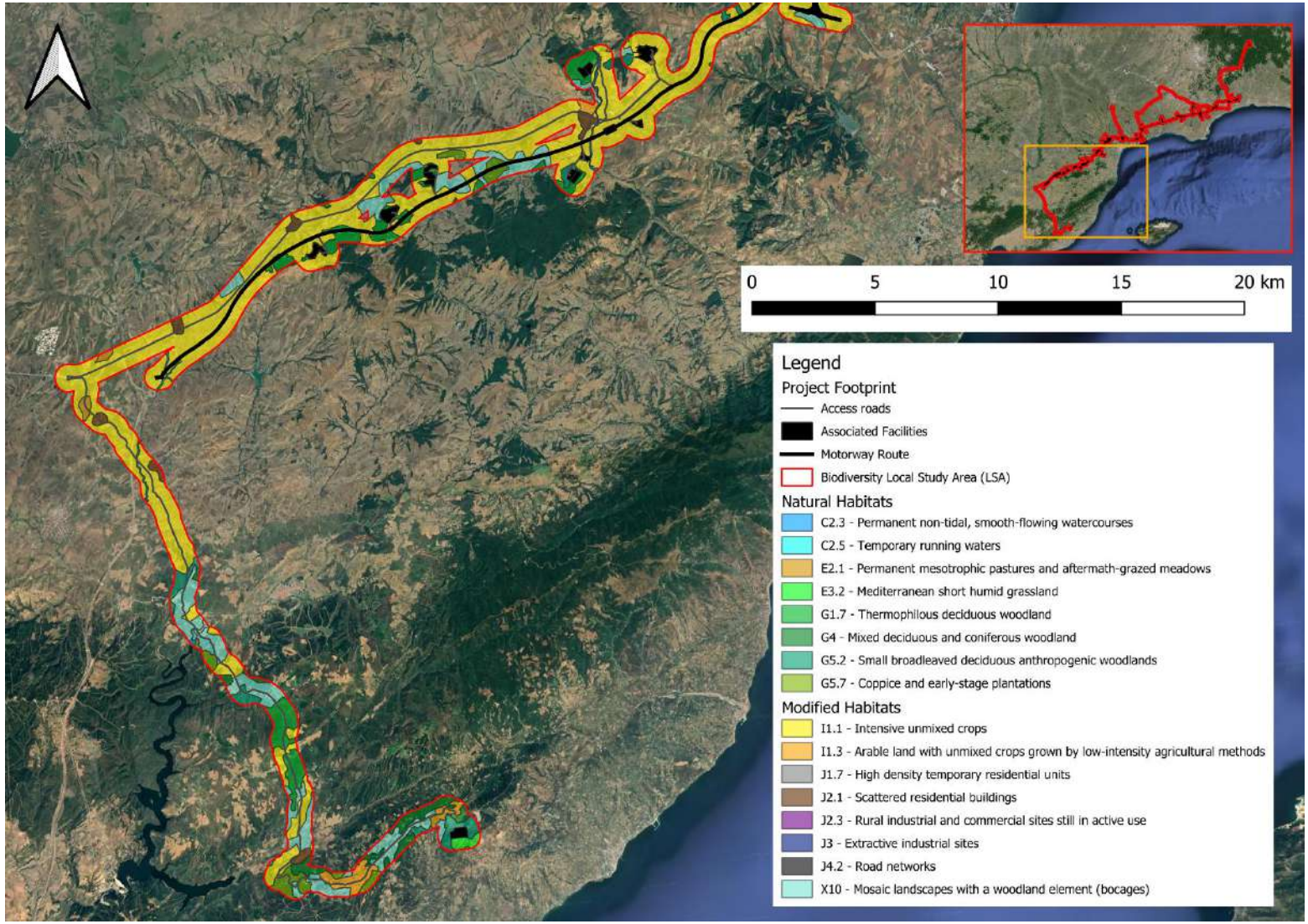



**Figure 73: EUNIS Habitat Map of the Biodiversity LSA (south-western section view)**

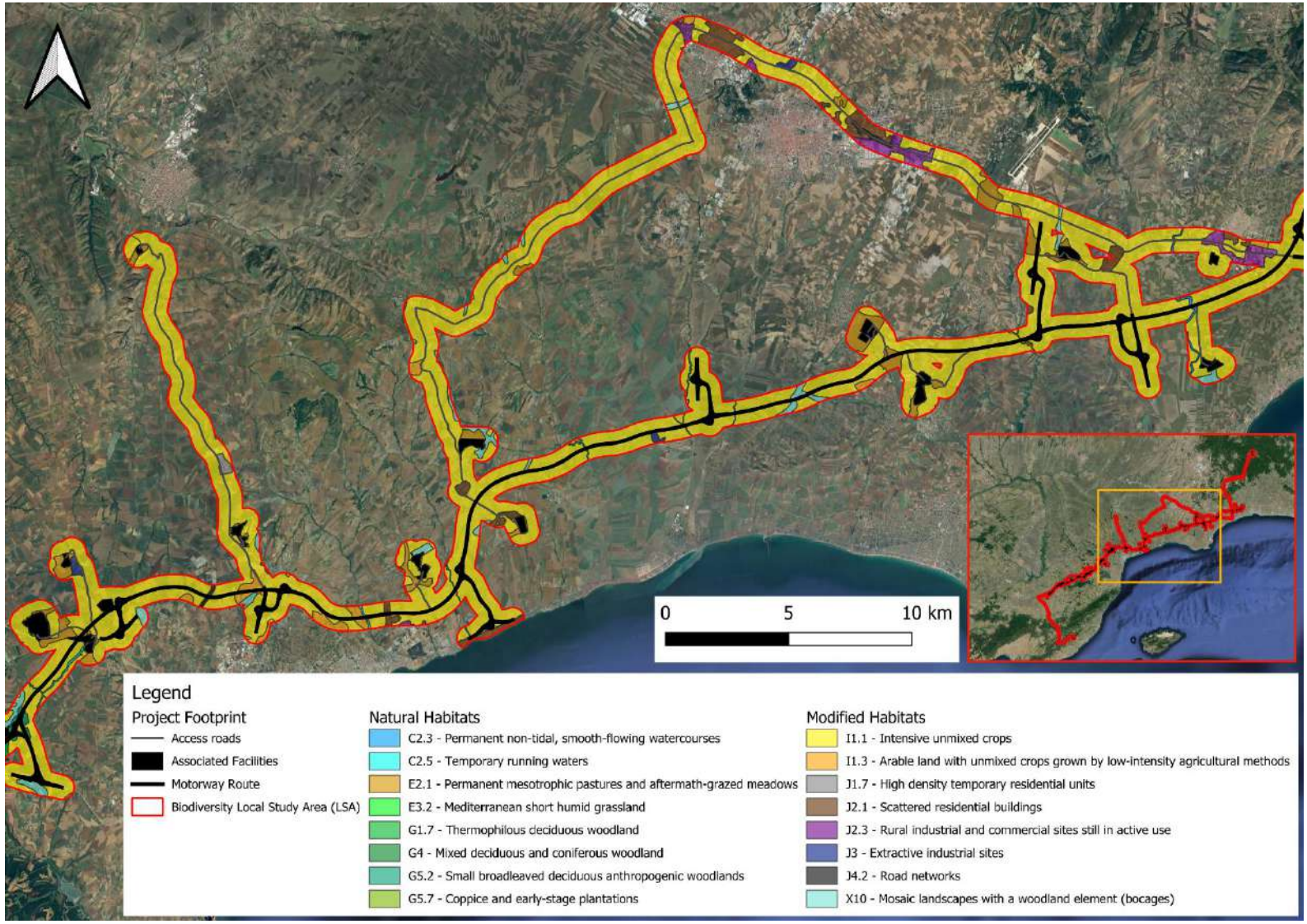



**Figure 74: EUNIS Habitat Map of the Biodiversity LSA (central section view)**

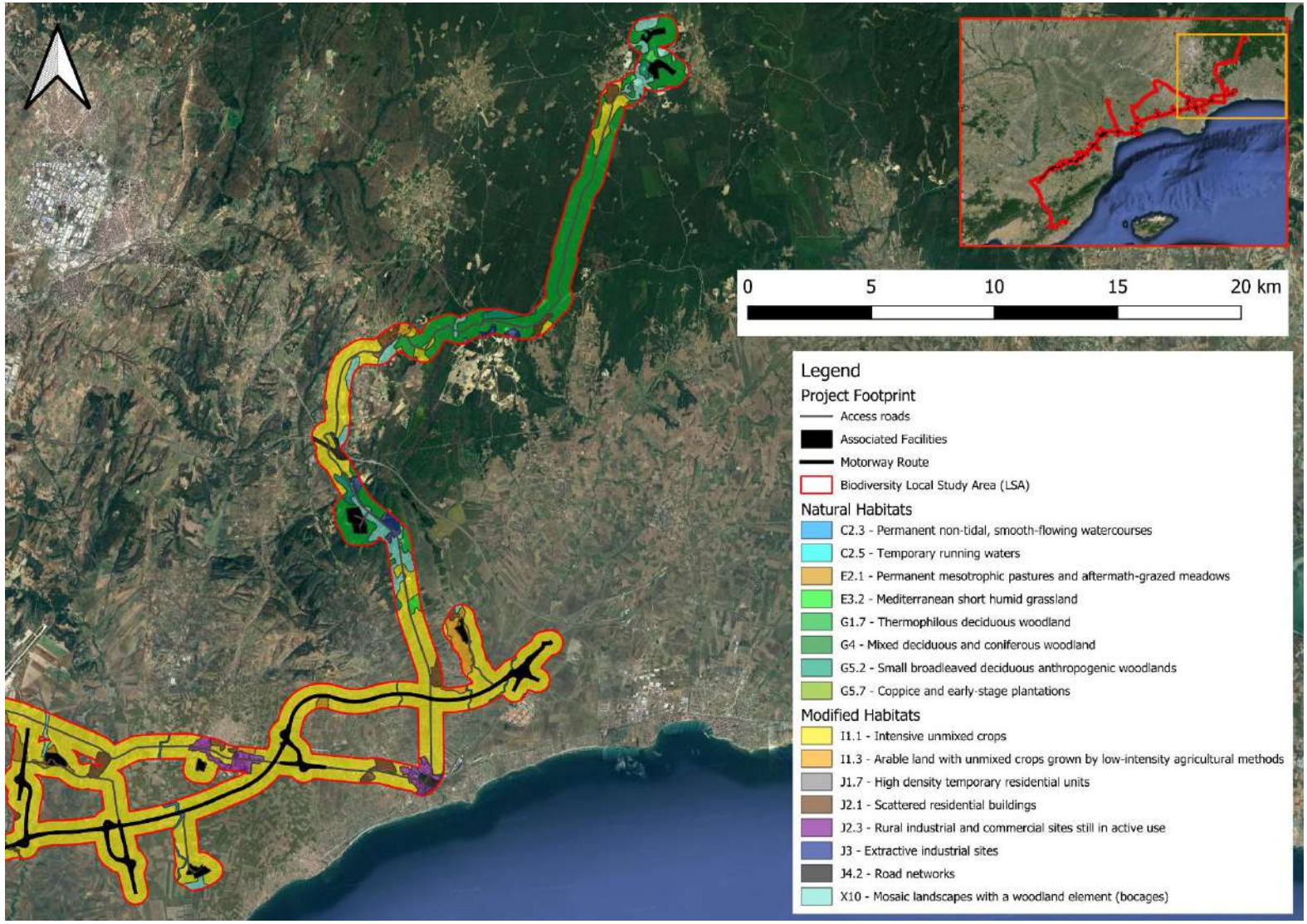



**Figure 75: EUNIS Habitat Map of the Biodiversity LSA (north-eastern section view)**

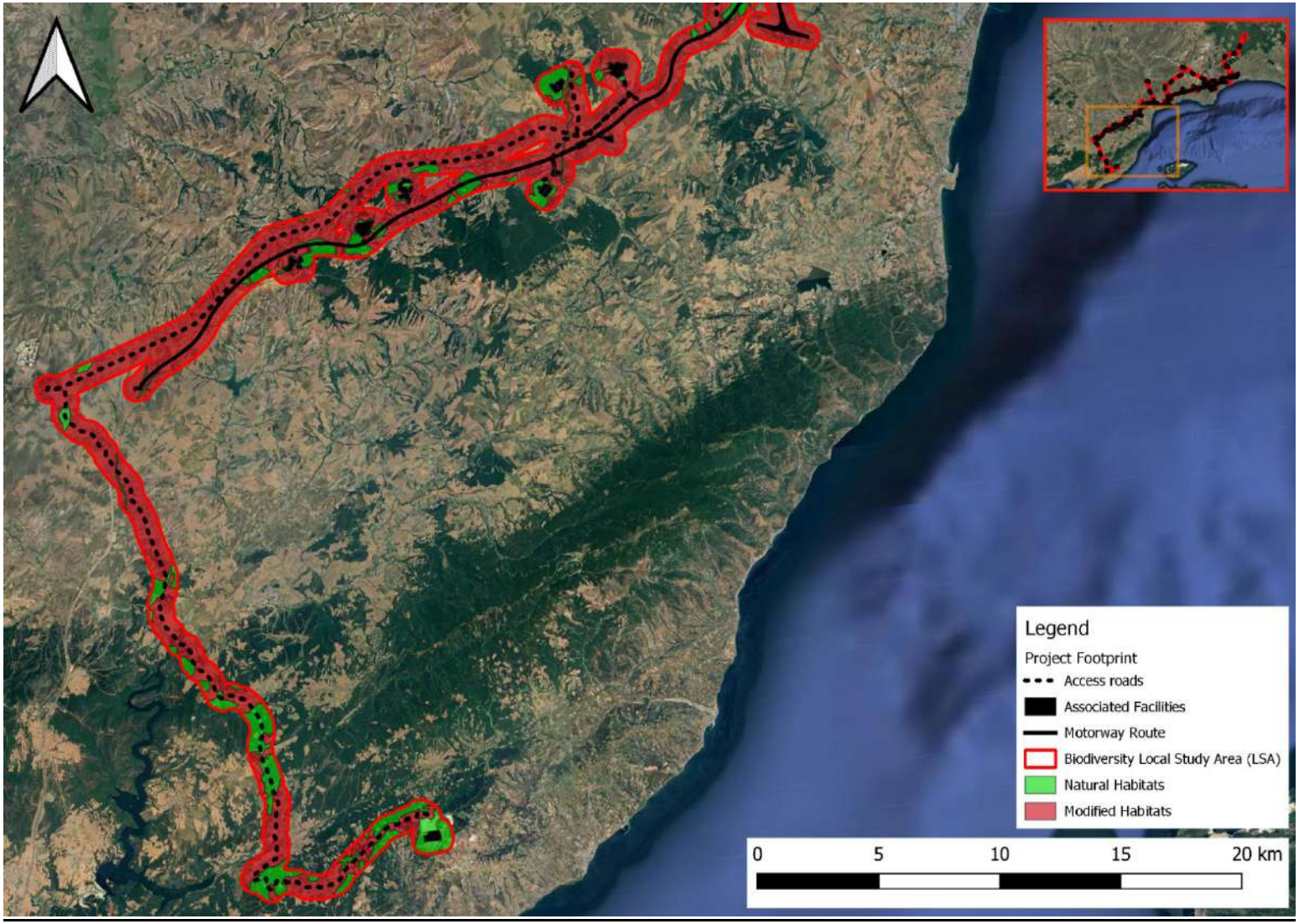



**Figure 76: Distinction of Natural and Modified Habitats inside the Biodiversity LSA (south-western section view)**

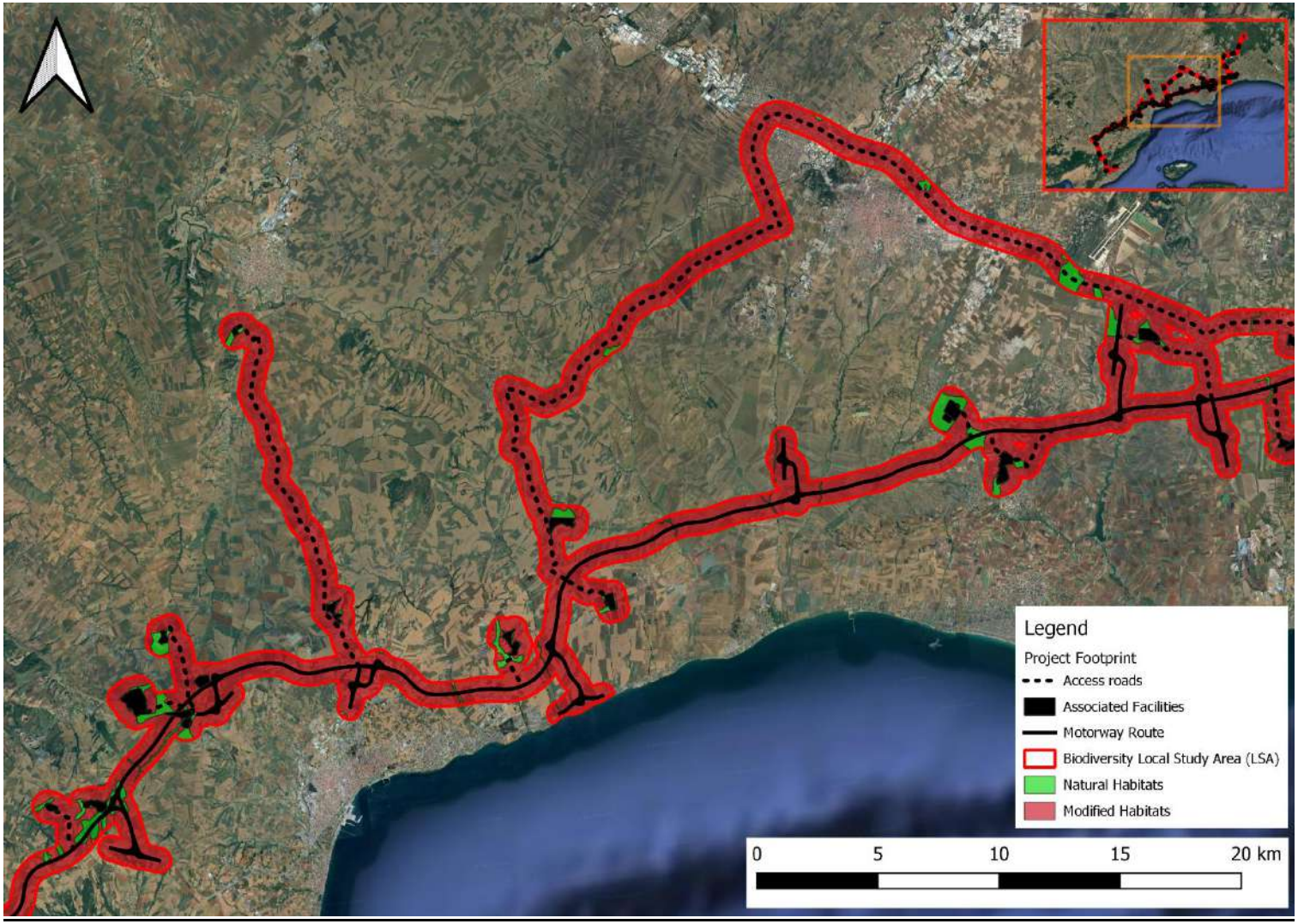



**Figure 77: Distinction of Natural and Modified Habitats inside the Biodiversity LSA (central section view)**

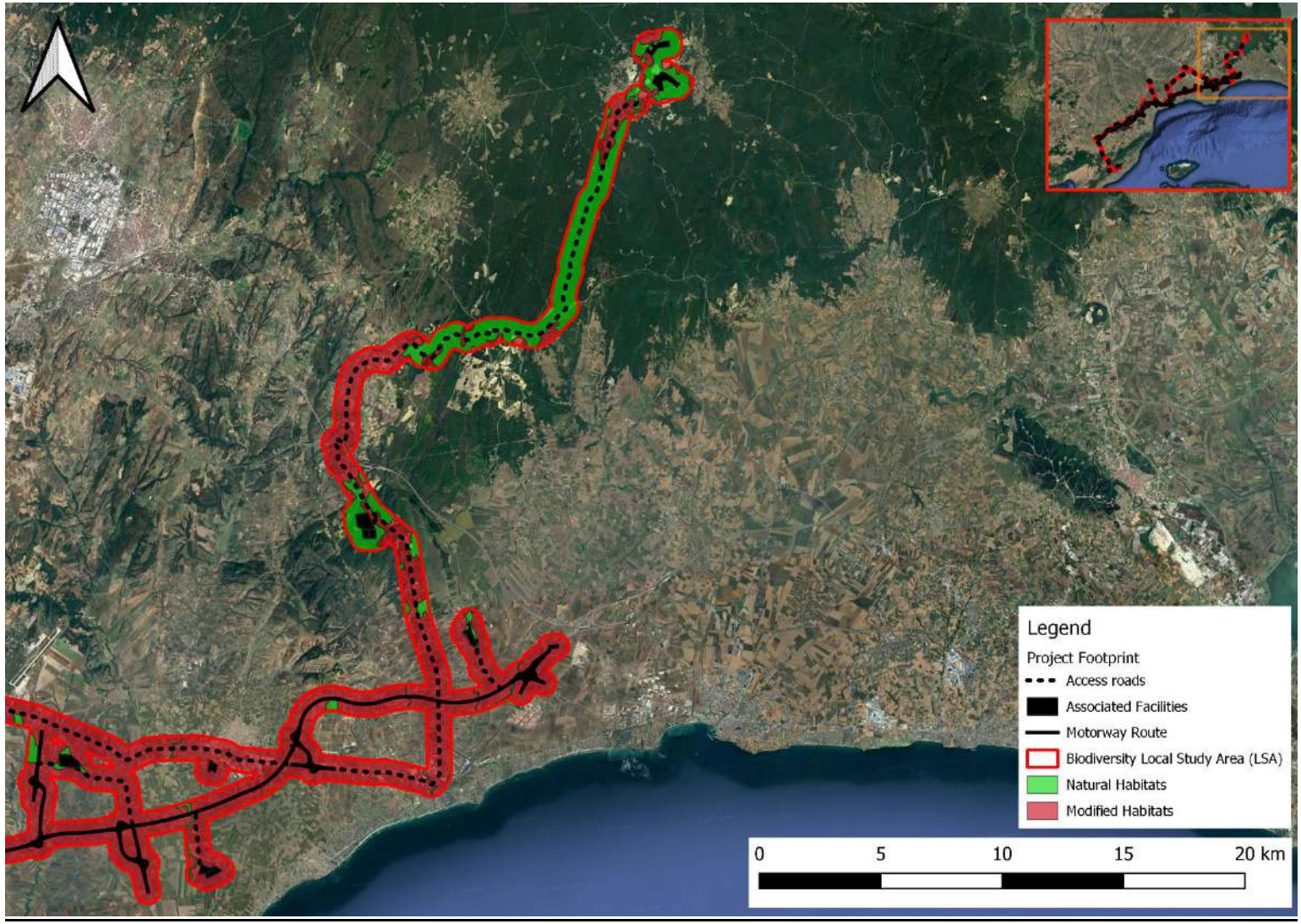



**Figure 78: Distinction of Natural and Modified Habitats inside the Biodiversity LSA (north-eastern section view)**

**C2.3 – Permanent non-tidal, smooth-flowing watercourses**

This habitat type describes permanent water courses with non-turbulent water and their associated animal and microscopic algal pelagic and benthic communities. This type of water courses includes slow-flowing rivers, streams, brooks, rivulets and rills, but also fast-flowing rivers with laminar flow.

In the LSA, this habitat type was identified and mapped mainly in the north-western part. In particular, the permanent watercourses identified during the freshwater surveys within the LSA are the Çorlu Stream, belonging to the Meriç - Ergene Basin, the Mandıra Creek, belonging to the Karaçay Basin, and finally a small stream that runs through the central part of the LSA and then flows into the Sea of Marmara, then included in the Marmara Basin (Figure 79).

The streams and riverbanks are often covered by riparian vegetation, primarily reeds, but also willows and broad-leaved trees.



**Figure 79: Habitat C2.3 - Permanent smooth-flowing watercourse within LSA (freshwater sampling station FW15 on the Mandıra Creek)**

**C2.5 – Temporary running waters**

This habitat type describes watercourses that cease to flow for part of the year, leaving a dry bed or pools. These water bodies are characterized by fluctuations in water level, which includes dry periods, alternating with long periods of running water. They are usually surrounded by riparian vegetation, including trees such as willows and poplars, sometimes dominated by reeds.

In the LSA, most of the streams and rivers crossed by the LSA are considered to be temporary due to their small sub-basins and the Mediterranean climate (Figure 80). Most of the temporary rivers have been mapped within the Marmara Basin, which is also the river basin on which the LSA lies the most. Among the mapped temporary streams are the Kumlubağ Creek, the Kum Creek, the Çayırlar Creek, the Asakal Creek and Kum Creek. Only the Çayırlar Creek and the Asakal Creek are part of the Meriç-Ergene Basin.

These temporary streams are impacted by anthropic pollutions originating from industrial and agricultural activities, sedimentation and erosion (Varol & Tokatli, 2023[108]).



**Figure 80: Habitat C2.5 - Temporary running watercourse within the LSA (freshwater sampling station FW09)**

**E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows**

Lowland and montane mesotrophic and eutrophic pastures and hay meadows were identified along the north-western part of the LSA, mostly close to thermophilous deciduous woodlands (EUNIS code G1.7) as transitional habitat zone between woods and cultivated areas.

This habitat type is regularly grazed, and on well-drained soils with various herbs species such as *Lolium perenne, Cynosurus cristatus, Poa spp., Festuca spp., Trifolium repens, Leontodon autumnalis, Bellis perennis, Ranunculus spp., Cardamine pratensis, Deschampsia cespitosa.*

**E3.2 – Mediterranean short humid grassland**

This habitat type is characterized by very short grasslands of impermeable compact soils or marls, wet for a large part of the year, and desiccated in summer, characteristic of the Mediterranean basin, with irradiations north to the Illyrian zone of the northwestern Balkan peninsula.

In the LSA, this habitat is mainly distributed near watercourses and/or wetlands (Figure 81). The sampling points characterized by the presence of this habitat type are SP2, SP3 and SP7 and the predominant species identified were *Dactylis glomerata, Eryngium campestre, Eryngium creticum* and *Lolium perenne.*

[108] Varol, Memet, and Cem Tokatlı. "Evaluation of the water quality of a highly polluted stream with water quality indices and health risk assessment methods." *Chemosphere* 311 (2023): 137096.



**Figure 81: Habitat E3.2 – Mediterranean short humid grassland within the LSA (flora and habitat sampling station SP07)**

**G1.7 - Thermophilous deciduous woodland**

This habitat includes Forests or woods of submediterranean climate regions and supramediterranean altitudinal levels, and of western Eurasian steppe and substeppe zones (Figure 82). The dominant species are represented by deciduous or semideciduous thermophilous *Quercus* species or by other southern trees such as *Carpinus orientalis*, *Castanea sativa* or *Ostrya carpinifolia*.



**Figure 82: Habitat G1.7 - Thermophilous deciduous woodland within the LSA (flora and habitat sampling station SP13)**

**G4 - Mixed deciduous and coniferous woodland**

Forest and woodland of mixed broad-leaved deciduous or evergreen and coniferous trees of the nemoral, boreal, warm-temperate humid and mediterranean zones. This habitat type is mostly distributed in the boreonemoral transition zone between taiga and temperate lowland deciduous forests, and of the montane level of the major mountain ranges to the south. Neither coniferous, nor broadleaved species account for more than 75% of the crown cover.

**G5.2 - Small broadleaved deciduous anthropogenic woodlands**

Plantations and small intensively managed woods of deciduous broadleaved trees less than about 0.5 ha in area. Evergreen broadleaved species may occur as well; however, they have a lower canopy cover than deciduous species.

**G5.7 - Coppice and early-stage plantations**

Woodland treated as coppice characterized by plantations with a dominant canopy of young trees that are still less than 5 m in height. This habitat type also includes plantations of dwarf trees or shrubs cultivated for wood or small-tree production, with a regular whole-plant harvesting regime, including short-rotation *Salix* beds for biomass production, Christmas tree crops, tree nurseries.

### 6.2.3.3 Terrestrial Flora Species

The terrestrial flora species present within the LSA were determined based on literature review and field survey conducted in June 2022. As already reported in section 6.2.3.2, the extensive experience of the local expert, Prof. Hayri Duman, in the surveyed areas allowed to greatly enhance the reliability of the results deriving from the field survey, still considered the limited number of fieldwork days and sampling points. The previous work of the professor in the monitored areas has provided him with the necessary insights to conduct the survey using a methodology which could take into account the unique characteristics of each site. Furthermore, his prior experience in the regions has been crucial in validating the information obtained from literature analysis. His deep knowledge of the region's flora species has enabled a comprehensive cross-referencing of data, ensuring both accuracy and reliability.

The LSA is located at elevations between 19 m and 147 m within the "PA0404 - Balkan mixed forests" terrestrial ecoregion which is considered part of the broader "Temperate Broadleaf & Mixed Forests" category (Olson *et al.*, 2001[109]). Phytogeographically the area belongs to the Central European, Illyrian and Euxinian provinces of the Circumboreal Region (Zohary, 1973[110]; Davis, 1975[111]; Thomson, 2005[112]). Mixed oak forests are characteristic of this ecoregion vegetation, with *Quercus frainetto* as the dominant tree species. Oak forests are often interspersed with pine, silver fir (*Abies alba*) and Norway spruce (*Picea abies*) forests, woodland-pastures, shrublands and grasslands (Ozenda, 1994[113]). In general, this ecoregion hosts a high diversity of flora and fauna, with a relatively high number of endemic plant species.

According to field studies conducted on June 2022 by the expert botanist Prof. Hayri Duman, a total 41 species were directly observed in the LSA. The complete list of species is available in Appendix D.

Of these species only 1, *Cirsium baytopae* (EN), was identified as threatened and regional endemic. In the absence of a Global IUCN assessment, the species national status was defined by taking into account the threat categories provided in the local assessments (e.g. Red Data Book for Turkish Plants) re-evaluated by the local expert (Prof. Hayri Duman) based on the latest available information on the species distribution and IUCN 2001 criteria.

**Table 73: Flora species of conservation concern within the LSA**

| Family | Species | IUCN Global Status | National IUCN Status | End./RR | Station Code | Lit./Obs. |
|---|---|---|---|---|---|---|
| Asteraceae | *Cirsium baytopae* | - | EN | Regional Endemic | SP08, SP09, SP10, SP11, SP12, SP15 | O 2022 |

### 6.2.3.4 Freshwater Fish Species

The freshwater fauna species present within the LSA were determined based on literature review and field surveys conducted in June 2022 and in January 2023. The extensive experience of the local expert Prof. Aydın

[109] Olson, D. M., Dinerstein, E., Wikramanayake, E. D., Burgess, N. D., Powell, G. V. N., Underwood, E. C., D'Amico, J. A., Itoua, I., Strand, H. E., Morrison, J. C., Loucks, C. J., Allnutt, T. F., Ricketts, T. H., Kura, Y., Lamoreux, J. F., Wettengel, W. W., Hedao, P., Kassem, K. R. 2001. Terrestrial ecoregions of the world: a new map of life on Earth. Bioscience 51(11):933-938

[110] Zohary, M. (1973) Geobotanical foundations of the Middle East, 2 vols. Gustav Fischer Verlag, Stuttgart.

[111] Davis, P.H. (ed.). (1965-1988). Flora of Turkey and the East Aegean Islands, vol. 1-10, Edinburgh Univ. Press: Edinburgh.

[112] Thompson, J.D. (2005). Plant evolution in the Mediterranean. Oxford, Oxford University Press.

[113] Ozenda, P. (1994). Végétation du continent européen. Delachaux et Niestlé.

Akbulut in the surveyed areas allowed to enhance the reliability of the results deriving from the conducted field survey and to limit the knowledge gaps potentially due to the limited number of fieldwork days and sampling points. Prof. Akbulut's previous work in the regions provided him with the necessary insights to conduct the survey using a methodology tailored to the unique characteristics of each monitored watercourse section. Additionally, his prior experience in the surveyed temporary and permanent watercourses was crucial in validating the information obtained from literature analysis. His knowledge of the region's freshwater vertebrate fauna enabled comprehensive cross-referencing of data, ensuring both accuracy and reliability.

According to literature review and field surveys, 62 fish species were identified as present or potentially present within the freshwater LSA. Five of these species were sampled during the electrofishing survey.

The complete species list is reported in the Appendix D, while in Table 74 a list including the species of conservation interest, the alien species potentially present and the species classified as NT and DD is reported.

Based on the Global IUCN Red List, *Acipenser gueldenstaedtii*, *Acipenser stellatus* and *Anguilla anguilla* are classified as Critically Endangered (CR), while no other threatened species and endemism were identified. The species *Chondrostoma vardarense* is classified as Near Threatened (NT), while the species *Vimba melanops* is classified as Data Deficient (DD). The sampled *Gambusia holbrooki* and the potentially present *Cyprinus carpio*, *Morone saxatilis* and *Salmo trutta* are alien species.

It is important to remember that the distribution of the two species *Acipenser gueldenstaedtii* and *Acipenser stellatus* is limited to lower reaches of the Karaçay Basin which is part of the "418 - Dniester - Lower Danube" freshwater ecoregion and drains in the Black Sea.

**Table 74: List of fish species potentially present within the LSA, including species of conservation interest, alien species and species classified as NT or DD**

| Family | Species | IUCN Global Status | End./RR | Obs./Lit. |
|---|---|---|---|---|
| Acipenseridae | *Acipenser gueldenstaedtii* | CR | - | L |
| Acipenseridae | *Acipenser stellatus* | CR | - | L |
| Anguillidae | *Anguilla anguilla* | CR | - | L |
| Cyprinidae | *Chondrostoma vardarense* | NT | - | L |
| Cyprinidae | *Cyprinus carpio* | Alien | - | L |
| Leuciscidae | *Vimba melanops* | DD | - | L |
| Moronidae | *Morone saxatilis* | Alien | - | L |
| Poeciliidae | *Gambusia holbrooki* | Alien | - | O 2022 |
| Salmonidae | *Salmo trutta* | Alien | - | L |

The beds of the streams crossed by the LSA are mainly characterized by sand, clay or silt but, in some cases, a proportion of gravel was also observed. These are mainly temporary watercourses (EUNIS habitat code C2.5) that dry up during the summer. The riparian vegetation observed along the banks of the surveyed areas is often well developed, mainly represented by willows and poplar associated with a lower vegetation layer

characterized by dense shrubs and reeds. Only at stations FW05 and FW04 the riparian vegetation consists exclusively of reeds. Pollution (e.g. domestic, agricultural and industrial wastewater), the presence of treatment plants, sedimentation and draws water for agricultural irrigation are the main disturbance affecting these streams and the fish presence.

Fish species were found only at four (FW02, FW09, FW12 and FW15) locations out of 16 stations surveyed. At five stations during the June 2022 surveys (FW01, FW03, FW05, FW08 and FW10) the streams were dry, while at FW7 the water level of the stream was very low. Also, very little water flow was observed at six stations (FW02, FW04, FW07, FW09, FW11 and FW14) during the sampling period of January 2023, consequently it is assumed that these are seasonal streams.

At stations FW06 and FW04 the water quality observed was very poor, mainly due to the discharge of agricultural and industrial wastewater. For example, at station FW06 most of the water flowing in the stream probably came from a treatment plant in the Çorlu district, located 2 km upstream. At stations FW13 and FW16 the water quality was very poor and quite polluted also in terms of odors mainly because both stations are located downstream to a Treatment plant. Specifically, station FW13 is approximately 7 km downstream of a treatment plant whose water is then poured into the Marmara Sea, while FW16 is located on the Çorlu Stream and approximately 2 km downstream of the Çorlu Treatment Plant. Also, at station FW04 the water quality was very poor, it presented a quite sharp smell, a dark color and swamp gases from the sediments were observed. No fish species were sampled at these stations.

Table 75 includes a list of the fish species directly observed during surveys conducted in 2022 and then in January 2023, with relative sampling stations (FWs) and number of individuals detected.

*Carassius gibelio* (about 280 individuals) seems to be the dominant fish species, followed by *Cobitis strumicae* (50 individuals), the alien species *Gambusia holbrooki* (30 individuals), *Squalius orpheus* (15), *Alburnoides bipunctatus* (13), *Gobio bulgaricus* (12 individuals), *Alburnus alburnus* (10 individuals) and *Petroleuciscus borysthenicus* (8 individuals). *Cobitis strumicae* together with *Gobio bulgaricus* were contacted at both stations FW02 and FW09, while *Alburnus alburnus* at both FW09 and FW12.

**Table 75: Fish species observed during the survey conducted in 2022 and January 2023**

| Family | Species | Global IUCN Red List | End./RR | Station Code | N. ind. | Obs./Lit. |
|---|---|---|---|---|---|---|
| Cyprinidae | *Carassius gibelio* | NE | - | FW12 | 280 | O 2023 |
| Cobitidae | *Cobitis strumicae* | LC | - | FW02, FW09 | 50 | O 2022-2023 |
| Gobionidae | *Gobio bulgaricus* | LC | - | FW02, FW09 | 12 | O 2022 |
| Leuciscidae | *Alburnus alburnus* | LC | - | FW09, FW12 | 10 | O 2022-2023 |
| Leuciscidae | *Alburnoides bipunctatus* | NE | - | FW15 | 13 | O 2023 |
| Leuciscidae | *Petroleuciscus borysthenicus* | LC | - | FW02 | 8 | O 2022 |

| Family | Species | Global IUCN Red List | End./RR | Station Code | N. ind. | Obs./Lit. |
|---|---|---|---|---|---|---|
| Leuciscidae | *Squalius orpheus* | LC | - | FW12 | 15 | O 2023 |
| Poeciliidae | *Gambusia holbrooki* | Alien | - | FW02 | 30 | O 2022-2023 |

### 6.2.3.5 Terrestrial Fauna Species

The terrestrial fauna species present within the LSA were determined based on literature review and field surveys conducted in June 2022. The extensive experience of the local expert Prof. Safak Bulut in the surveyed areas allowed to enhance the reliability of the results deriving from the conducted field survey and to limit the knowledge gaps potentially due to the limited number of fieldwork days and sampling points. Prof. Bulut's previous work in the regions provided him with the necessary insights to conduct the survey using a cost-effective methodology capable of maximizing the detectability of fauna species belonging to different taxonomic groups. Additionally, his prior experience in the surveyed temporary and permanent watercourses was crucial in validating the information obtained from literature analysis. His knowledge of the region's terrestrial fauna enabled comprehensive cross-referencing of data, ensuring both accuracy and reliability.

The fauna species observed or potentially present within the LSA include 294 vertebrate species of which 9 amphibian, 29 reptiles, 58 mammals, of which 21 bats, and 198 birds. The species directly observed during filed surveys in June 2022 are only 34.

Among the fauna species identified as present or potentially present within the LSA three bird species (*Aquila nipalensis*, *Neophron percnopterus*, *Falco cherrug)* and one mammal species (*Spermophilus citellus*, respectively) are classified as Endangered (EN). Four bird species (*Aquila heliacal*, *Clanga clanga*, *Streptopelia turtur* and *Falco vespertinus*), five mammal species (*Miniopterus schreibersii*, *Myomimus roachi*, *Myotis capaccinii, Rhinolophus mehelyi* and *Vormela peregusna*) and one reptile species (*Testudo graeca*) are classified as Vulnerable (VU). One potentially present mammal species (*Nannospalax leucodon*) is classified as Data Deficient (DD).

Among the fauna species present or potentially present within the LSA, one alien reptile species (*Podarcis siculus*) and two alien bird species (*Phasianus colchicus* and *Alexandrinus krameri*) were identified.

Finally, for the terrestrial fauna component no endemic or/and restricted range species were identified.

#### 6.2.3.5.1 Amphibian Species

According to literature review and field studies carried out in June 2022, 9 amphibian species were identified as present or potentially present within the freshwater LSA. Only *Bufo bufo* was listed as present and directly observed within the LSA. It was encountered at station FP04. The complete species list is reported in Table 76 below.

None of the listed species is included in a threatened category according to the Global IUCN Red List and they are all classified as Least Concern (LC).

Therefore, no endemism as well as species of conservation concern have been identified within the LSA.

**Table 76: Amphibian species present or potentially present within the LSA**

| Order | Species | IUCN Global Status | End./RR | Station Code | Obs./Lit. |
|---|---|---|---|---|---|
| Anura | *Bombina bombina* | LC | - | - | L |
| Anura | *Bufo bufo* | LC | - | FP04 | O 2022 |
| Anura | *Bufotes viridis* | LC | - | - | L |
| Anura | *Hyla orientalis* | LC | - | - | L |
| Anura | *Pelobates syriacus* | LC | - | - | L |
| Anura | *Pelophylax ridibundus* | LC | - | - | L |
| Anura | *Rana dalmatina* | LC | - | - | L |
| Urodela | *Lissotriton vulgaris* | LC | - | - | L |
| Urodela | *Triturus karelinii* | LC | - | - | L |

#### 6.2.3.5.2 Reptile Species

According to literature review and field surveys carried out in June 2022, 29 reptile species were identified as present or potentially present within the LSA. The species directly observed during field surveys are only five.

Only one species (*Testudo graeca*) is listed in a threatened category according to the Global IUCN Red List and classified as Vulnerable (VU), while *Testudo hermanni* and *Emys orbicularis* are classified as Near Threatened (NT) and all the remaining species as Least Concern (LC). The potentially present *Podarcis siculus* is an alien species. A large population of *Ophisops elegans* was observed at FP05.

No endemisms have been identified.

The complete species list is reported in Appendix D, while in Table 77 below a list including the species of conservation concern, the alien species potentially present and the species observed in 2022 with relative sampling stations (FPs and SPs) is reported.

**Table 77: Reptile species potentially present within the LSA, including species of conservation interest, alien species and species classified as NT**

| Family | Species | IUCN Global Status | End./RR | Station Code | Obs./Lit. |
|---|---|---|---|---|---|
| Emydidae | *Emys orbicularis* | NT | - | - | L |
| Lacertidae | *Podarcis siculus* | Alien | - | - | L |
| Testudinidae | *Testudo graeca* | VU | - | FP02 | O 2022 |
| Testudinidae | *Testudo hermanni* | NT | - | SP15 | O 2022 |

#### 6.2.3.5.3 Bird Species

A total of 198 bird species have been identified as present or potentially present within the LSA and its vicinity. Among them, the species directly observed during field studies in June 2022 are only 20.

According to the Global IUCN Red List, 3 species (*Aquila nipalensis*, *Falco cherrug* and *Neophron percnopterus*) are classified as Endangered (EN), 4 species (*Aquila heliaca*, *Clanga clanga*, *Falco vespertinus* and *Streptopelia turtur*) are classified as Vulnerable (VU) and 9 species (*Circus macrourus*, *Gallinago media*, *Haematopus ostralegus*, *Lanius senator*, *Limosa limosa*, *Numenius arquata*, *Pelecanus crispus*, *Turdus iliacus* and *Vanellus vanellus*) are classified as Near Threatened (NT).

According to literature review, two alien species (*Alexandrinus krameri* and *Phasianus colchicus*) were identified as potentially present within the LSA and its vicinity.

All the remaining species are classified as Least Concern (LC). No endemic species have been identified.

The list of bird species also includes, on the literature basis, many species that are only passage for the LSA extension due mainly to the lack of suitable feeding, breeding and wintering habitats.

Bird identified species of conservation interest, alien species potentially present and species classified as NT are reported in Table 78 below, while the complete list of the bird species is reported in Appendix D.

**Table 78: Bird species identified as potentially present within the LSA, including species of conservation interest, alien species and species classified as NT**

| Order | Species | IUCN Global Status | Phenology | Obs./Lit. |
|---|---|---|---|---|
| Accipitriformes | *Aquila heliaca* | VU | Passage | L |
| Accipitriformes | *Aquila nipalensis* | EN | Passage | L |
| Accipitriformes | *Circus macrourus* | NT | Passage | L |
| Accipitriformes | *Clanga clanga* | VU | Passage | L |
| Accipitriformes | *Neophron percnopterus* | EN | Passage | L |
| Charadriiformes | *Vanellus vanellus* | NT | Non-breeding | L |
| Columbiformes | *Streptopelia turtur* | VU | Breeding | L |
| Falconiformes | *Falco cherrug* | EN | Passage | L |
| Falconiformes | *Falco vespertinus* | VU | Passage | L |
| Charadriiformes | *Haematopus ostralegus* | NT | Passage | L |
| Passeriformes | *Lanius senator* | NT | Breeding | L |
| Pelecaniformes | *Pelecanus crispus* | NT | Passage | L |
| Galliformes | *Phasianus colchicus* | Alien | Resident | L |

| Order | Species | IUCN Global Status | Phenology | Obs./Lit. |
|---|---|---|---|---|
| Psittaciformes | *Alexandrinus krameri* | Alien | Resident | L |
| Charadriiformes | *Gallinago media* | NT | Passage | L |
| Charadriiformes | *Limosa limosa* | NT | Non-breeding/passage | L |
| Charadriiformes | *Numenius arquata* | NT | Non-breeding | L |
| Passeriformes | *Turdus iliacus* | NT | Non-breeding | L |

#### 6.2.3.5.4 Mammal Species

According to literature review and survey studies carried out in June 2022, 58 species were determined as present or potentially present in the LSA, of which 21 species of bats. The presence of only 8 species was confirmed based on signs of presence or direct observations.

According to the Global IUCN Red List, 5 species potentially present (*Miniopterus schreibersii*, *Myomimus roachi*, *Myotis capaccinii*, *Rhinolophus mehelyi*, and *Vormela peregusna*) are classified as Vulnerable (VU). In addition, *Nannospalax leucodon* is classified as Data Deficient (DD), 4 species (*Barbastella barbastellus*, *Lutra lutra*, *Myotis bechsteinii* and *Rhinolophus euryale*) are classified as Near Threatened (NT) and *Spermophilus citellus* is classified as Endangered (EN). All remaining species are classified as Least Concern (LC). No endemic or/and restricted range species have been identified.

Although a specific survey was organized in June 2022, it was not possible to confirm the presence of *Spermophilus citellus* within the LSA, as no direct and/or indirect signs of its presence were observed within the LSA during the June 2022 surveys.

**Table 79: Mammal species of conservation concern and species classified as NT or DD potentially present within the LSA**

| Family | Species | IUCN Global Status | End./RR | Obs./Lit. |
|---|---|---|---|---|
| Gliridae | *Myomimus roachi* | VU | - | L |
| Miniopteridae | *Miniopterus schreibersii* | VU | - | L |
| Mustelidae | *Lutra lutra* | NT | - | L |
| Mustelidae | *Vormela peregusna* | VU | - | L |
| Rhinolophidae | *Rhinolophus euryale* | NT | - | L |
| Rhinolophidae | *Rhinolophus mehelyi* | VU | - | L |
| Sciuridae | *Spermophilus citellus* | EN | - | L |

| Family | Species | IUCN Global Status | End./RR | Obs./Lit. |
|---|---|---|---|---|
| Spalacidae | *Nannospalax leucodon* | DD | - | O 2022 |
| Vespertilionidae | *Barbastella barbastellus* | NT | - | L |
| Vespertilionidae | *Myotis bechsteinii* | NT | - | L |
| Vespertilionidae | *Myotis capaccinii* | VU | - | L |

### 6.2.4 Critical Habitat Assessment

A screening based on available information was conducted to identify the potential presence of Critical Habitats (CHs) within the LSA according to IFC Performance Standard 6 (PS6).

#### *6.2.4.1 Criterion 1: Habitat of Significant Importance to Critically Endangered and/or Endangered Species*

The presence of species having Endangered (EN) or Critically Endangered (CR) conservation status according to global IUCN criteria was considered. In the absence of a Global IUCN assessment (e.g. Not Evaluated NE, or Data Deficient DD), the threat categories provided in the local assessments (e.g. Red Data Book for Turkish Plants) were taken into account and re-evaluated by the local expert (Prof. Hayri Duman) considering the latest available information on the species distribution and IUCN 2001 criteria.

As a result, 5 species were identified as potentially triggering CH based on this criterion. This species include:

- 1 flora species:
  - *Cirsium baytopae* (EN, Restricted Range);
- 3 fish species:
  - *Acipenser gueldenstaedtii* (CR);
  - *Acipenser stellatus* (CR);
  - *Anguilla anguilla* (CR);
- 1 mammal species:
  - *Spermophilus citellus* (EN).

Of the above species only the flora species was observed within the LSA during field studies. The fish and mammal species are considered to be potentially present based only on literature review.

Other two species of birds, *Aquila nipalensis* (EN) and *Neophron percnopterus* (EN), were excluded from the assessment since they are considered only passage species in the LSA.

In order to assess the importance of the LSA for the selected species, the following thresholds were applied (Guidance Note 6, GN72, IFC 2019):

a) areas that support globally important concentrations of an IUCN Red-listed EN or CR species (> 0.5% of the global population AND >5 reproductive units of a CR or EN species);

b) areas that support globally important concentrations of an IUCN Red-listed VU species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN70(a);

c) as appropriate, areas containing nationally/regionally important concentrations of an IUCN Red-listed EN or CR species.

The Criterion 1a thresholds were applied on all fauna and flora species having EN or CR conservation status according to global IUCN criteria or local assessments.

All the Vulnerable species listed as potentially present have a very wide distribution range, therefore it is excluded that they could meet the thresholds for Criterion 1b:“Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN72”.

No areas containing nationally/regionally important concentrations of an IUCN Red-listed EN or CR species was identified within or around the study area, therefore criterion 1c was not applied.

In order to determine the presence of Critical Habitat, an “Ecologically Appropriate Area of Analysis” (EAAA) has been identified for each species, taking into account the species distribution (within and sometimes extending beyond the Project’s Area of Influence) and the ecological patterns, processes, features, and functions that are necessary for maintaining it. The boundaries of the species-specific EAAA may include catchments, large rivers, or geological features. The defined EAAAs should be functional in assessing the applicability of Critical Habitat criteria and thresholds.

For the potentially triggering Critical Habitat flora species *Cirsium baytopae*, since no clear geographical boundaries of the species distribution were available from literature (in particular from IUCN Global Red List database), the EAAA was firstly defined as corresponding to the total extension of “(1c) Ergene Bölümü” floristic biogeographic ecoregion, according to the biogeographic ecoregion mapping presented in Bizimbitkiler website[114]. Indeed, according to the information presented by Bizimbitkiler, *Cirsium baytopae* results to be present in the two floristic biogeographic ecoregions of “(1c) Ergene Bölümü” and “(1a) Istranca Bölümü”, but the Project footprint entirely falls within “(1c) Ergene Bölümü” ecoregion, therefore only this was considered. Finally, the boundaries of the initially defined EAAA were slightly modified according to the ecological requirements of the species and based on photointerpretation. The defined EAAA has an extension of 17,391 $km^2$ (Figure 83).

For the two potentially triggering Critical Habitat fish species *Acipenser gueldenstaedtii* and *Acipenser stellatus* the global species distributions are known from literature (IUCN Global Red List database) and are much larger than the Project LSA. Therefore, the EAAA was defined as corresponding to Karaçay Basin, which is the only river basin where the species are known as present and falling within the Project LSA. Karaçay Basin corresponds to the lower part of “418 - Dniester - Lower Danube” freshwater ecoregion[115]. The defined EAAA (Figure 84) has an extension of 757 $km^2$.

For the potentially triggering Critical Habitat fish species *Anguilla anguilla* the global species distribution is known from literature (IUCN Global Red List database) and is much larger than the Project LSA. Therefore, the EAAA was defined as corresponding to Meriç Ergene Basin and Marmara Basin, which are the only river basins where the species is known as present and falling within the Project LSA. The defined EAAA (Figure 85) has an extension of 16,662 $km^2$.

[114] Bizimbitkiler – Source: https://bizimbitkiler.org.tr/yeni/demos/technical/

[115] Abell, Robin, *et al*. "Freshwater ecoregions of the world: a new map of biogeographic units for freshwater biodiversity conservation." BioScience 58.5 (2008): 403-414.

For the potentially triggering Critical Habitat mammal species *Spermophilus citellus* the global species distribution is known from literature (IUCN Global Red List database) and is much larger than the Project LSA. Therefore, the EAAA was defined by considering only the lower range of the species distribution, surrounding the Project LSA and limited to the boundaries of all the internationally recognised important for biodiversity areas located in relative proximity to the Project LSA: Terkos Basin KBA, Saros Bay KBA, Meriç Delta KBA and Sırpsındığı KBA. The defined EAAA (Figure 86) has an extension of 23,642 km$^2$.

The results of the critical habitat assessment for Criterion 1 are detailed in Table 80. Species that could trigger critical habitats but that are considered only potentially present based on literature information and/or species for which insufficient data are available are identified as triggering “Potential Critical Habitat”. Where the critical habitat has been confirmed in at least one occasion it is identified as “Critical Habitat”.

The ecology of species screened as triggering CH is described in detail in section 6.2.5.

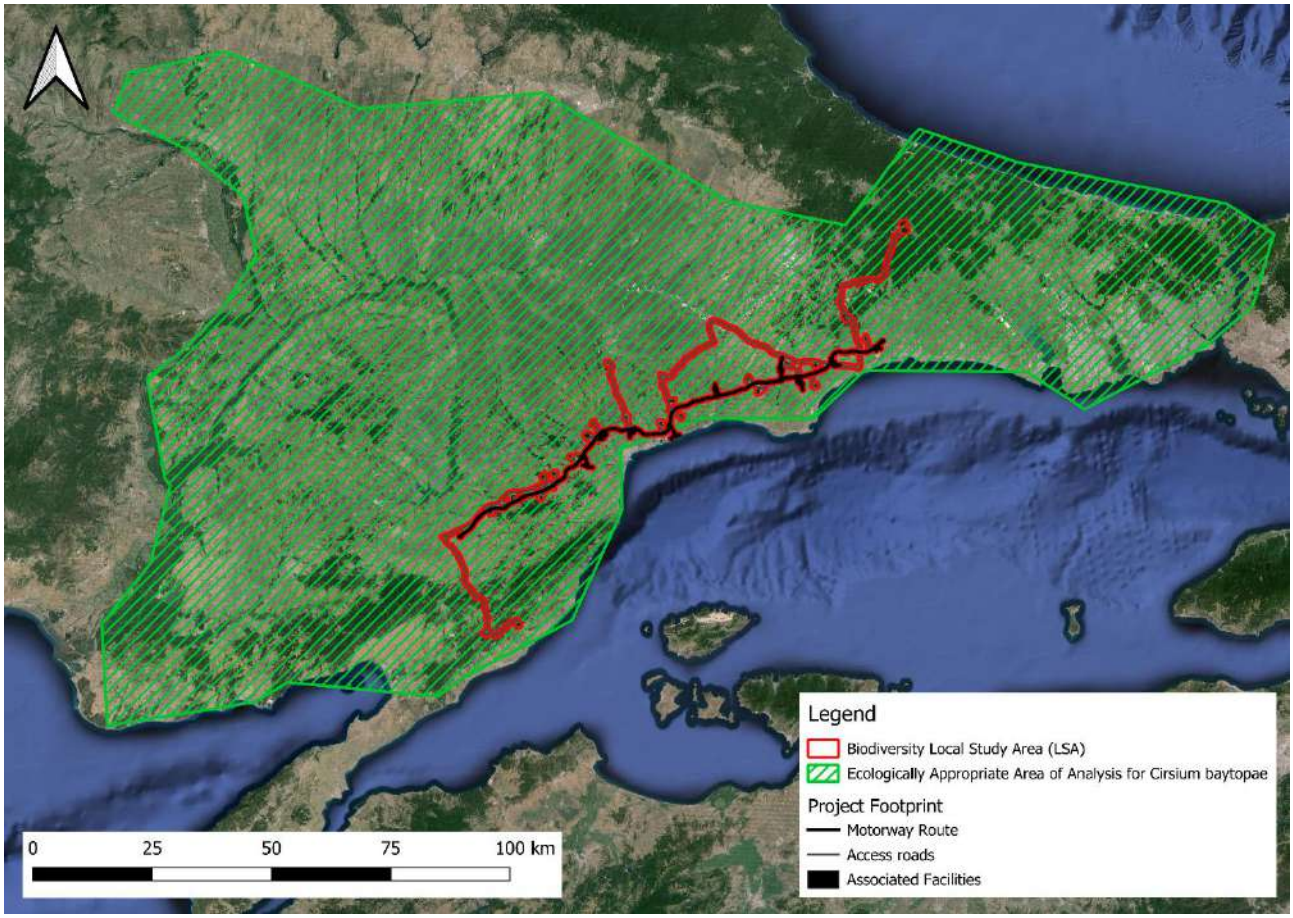



**Figure 83: Ecologically Appropriate Area of Analysis (EAAA) for Cirsium baytopae (source: http://www.bizimbitkiler.org.tr/)**

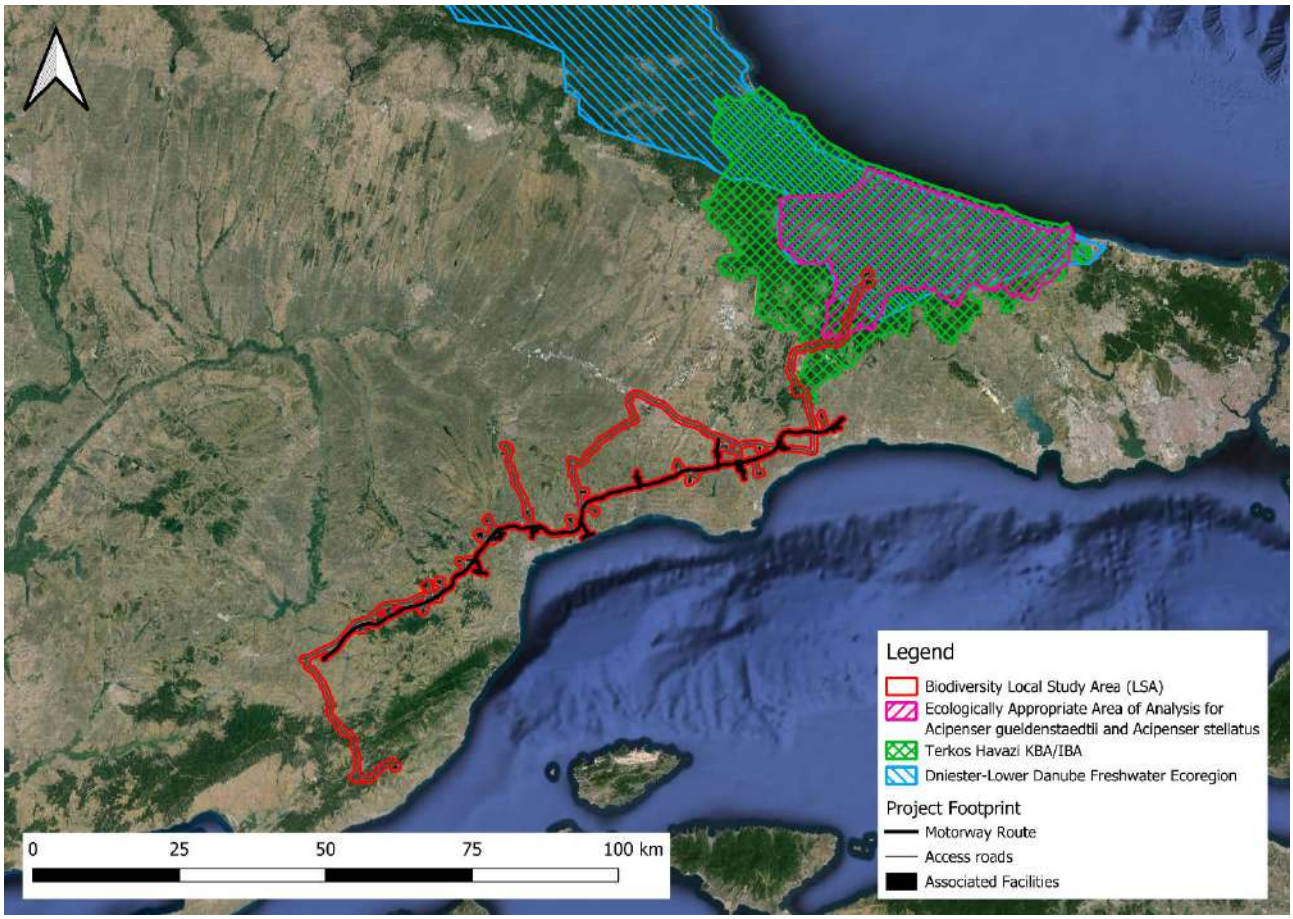



**Figure 84: Ecologically Appropriate Area of Analysis (EAAA) for Acipenser gueldenstaedtii and Acipenser stellatus**

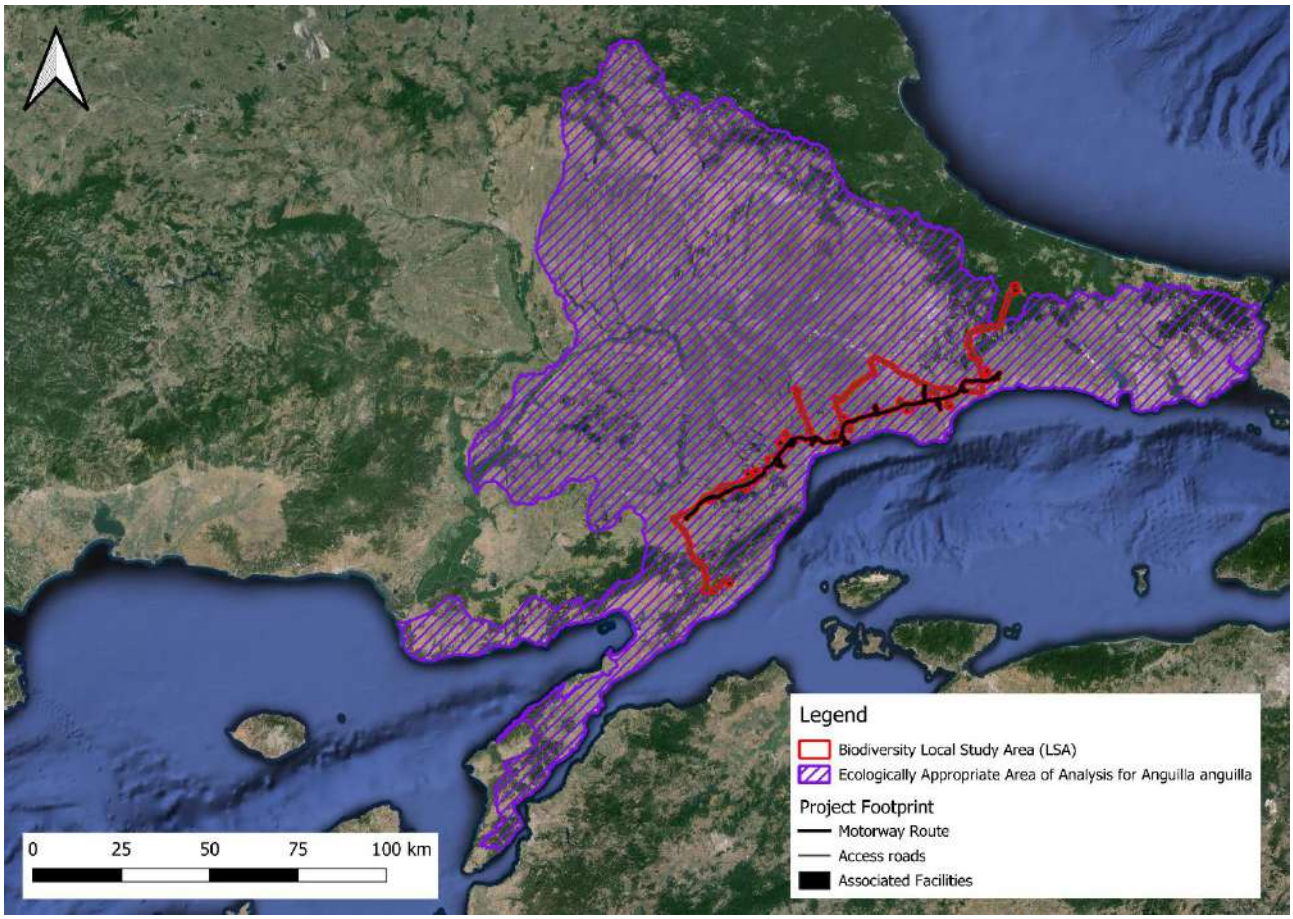



**Figure 85: Ecologically Appropriate Area of Analysis (EAAA) for Anguilla anguilla**

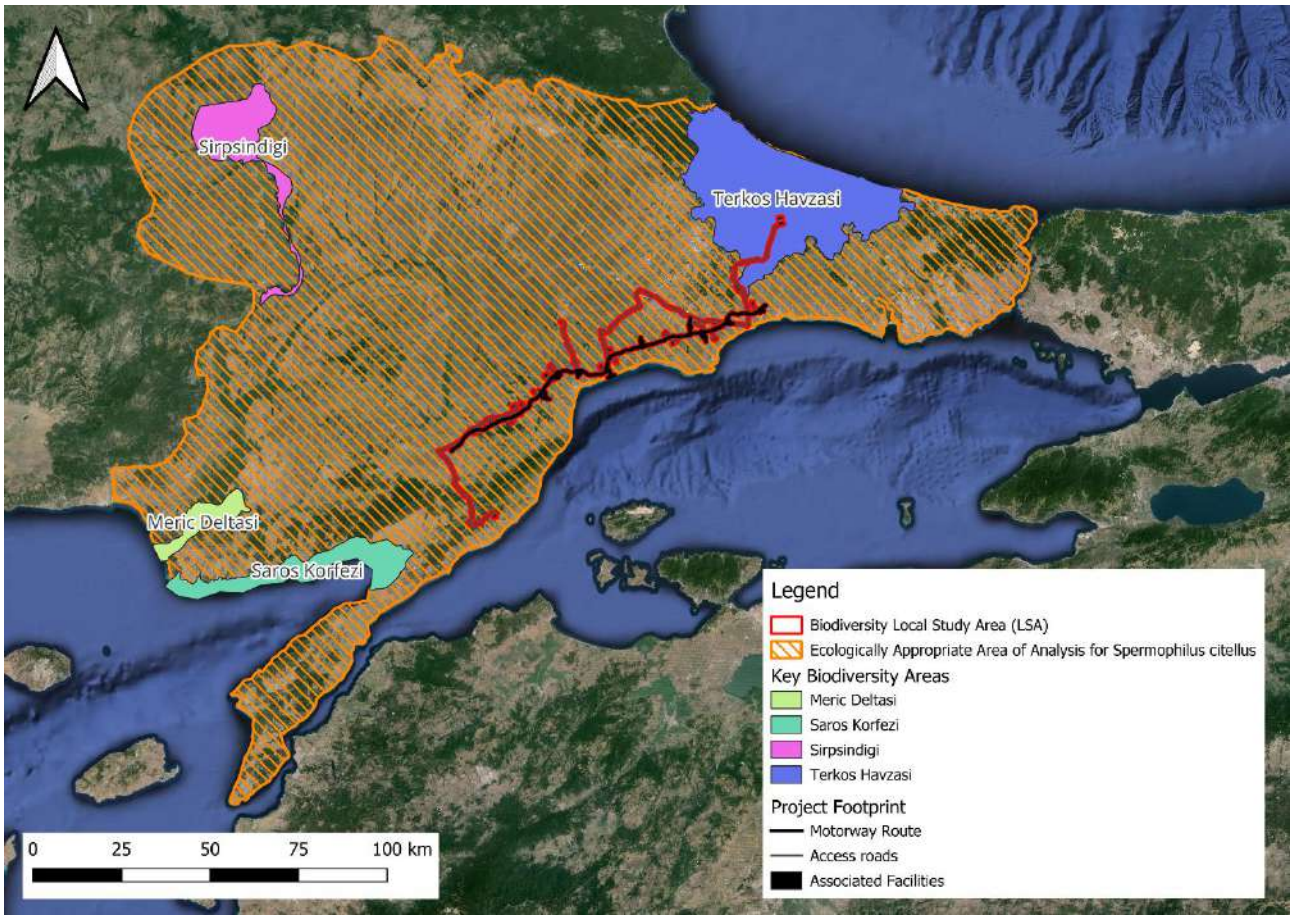



**Figure 86: Ecologically Appropriate Area of Analysis (EAAA) for Spermophilus citellus**

**Table 80: Screening of flora and fauna species potentially triggering Critical Habitat according to Criterion 1 (IFC, 2019)**

| Taxon | Species | Common name | IUCN Red List | Local IUCN | Endemic/RR | Lit./ Obs. | EOO ($km^2$) | 0.5% of EOO ($km^2$) | EAAA ($km^2$) | EAAA is ≥ 0.5% of EOO | Critical Habitat |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Flora | *Cirsium baytopae* | - | NE | EN | Endemic/RR | O | 22,927 | 115 | 17,391 | Yes | CH |
| Fish | *Acipenser gueldenstaedtii* | Russian Sturgeon | CR | - | - | L | 1,135,551 | 5,678 | 757 | No | - |
| Fish | *Acipenser stellatus* | Stellate Sturgeon | CR | - | - | L | 805,101 | 4,025 | 757 | No | - |
| Fish | *Anguilla anguilla* | European eel | CR | - | - | L | 12,102,844 | 60,514 | 16,640 | No | - |
| Mammal | *Spermophilus citellus* | European Souslik | EN | - | - | L | 431,963 | 2,160 | 20,873 | Yes | PCH |

#### 6.2.4.2 Criterion 2: Habitats of Significant Importance to Endemic or Geographically Restricted Species

The presence of endemic or restricted-range species (EOO less than 50,000 km$^2$ for terrestrial vertebrates and plants; global range of less than or equal to 500 km linear geographic span for coastal, riverine, and other aquatic species that do not exceed 200 km width at any point) was considered.

As a result, one species was identified as potentially triggering CH based on this criterion. These species include:

- 1 flora species:
  - *Cirsium baytopae* (EN, Restricted Range).

The above species was observed within the LSA during field studies.

To assess the importance of the LSA for this species, the following threshold was applied (Guidance Note 6, GN75, IFC 2019):

a) areas that regularly hold ≥10% of the global population size AND ≥ 10 reproductive units of a species.

An "Ecologically Appropriate Area of Analysis" has been identified for flora, fish species and mammal species to apply the threshold identified in criterion 2a:

- for flora species: in absence of clear geographical boundaries, the EAAA is identified to determine the presence of a critical habitat for flora species. The EAAA was conservatively defined based on the flora biogeographic ecoregion in which the Project fells "(1c) Ergene Division" corresponding to 17,391 km$^2$.

Species that could trigger critical habitats but that are considered only potentially present based on literature information and/or species for which not sufficient data are available are identified as triggering "Potential Critical Habitat". Where the critical habitat has been confirmed in at least one occasion it is identified as "Critical Habitat" and mapped.

In order to apply the threshold identified in criterion 2, an "Ecologically Appropriate Area of Analysis" (EAAA) was identified to determine the presence of a critical habitat for flora species. As explained in section 6.2.4.1, the defined EAAA for *Cirsium baytopae* has an extension of 17,391 km$^2$ (as previously presented in Figure 83).

The Extent of Occurrence (EOO) of the species corresponds to the flora biogeographic ecoregions "(1a) Strandzha Division" and "(1c) Ergene Division". The EOO for this species is calculated as 22,927 km$^2$.

The EAAA (17,391 km$^2$) is greater than 10% of EOO (2,293 km$^2$), therefore the species is considered to trigger Critical Habitat according to Criterion 2.

The ecology of species screened as triggering CH is described in detail in section 6.2.5.

#### 6.2.4.3 Criterion 3: Habitats Supporting Globally Significant Migratory or Congregatory Species

The presence of Key Biodiversity Areas (KBAs) and Important Birds and Biodiversity Areas (IBAs) identified for congregatory species and of Wetlands of International Importance designated under criteria 5 or 6 of the Ramsar Convention was considered. In addition, the presence of migratory and congregatory species was also considered.

In the north-eastern portion, the Project LSA falls within the boundaries of the legally protected area Terkos Basin IBA. In addition, the Marmara region is located on bird migration routes with an approximate North/South direction and is rich in wetlands, such as the Danamandıra Lakes in the middle of the above-mentioned KBA, that contain abundant food reserves for migratory birds. For this reason, Danamandıra Lakes could represent an important resting step during the migratory route of bird species, and also a wintering or breeding ground for many other bird species.

In order to assess the importance of the LSA for these species, the following thresholds were applied (Guidance Note 6, GN78, IFC 2019):

a) areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.

b) areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.

All migratory/ congregatory species triggering the IBAs were assessed according to Criterion 3a threshold "areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle".

In order to assess if the LSA could support globally significant concentrations of the bird species identified as potentially triggering Critical Habitat, according to IFC GN78, an Ecologically Appropriate Area of Analysis (EAAA) was defined by including all the IBAs surrounding the Project LSA: Terkos Basin, Büyükçekmece Lake, Kocaçay Delta, Saros Bay, Meriç Delta and Marmara Islands IBAs (Figure 87). The defined EAAA has an extension of 23,304 $km^2$.

Since a numerical estimation of the individual of the species does not exist, the EAAA is then compared with the extent of occurrence (EOO) of each species, which represents the global population estimate, in order to identify if that area could potentially meet Criterion 3 threshold: if the EAAA is ≥ 1% of the EOO, the area is defined as potentially triggering Critical Habitat (GN78, IFC 2019). The results of the CH screening are discussed below and reported in Table 81.

As a result of the screening, two bird species, the Red-breasted Goose (*Branta ruficollis*) and the Common Pochard (*Aythya ferina*), are potentially triggering Critical Habitat according to Criterion 3.

Based on the ecology of the species (describe at paragraph 6.2.5.2), it is important to specify that the habitats suitable for these two bird species are mainly characterised by wetlands (such as permanent freshwater lakes, swamps and marshes) and tundra habitats for the *Branta ruficollis*. These habitats are not distributed within the LSA under consideration; consequently, these birds, which are reported as triggering species for the Important Bird Area (IBA) of the Terkos Basin, including Lake Terkos, are only considered as passage species within the LSA.

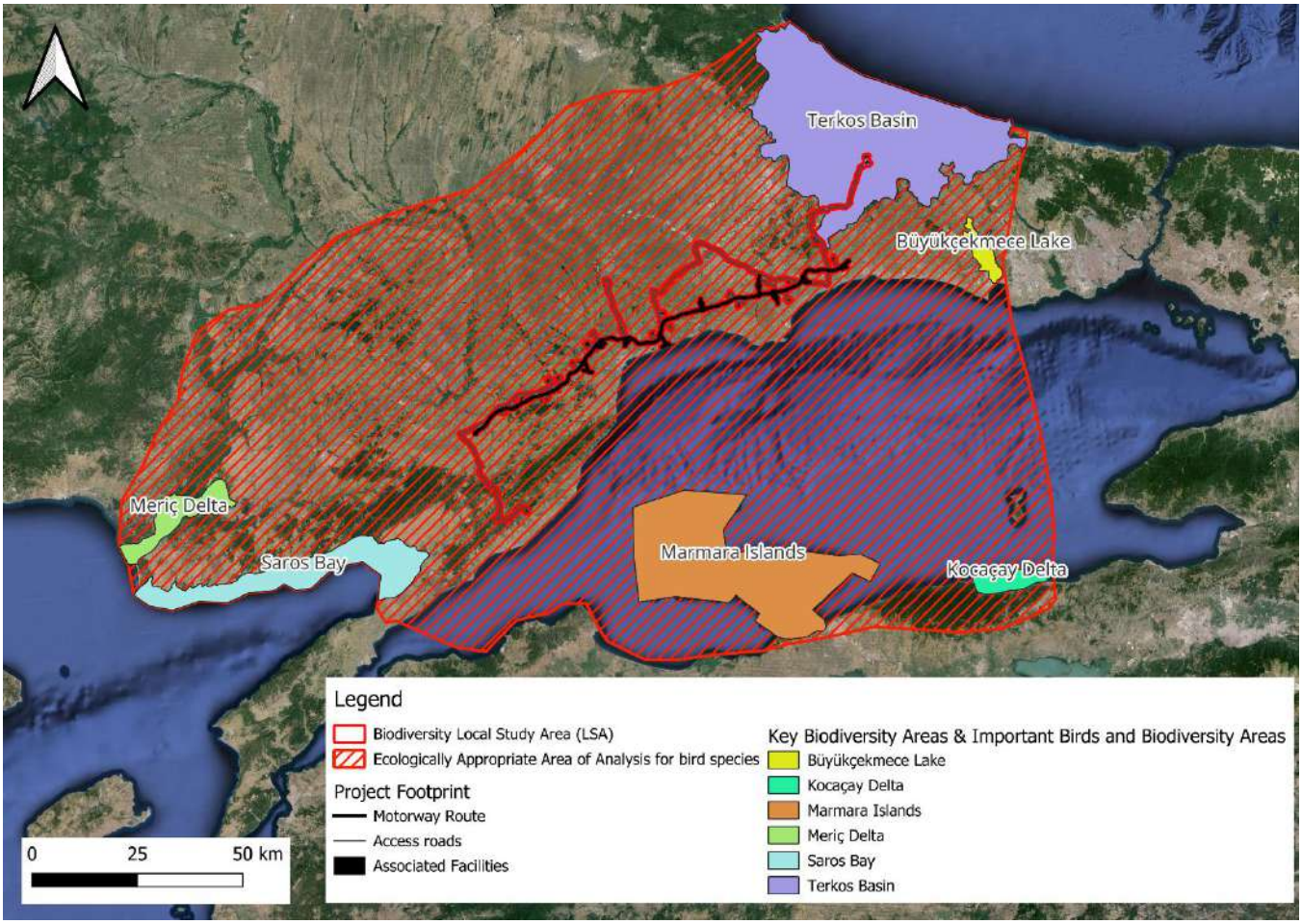



**Figure 87: Ecologically appropriate area of analysis (EAAA) for bird species**

**Table 81: Screening of migratory and congregatory species potentially triggering Critical Habitat according to Criterion 3 (IFC, 2019)**

| Taxon | Species | Common name | IUCN Red List | Status in the IBAs | Lit./ Obs. | EOO ($km^2$) | 1% of EOO ($km^2$) | EAAA ($km^2$) | EAAA is ≥ 1% of EOO | Critical Habitat |
|---|---|---|---|---|---|---|---|---|---|---|
| Bird | *Aythya ferina* | Common Pochard | VU | Wintering (Büyükçekmece Lake and Meriç Delta) | L | 548,000 | 5,480 | 23,304 | Yes | PCH |
| | *Anas crecca* | Common Teal | LC | Wintering (Meriç Delta) | L | 60,200,000 | 602,000 | | No | - |
| | *Anser erythropus* | Lesser White-fronted Goose | VU | Wintering (Saros Bay) | L | 7,060,000 | 70,600 | | No | - |
| | *Ardea purpurea* | Purple Heron | LC | Breeding (Meriç Delta) | L | 131,000,000 | 1,310,000 | | No | - |
| | *Ardeola ralloides* | Squacco Heron | LC | Breeding (Meriç Delta) | L | 54,300,000 | 543,000 | | No | - |
| | *Aythya nyroca* | Ferruginous Duck | NT | Breeding (Terkos Basin and Kocaçay Delta) | L | 25,200,000 | 252,000 | | No | - |
| | *Branta ruficollis* | Red-breasted Goose | VU | Wintering (Terkos Basin, Büyükçekmece Lake, Saros Bay) | L | 1,140,000 | 11,400 | | Yes | PCH |

| Taxon | Species | Common name | IUCN Red List | Status in the IBAs | Lit./ Obs. | EOO (km²) | 1% of EOO (km²) | EAAA (km²) | EAAA is ≥ 1% of EOO | Critical Habitat |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Charadrius alexandrinus* | Kentish Plover | LC | Breeding (Kocaçay Delta) | L | 70,800,000 | 708,000 | | No | - |
| | *Chlidonias hybrida* | Whiskered Tern | LC | Breeding (Terkos Basin and Meriç Delta) | L | 139,000,000 | 1,390,000 | | No | - |
| | *Ciconia nigra* | Black Stork | LC | Breeding (Terkos Basin and Kocaçay Delta) | L | 25,100,000 | 251,000 | | No | - |
| | *Clanga clanga* | Greater Spotted Eagle | VU | Wintering (Meriç Delta) | L | 15,300,000 | 153,000 | | No | - |
| | *Cygnus cygnus* | Whooper Swan | LC | Wintering (Meriç Delta) | L | 29,500,000 | 295,000 | | No | - |
| | *Cygnus olor* | Mute Swan | LC | Wintering (Meriç Delta) | L | 22,500,000 | 225,000 | | No | - |
| | *Egretta garzetta* | Little Egret | LC | Breeding (Meriç Delta) | L | 151,000,000 | 1,510,000 | | No | - |
| | *Falco eleonorae* | Eleonora's Falcon | LC | Breeding (Marmara Islands) | L | 3,090,000 | 30,900 | | No | - |

| Taxon | Species | Common name | IUCN Red List | Status in the IBAs | Lit./ Obs. | EOO (km²) | 1% of EOO (km²) | EAAA (km²) | EAAA is ≥ 1% of EOO | Critical Habitat |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Fulica atra* | Common Coot | LC | Wintering (Kocaçay Delta and Meriç Delta) | L | 152,000,000 | 1,520,000 | | No | - |
| | *Glareola pratincola* | Collared Pratincole | LC | Breeding (Kocaçay Delta, Saros Bay and Meriç Delta) | L | 52,700,000 | 527,000 | | No | - |
| | *Gulosus aristotelis* | European Shag | LC | Breeding (Marmara Islands) | L | 17,600,000 | 176,000 | | No | - |
| | *Himantopus himantopus* | Black-winged Stilt | LC | Breeding (Meriç Delta) | L | 302,000,000 | 3,020,000 | | No | - |
| | *Hydrocoloeus minutus* | Little Gull | LC | Passage (Büyükçekmece Lake) | L | 34,000,000 | 340,000 | | No | - |
| | *Ixobrychus minutus* | Common Little Bittern | LC | Breeding (Meriç Delta) | L | 68,400,000 | 684,000 | | No | - |
| | *Larus melanocephalus* | Mediterranean Gull | LC | Passage (Büyükçekmece Lake) | L | 7,780,000 | 77,800 | | No | - |

| Taxon | Species | Common name | IUCN Red List | Status in the IBAs | Lit./ Obs. | EOO (km²) | 1% of EOO (km²) | EAAA (km²) | EAAA is ≥ 1% of EOO | Critical Habitat |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Larus michahellis* | Yellow-legged Gull | LC | Wintering (Büyükçekmece Lake), Breeding (Marmara Islands) | L | 12,200,000 | 122,000 | | No | - |
| | *Microcarbo pygmaeus* | Pygmy Cormorant | LC | Wintering (Meriç Delta and Terkos Basin), Passage (Terkos Basin) | L | 6,780,000 | 67,800 | | No | - |
| | *Nycticorax nycticorax* | Black-crowned Night-heron | LC | Breeding (Meriç Delta) | L | 248,000,000 | 2,480,000 | | No | - |
| | *Pelecanus crispus* | Dalmatian Pelican | NT | Wintering (Meriç Delta) | L | 12,600,000 | 126,000 | | No | - |
| | *Pelecanus onocrotalus* | Great White Pelican | LC | Passage (Kocaçay Delta) | L | 51,200,000 | 512,000 | | No | - |
| | *Phalacrocorax carbo* | Great Cormorant | LC | Wintering (Meriç Delta) | L | 323,000,000 | 3,230,000 | | No | - |
| | *Platalea leucorodia* | Eurasian Spoonbill | LC | Passage and breeding (Meriç Delta) | L | 56,200,000 | 562,000 | | No | - |

| Taxon | Species | Common name | IUCN Red List | Status in the IBAs | Lit./ Obs. | EOO (km²) | 1% of EOO (km²) | EAAA (km²) | EAAA is ≥ 1% of EOO | Critical Habitat |
|---|---|---|---|---|---|---|---|---|---|---|
| | *Plegadis falcinellus* | Glossy Ibis | LC | Breeding (Meriç Delta) | L | 180,000,000 | 1,800,000 | | No | - |
| | *Puffinus yelkouan* | Yelkouan Shearwater | VU | Non-breeding (Marmara Islands) | L | 5,480,000 | 54,800 | | No | - |
| | *Sternula albifrons* | Little Tern | LC | Breeding (Meriç Delta) | | 204,000,000 | 2,040,000 | | No | - |
| Fish | *Anguilla anguilla* | European eel | CR | - | L | 12,102,844 | 121,028 | 16,640 | No | - |

#### 6.2.4.4 Criterion 4: Highly Threatened and/or Unique Ecosystems

Ecosystems that are at risk of significantly decreasing in area or quality, have a small spatial extent, and/or contain concentrations of biome-restricted species were considered for this criterion.

The Criterion 4 application (GN79, IFC 2019) foresees the use the “Red List of Ecosystems (RLE)” where formal IUCN assessments have been conducted. However, no evaluation was performed in Türkiye as shown in the IUCN RLE Database[116]. Therefore, this system cannot be used at present. Instead, the “European Red List of Habitats” (European Union, 2016) was used to identify threatened Ecosystems.

The “European Red List of Habitats” (European Union, 2016) is the result of an extensive and thorough assessment carried out by Alterra and IUCN with the support of a wide range of experts across Europe. Criteria and categories applied in the European Red List of Habitats to the EUNIS habitat types are based on a protocol proposed in a feasibility study (Rodwell *et al*. 2013[117]), combined with elements of the IUCN Red List of Ecosystems approach for ecosystem risk assessment (Keith *et al*. 2013[118], IUCN 2016). The categories applied to the EUNIS habitat types are analogous to those of the IUCN Red List of Threatened Species. In particular, the CR or EN categories include habitats that are at risk of significantly decreasing in quantity (area or distribution) and/or biotic/abiotic quality, and/or have a small spatial extent, and/or contain concentrations of biome-restricted species and are therefore considered to be at very high risk of collapse.

None of the EUNIS habitats identified within the LSA through desktop photointerpretation and mapping and through field ground-truthing are considered unique ecosystems and/or highly threatened (CR or EN) according to the European Red List of Habitats. In addition, no unique or threatened ecosystems were identified by local experts commissioned by the Client through stakeholder consultation and/or field surveys.

Therefore, no Critical Habitat is expected to be present in the LSA according to this criterion.

#### 6.2.4.5 Criterion 5: Areas Associated with Key Evolutionary Processes

This criterion includes presence of areas with landscape features that might be associated with evolutionary processes or species populations that are especially distinct and may be of special conservation concern given their distinct evolutionary history was considered.

In order to understand if the Project LSA could contain landscape features that may influence evolutionary processes, giving rise to regional configurations of species and ecological properties, the geological and topographical characteristics of the defined ecoregions (see section 6.2.3.1) were considered. The lithological and geo-structural features of the ecoregions were assessed by analysing the Istanbul quadrant, at scale 1:500,000 of the Geological Map of Turkey[119], prepared by the General Directorate of Mineral Research and Exploration. In addition, in order to study the topography of the ecoregions, the ASTER Global Digital Elevation

[116] http://assessments.iucnrle.org/

[117] Rodwell, J.S., Janssen, J.A.M., Gubbay, S. and Schaminée, J.H.J. (2013). Red List Assessment of European Habitat Types. A feasibility study. Report for the European Commission, DG Environment, Brussels.

[118] Keith, D.A., Rodríguez, J.P., Rodríguez-Clark, K.M., Nicholson, E., Aapala, K., Alonso, A., Asmussen, M., Bachman, S., Bassett, A., Barrow, E.G., Benson, J.S., Bishop, M.J., Bonifacio, R., Brooks, T.M., Burgman, M.A., Comer, P., Comín, F.A., Essl, F., Faber-Langendoen, D., Fairweather, P.G., Holdaway, R.J., Jennings, M., Kingsford, R.T., Lester, R.E., Mac Nally, R., McCarthy, M.A., Moat, J., Nicholson, E., Oliveira-Miranda, M.A., Pisanu, P., Poulin, B., Riecken, U., Spalding, M.D. and Zambrano-Martínez, S. (2013). Scientific Foundations for an IUCN Red List of Ecosystems. PLoS ONE 8(5): e62111. http://dx.doi.org/10.1371/journal.pone.0062111

[119] Geological Map of Turkey. General Directorate of Mineral Research and Exploration. Source: https://www.mta.gov.tr/en/maps/geological-500000

Model (GDEM)[120] was analysed, with a focus on the RSAs. This DEM has a resolution of approximately 30 m and was developed by California Institute of Technology, which is part of the National Aeronautics and Space Administration (NASA).

From the analysis of the landscape features identified as potentially influencing evolutionary processes, no unique or idiosyncratic features possibly associated with genetically unique populations or subpopulations of plant and animal species were identified. Indeed, none of the species and/or subpopulations of species identified as present or potentially present within the Project LSA is characterized by a particular level of isolation, spatial heterogeneity, and wealth of environmental gradients or edaphic interfaces. Moreover, the area is not considered to be of demonstrated importance as to climate change adaptation or as biological corridor. These considerations suggest that the study area does not support any key evolutionary processes.

Therefore, no Critical Habitat is expected to be present in the LSA according to this criterion.

### 6.2.5 Ecology of Confirmed Species Triggering Critical Habitats

The table below summarizes the species of flora and fauna identified as Critical Habitats (CHs) and the IFC criteria for which they were considered. Species that could trigger CH but that are considered only potentially present based on literature information and/or species for which insufficient data are available are identified as triggering “Potential Critical Habitat”. Where the critical habitat has been confirmed in at least one occasion it is identified as “Critical habitat”.

In the last column of the table below, for each species the EUNIS codes of the most suitable habitats possibly hosting the species’ presence are specified. Mapping of the critical habitats potentially sustaining the presence of triggering species and specific information on the ecological requirements are provided for each species triggering CH in detail in the paragraphs below.

**Table 82: Flora and fauna species identified as triggering Critical Habitats**

| Taxon | Species | Common name | IUCN Red List | Local IUCN | Endemic/RR | Lit./ Obs. | IFC criteria | Habitat suitability |
|---|---|---|---|---|---|---|---|---|
| Flora | *Cirsium baytopae* | - | - | EN | Endemic/RR | O | Criterion 1a & 2a | G1.7, G5.2, G5.7 |
| Bird | *Aythya ferina* | Common Pochard | VU | - | - | L | Criterion 3a | C2.3 |
| | *Branta ruficollis* | Red-breasted Goose | VU | - | - | L | Criterion 3a | C2.3 |
| Mammal | *Spermophilus citellus* | European Souslik | EN | - | - | L | Criterion 1a | E2.1, E3.2 |

[120] ASTER – Advanced Spaceborne Thermal Emission and Reflection Radiometer. Jet Propulsion Laboratory – California Institute of Technology. NASA Portal. Source: https://asterweb.jpl.nasa.gov/gdem.asp

Since among the species identified as triggering Critical Habitat *Cirsium baytopae* is the only one which was observed during the field activities, Critical Habitat is Confirmed only for this species. A map showing the distribution of Critical Habitat for *Cirsium baytopae* is reported in Figure 92.

#### 6.2.5.1 Flora Species

***Cirsium baytopae* (EN, Restricted Range)**

*Cirsium baytopae* is classified as an endemic species in Türkiye, in the Thrace region, with a restricted distribution range corresponding to the flora biogeographic ecoregion of "(1a) Istranca section" and "(1c) Ergene section"[121] (Figure 88) where the Project is located.

*Cirsium baytopae* is a species belonging to the Asteraceae family (Figure 89; Figure 90, and Figure 91). It has oblong, pinnatisect leaves with lateral and terminal lobes bearing stout apical spines. The inflorescence is a corymbis consisting of capitula with a purple corolla. The fruit is an achene 45-52 mm long. *C. baytopae* is morphologically similar to *C. bulgaricum* from which it differs mainly from the median phyllaries which are markedly recurved in *C. baytopae*[122].

In a study by Ozhatay *et al*. (2013[123]), the species was found in two locations: (i) in the Kıyıköy Coast in dunes that rapidly rise to a height of 90 m and are bordered by an *Erica manipuliflora* dry heath, *Arbutus unedo-Erica arborea* tall heath, *Quercus*-dominated coppice forests, and agricultural grazing lands; (ii) in Taşköprü, along the Turkish-Bulgarian border in an area mostly covered by Fagus and Fagus-Quercus forests.

During the flora survey in June 2022, *C. baytopae* was observed within the LSA at the following sampling stations: SP-8 (1 individuals), SP-9 (15 individuals), SP-10 (10 individuals), SP-11 (10 individuals), SP-12 (5 individuals) and SP-15 (2 individuals). The stations SP08, SP11, SP12 and SP15 were characterized by EUNIS Habitat “G1.7 - Thermophilous deciduous woodland”. The station SP09 is characterized by EUNIS Habitat “G5.2 - Small broadleaved deciduous anthropogenic woodlands”. Finally, the station SP10 is characterized by EUNIS Habitat “G5.7 - Coppice and early-stage plantations”. These habitats are mostly threatened by forest exploitation, as well as clearance and removal of dead wood. Other threats are fragmentation, airborne nitrogen, drainage and overgrazing (European Red List of Habitats).

The EUNIS categories of the habitats patches in which the species was observed were considered to prepare maps of the distribution of Critical Habitats for this species within the Project LSA. These maps include all the patches belonging to G1.7, G5.2 and G5.7 habitat categories located within the Project LSA, recognised as suitable habitats for the presence of *Cirsium baytopae*, and it is reported in Figure 92, Figure 93 and Figure 94. These maps are not prepared at the scale of the entire LSA but are zoomed at the appropriate scale on the sections where patches of Critical Habitats are present. All the areas of critical habitats identified for *Cirsium baytopae* will be visited and verified during the additional verification field surveys, which will be performed as soon as possible, as reported in Section 6.2.2.3. Climatic factor and flowering period of the species will be taken into account to plan the field surveys, in order to increase the possibility to observe this species. For this reason, we suggest considering also April-June as the best period for the verification surveys within the areas belonging to the critical habitat categories for *Cirsium baytopae*. The additional surveys will also aim at collecting primary data on the quality of critical habitats (e.g. conservation level, degradation factors, degradation levels). The

[121] Güner, A., Aslan, S., Ekim, T., Vural, M. and Babaç, MT (edlr.), (2012). List of Plants of Turkey (Veinous Plants). Nezahat Gökyiğit Botanical Garden and Flora Research Association Publication. Istanbul.

[122] Safak, N., & Özhatay, E. (2012). Morphological and Palynological Studies on *Cirsium baytopae* Davis & Parris and *Cirsium bulgaricum* dc. (*Asteraceae*). Analele Stiintifice ale Universitatii" Al. I. Cuza" din Iasi, 58(2), 51.

[123] Özhatay, N., & Öztekin, M. Plant Biodiversity & Unique Yew Stands of Istranca (Yildiz) Mountains in European Turkey. In Yew Workshop 2015 Yew 2015 Duzce, Turkey (p. 76).

gathered information on the verification of critical habitats will be essential for the full understanding of impacts and for the identification of type and extent of required offsets for species triggering CH.

In order to assess the threat status of the species, the threat categories provided in the Red Data Book for Turkish Plants" were re-evaluated by the local expert (Prof. Hayri Duman) considering the latest available information on the species distribution and IUCN 2001 criteria. Accordingly, due to the limited distribution and the threats present to its habitat the species has been rated as Endangered (EN).

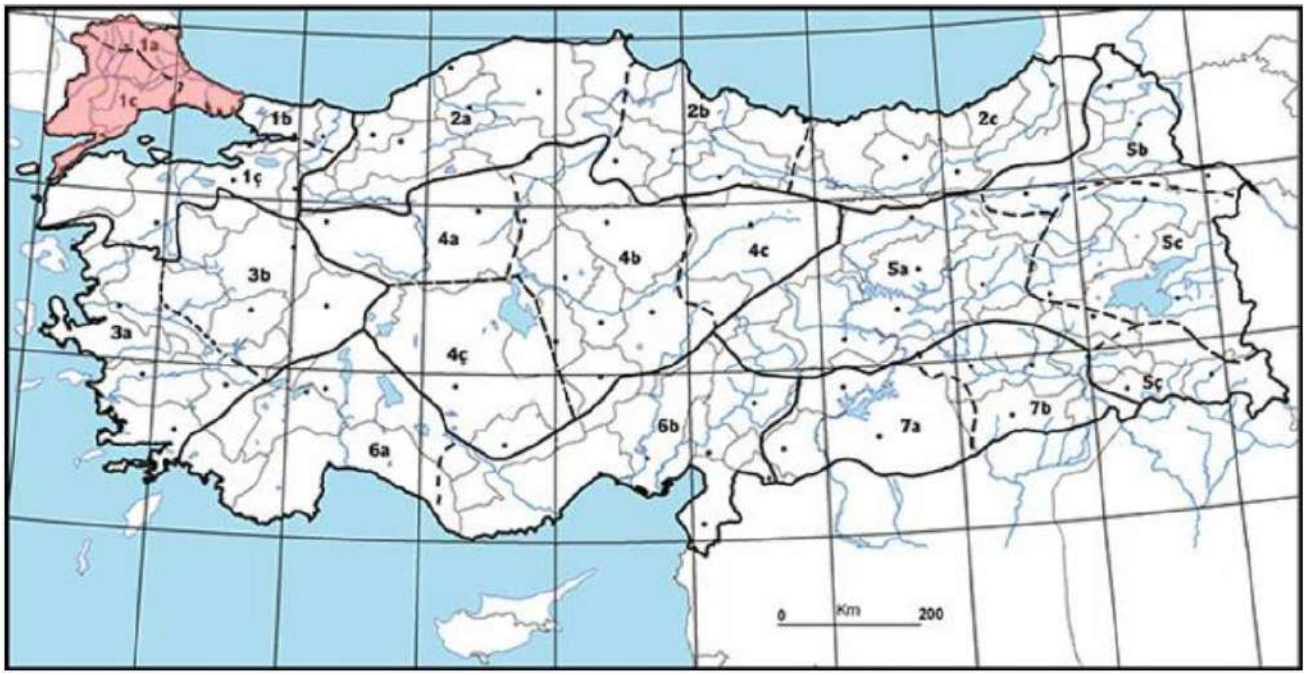



**Figure 88: Cirsium baytopae known distribution range (source: http://www.bizimbitkiler.org.tr/)**




**Figure 89: *Cirsium baytopae* habitus (a) and inflorescence (b). (Sources: Gültekin, 2013[124]; Yildiz *et al*., 2013[125])**

[124] Gültekin, L. (2013). A new weevil genus Nefis gen. nov. (Coleoptera: Curculionidae: Lixinae): systematics and taxonomic revision. Journal of Insect Biodiversity. 1. 1-51.

[125] yildiz, B., arabaci, T., dirmenci, T., (2013) "Two new species of Cirsium (Asteraceae) and notes on allies from Turkey," Turkish Journal of Botany: Vol. 37: No. 6, Article 6.



**Figure 90: Cirsium baytopae individual observed at sampling point SP11 in June 2022**



**Figure 91: Cirsium baytopae individual observed at sampling point SP09 in June 2022**

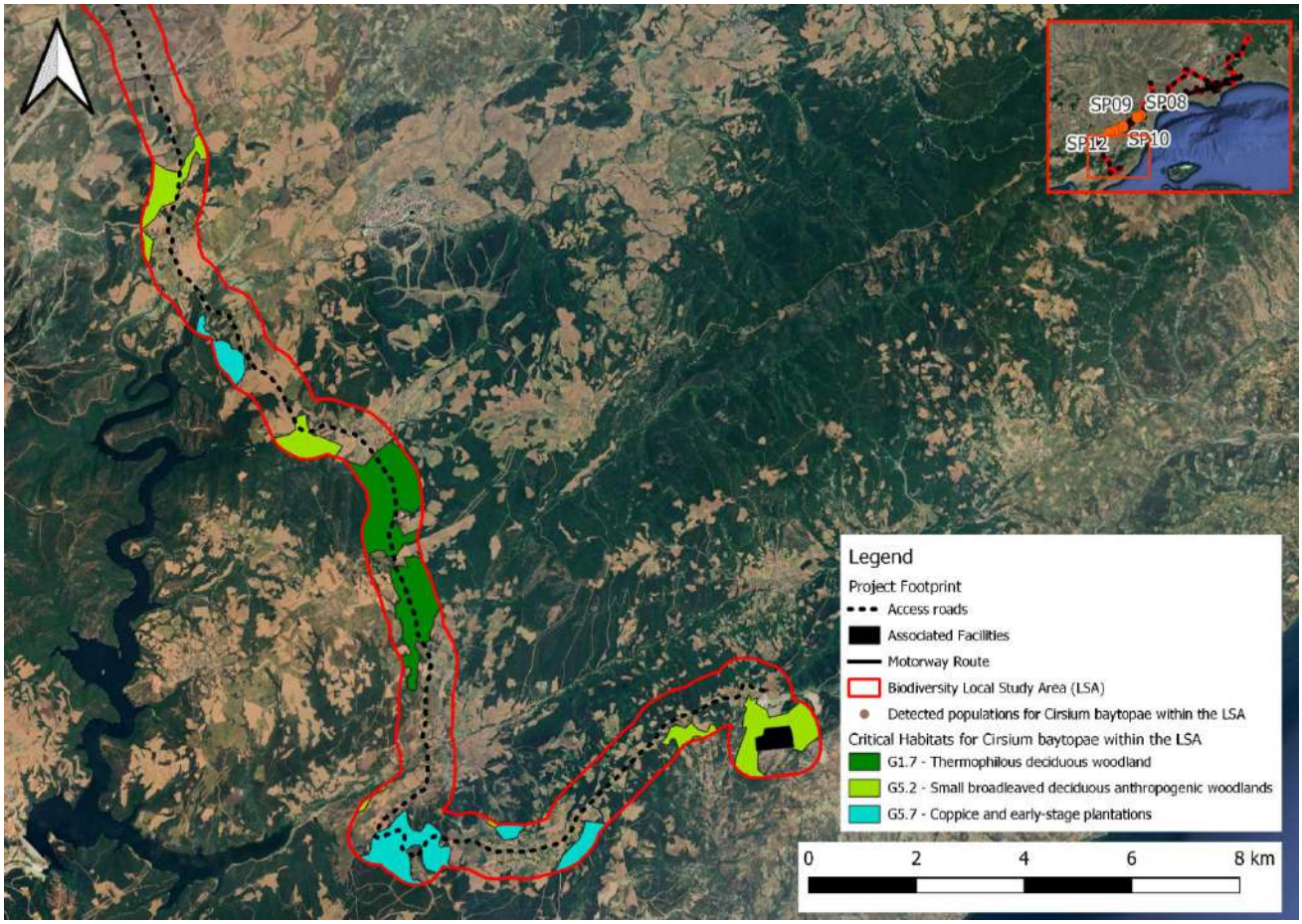



**Figure 92: Distribution of the Critical Habitats for *Cyrsium baytopae* within the Project LSA (south-western section view)**

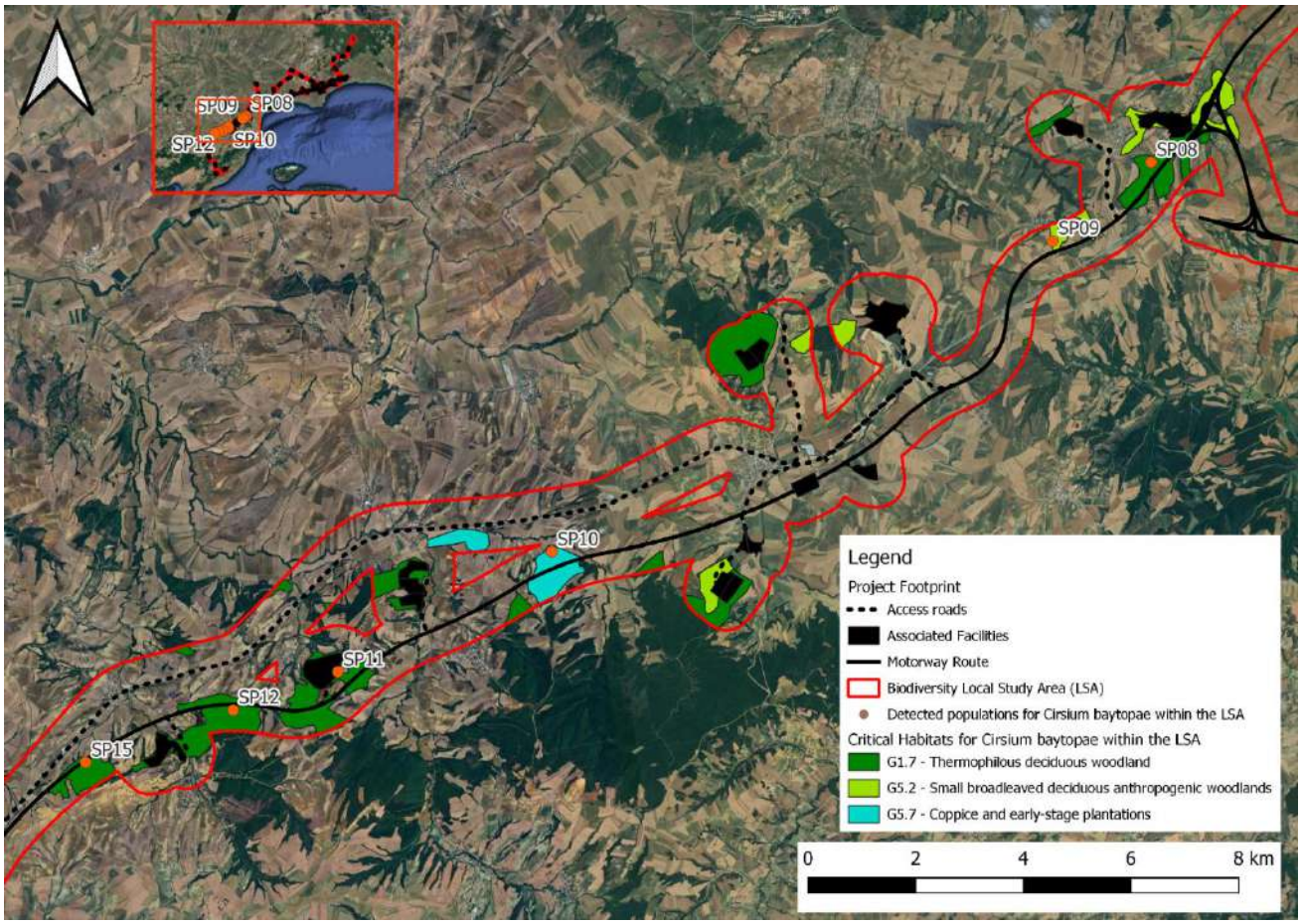



**Figure 93: Distribution of the Critical Habitats for *Cyrsium baytopae* within the Project LSA (central section view)**

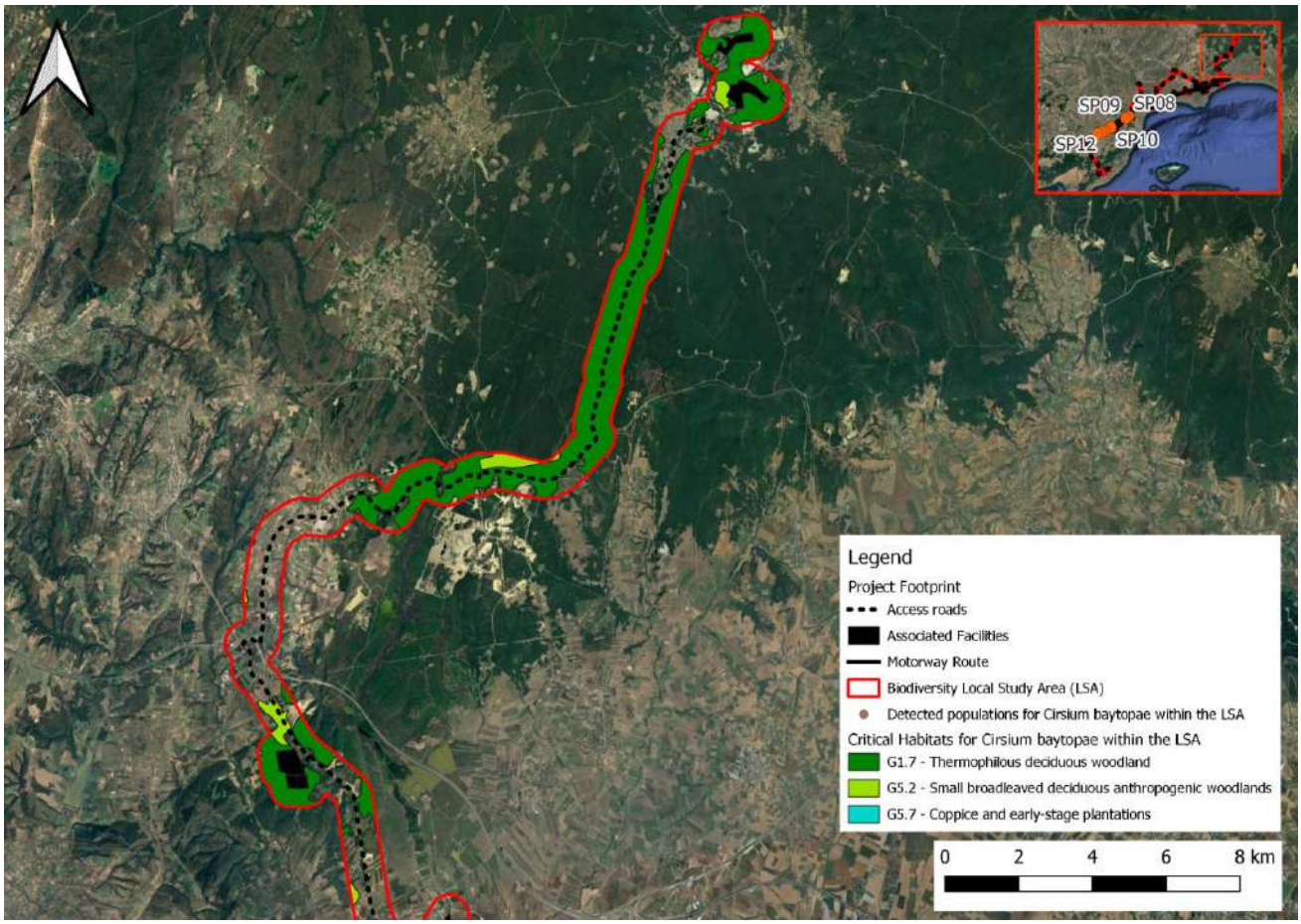



**Figure 94: Distribution of the Critical Habitats for *Cyrsium baytopae* within the Project LSA (north-eastern section view)**

### 6.2.5.2 Bird Species

***Aythya ferina* (VU)**

The common pochard (*Aythya ferina*) is a medium-sized diving duck in the family Anatidae (Figure 95). This species is gregarious and during the winter forms large flocks, often polyspecific with other ducks. It inhabits shallow and highly productive standing waters with abundant emergent and floating vegetation, interspersed with larger areas of open water.

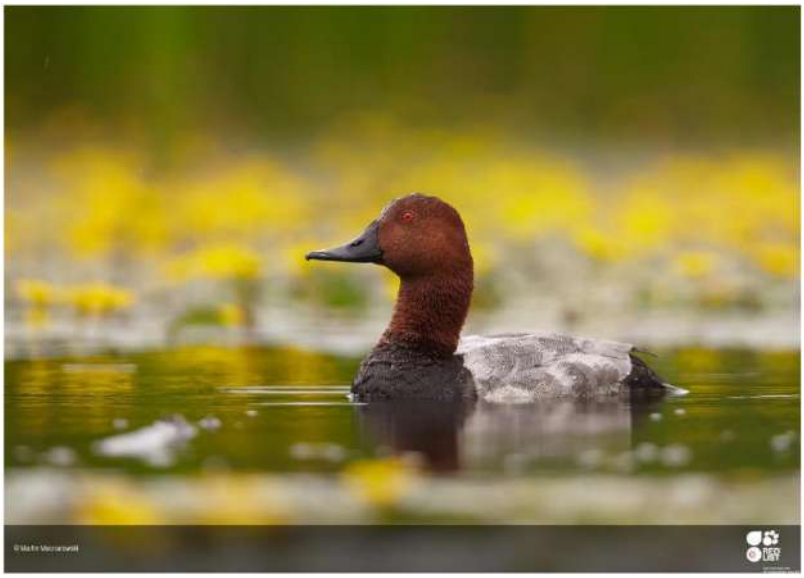


**Figure 95: *Aythya ferina* (VU) (source: IUCN Red List, www.iucnredlist.org[126])**

The species has declined over the past 20 years[127] and is projected to continue to decline[128], for these reasons it is categorized as Vulnerable according to IUCN Red List. Among the possible factors underlying the decline of pochard populations in the North-West European flyway, it is mentioned the decrease in productivity in numerous regions of Central and Eastern Europe, areas previously considered to be important breeding strongholds[129].

The primary factors that have led to the decline in this species are most likely to be a combination of: (i) loss of breeding habitat in eastern Europe, and (ii) changes in water chemistry (especially from hyper-eutrophication caused by agricultural runoff). The main causes related to the loss of habitat are the changes in land management, in particular the abandonment or intensification of management of lowland marshes and fishponds (Fox *et al*., 2016).

Its wintering area goes throughout Europe, in northern Africa along the Nile as far as Sudan, the Mediterranean, Black and Caspian Sea regions, and the Indian sub-continent, through to southern China, Korea and Japan (Hunter, 2005; Reeber, 2015[130]). The breeding area is largely in freshwater to the south of the tundra region across the Palearctic from Iceland to the steppe lakes of Mongolia and the Daurian region (Kear, 2005). The distribution range map of *Aythya farina* is given in Figure 96.

*Aythya ferina* is reported as breeding in the Terkos Basin IBA where its population is estimated to consist of 20 breeding pairs[131]. It was not directly observed during field surveys and is believed to be potentially present as a passage species in the LSA as it lacks suitable habitat.

[126] BirdLife International. 2021. Aythya ferina. The IUCN Red List of Threatened Species 2021: e.T22680358A205288455. https://dx.doi.org/10.2305/IUCN.UK.2021-3.RLTS.T22680358A205288455.en. Accessed on 31 March 2023.

[127] Schricke V. 2002. Elements for a pochard (Aythya ferina) management plan. Game Wildl Sci (Gibier Faune Sauvage) 19:143–178.

[128] BirdLife International (2023) Species factsheet: Aythya ferina. Downloaded from http://www.birdlife.org on 31/03/2023.

[129] Fox, A.D., Dalby, L., Christensen, T.K., Nagy, S., Balsby, T.J.S., Crowe, O., Clausen, P., Deceuninck, B., Devos, K., Holt, C.A., Hornman, M., Keller, V., Langendoen, T., Lehikoinen, A., Lorentsen, S.-H., Malina, B., Nilsson, L., Stı´pniece, A. Svenning, J.-C. & Wahl, J. 2016. Seeking explanations for recent changes in abundance of wintering Eurasian Wigeon Anas penelope in northwest Europe. Ornis Fennica 93: 12–25.

[130] Reeber, S. 2015. Wildfowl of Europe, Asia and North America. Christopher Helm, London, UK.

[131] BirdLife International (2023) Important Bird Areas factsheet: Terkos Basin. Downloaded from http://www.birdlife.org on 31/03/2023.




**Figure 96: *Aythya ferina* (VU) distribution range map (source: http://www.birdlife.org)**

***Branta ruficollis* (VU)**

The Red-breasted Goose (*Branta ruficollis*) is a relatively small goose belonging to the Anatidae family (Figure 97). It breeds in the Artic tundra of the Taimyr, Gydan and Yamal peninsulas of Russia (Hunter, 2005[132]), usually near to rivers and gulleys (Madge and Burn 1988[133]), nesting in hollows and fissures in the ground. The species is highly migratory (del Hoyo *et al*. 1992[134]), therefore after the post-breeding moult, it migrates southwards, arriving on its wintering grounds in October-November (del Hoyo *et al*., 1992, Hunter, 2005). Moreover, it is a gregarious species and tends to form large flocks during the winter.



**Figure 97: Branta ruficollis (source: The European Environment Agency (EEA), https://eunis.eea.europa.eu)**

[132] Hunter, J 2005. Red-breasted Goose. In: Kear, J (editor), Ducks, geese and swans, volume 1: general chapters; species accounts (Anhima to Salvadorina), Oxford, p 335-338.

[133] Madge, S.; Burn, H. 1988. Wildfowl. Christopher Helm, London.

[134] del Hoyo, J., Elliot, A. and Sargatal, J. 1992. Handbook of the Birds of the World, Vol. 1: Ostrich to Ducks. Lynx Edicions, Barcelona, Spain.

A peculiarity of the species' ecology is the fact that it shares its nesting territories with birds of prey such as Rough-legged Buzzard (*Buteo lagopus*), Peregrine Falcon (*Falco peregrinus*) and Snowy Owl (*Bubo scandiaca*). The geese establish their breeding colonies close to the predator's nest, relying on the ability of the predator to first detect and then scare off Polar Foxes looking for incubating waterfowl and waders and their eggs (Quinn *et al*., 2003[135], Rozenfeld *et al*., 2012[136]).

This species has a moderately small population which appears to be declining over a short time period. The reasons for this decline are largely unknown. Trend calculations are complicated by interannual variation in survey coverage and reporting across its range. For instance, the European Red List of Birds suggests that the European population is declining, but only slightly (BirdLife International, 2015), while migration counts suggest a recent increase. Further corroboration is required to confirm an accurate current estimate. Therefore, the species is precautionarily listed as Vulnerable according to IUCN Red List, however if it is found that recent increases are genuine and not a result of improved monitoring efforts or range shifts the species may warrant further downlisting[137].

The main threats contributing to the decline of the species are: (i) loss of winter roosting and feeding areas in eastern Europe due to land privatization, (e.g. the residential and tourist development boom) and (ii) low profitability of agriculture which reduces the area under winter wheat cultivation causing a decrease in the food availability; (iii) hunting pressure (Mateo *et al*., 2016)[138]; (iv) climate change and associated habitat shifts which are expected to impact negatively on this species and others dependent on tundra habitat for breeding. Modelling indicates that 67% of the habitat for this species could be lost by 2070 (Zöckler and Lysenko, 2000[139]). The distribution range map of the species is presented in Figure 98.

*Branta ruficollis* is reported as wintering in the Terkos Basin IBA where its population is estimated to consist of 90 individuals. It was not directly observed during field surveys and is believed to be potentially present as a passage species in the LSA as it lacks suitable habitat.

[135] Quinn, J L, Prop, J, Kokorev, Y & Black, J M 2003. Predator protection or similar habitat selection in red-breasted goose nesting associations: extremes along a continuum. Anim Behav 65: 297-307.

[136] Rozenfeld, S B, Dmitriev, A E, Bulteau, V & Vangeluwe, D 2012a. Rare anseriforms on the northeastern Gydan: the results of 2012 summer survey. Casarca 15: 176182.

[137] BirdLife International. 2017. Branta ruficollis (amended version of 2017 assessment). The IUCN Red List of Threatened Species 2017: e.T22679954A118577901. https://dx.doi.org/10.2305/IUCN.UK.2017-3.RLTS.T22679954A118577901.en. Accessed on 31 March 2023.

[138] Mateo, R.; Petkov, N.; Lopez-Antia, A.; Rodríguez-Estival, J.; Green, A. J. 2016. Risk assessmentofleadpoisoningandpesticideexposureinthe declining populationofred-breastedgoose(Brantaruficollis) wintering in EasternEurope. Environmental Research 151: 359-367.

[139] Zöckler, C. and Lysenko, I. 2000. Water birds on the edge. First circumpolar assessment of climate change impact on Arctic breeding water birds. WCMC, Cambridge, U.K.




**Figure 98: Branta ruficollis (VU) distribution range map (source: http://www.birdlife.org)**

A field survey specifically targeting birds was not performed within the Project LSA. The field survey conducted in June 2022 and focused on surveying terrestrial fauna did not allow to confirm the presence of the two species *Aythya ferina* and *Branta ruficollis*. Therefore, maps of potential Critical Habitats were prepared by taking into consideration the habitat requirements of the two species. Both these species are strongly connected to wetland ecosystems. Among the habitats identified as present within the LSA (see Table 72 in section 6.2.3.2), only C2.3 - Permanent non-tidal, smooth-flowing watercourses was identified as a habitat suitable for potentially sustaining the presence of the two bird species. Based on this approach, the patches of this habitat within the LSA were mapped and are shown in Figure 99 and Figure 100. All the patches of potential critical habitats identified for the two bird species triggering CH will be visited and verified during the additional verification surveys, which will be performed as soon as possible. Seasonality and bird species migration periods will be taken into account to plan the field surveys, in order to enhance the possibility to observe these species. For this reason, we suggest considering March-May as the best period for the verification surveys within the areas belonging to the critical habitat categories for the two bird species triggering CH. The additional surveys will also aim at collecting primary data on the quality of critical habitats (e.g. conservation level, degradation factors, degradation levels). The gathered information on the verification of critical habitats will be essential for the full understanding of impacts and for the identification of type and extent of required offsets for species triggering CH.

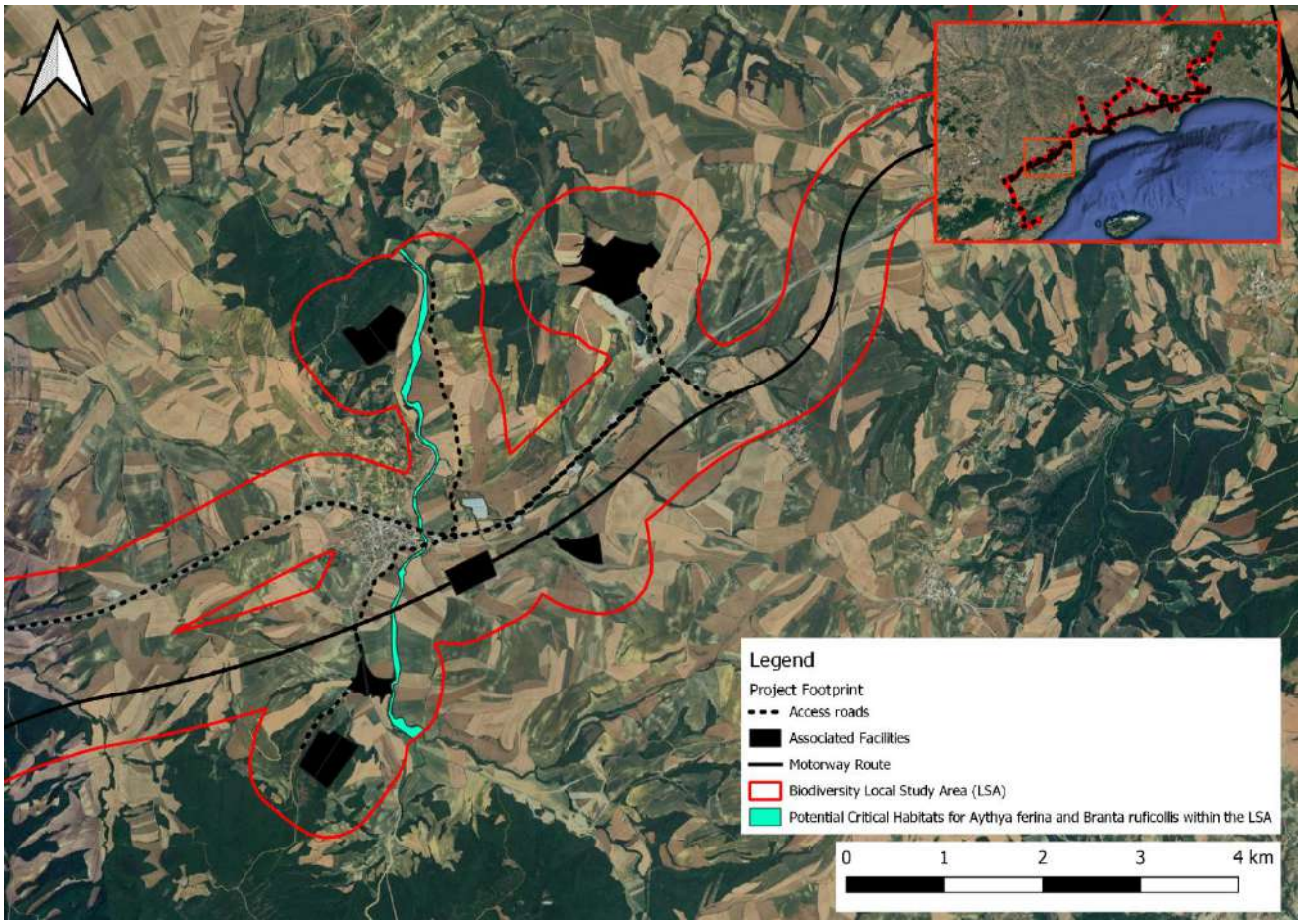



**Figure 99: Distribution of the Critical Habitats potentially sustaining the presence of *Aythya ferina* and *Branta ruficollis* within the Project LSA (south-western section view)**

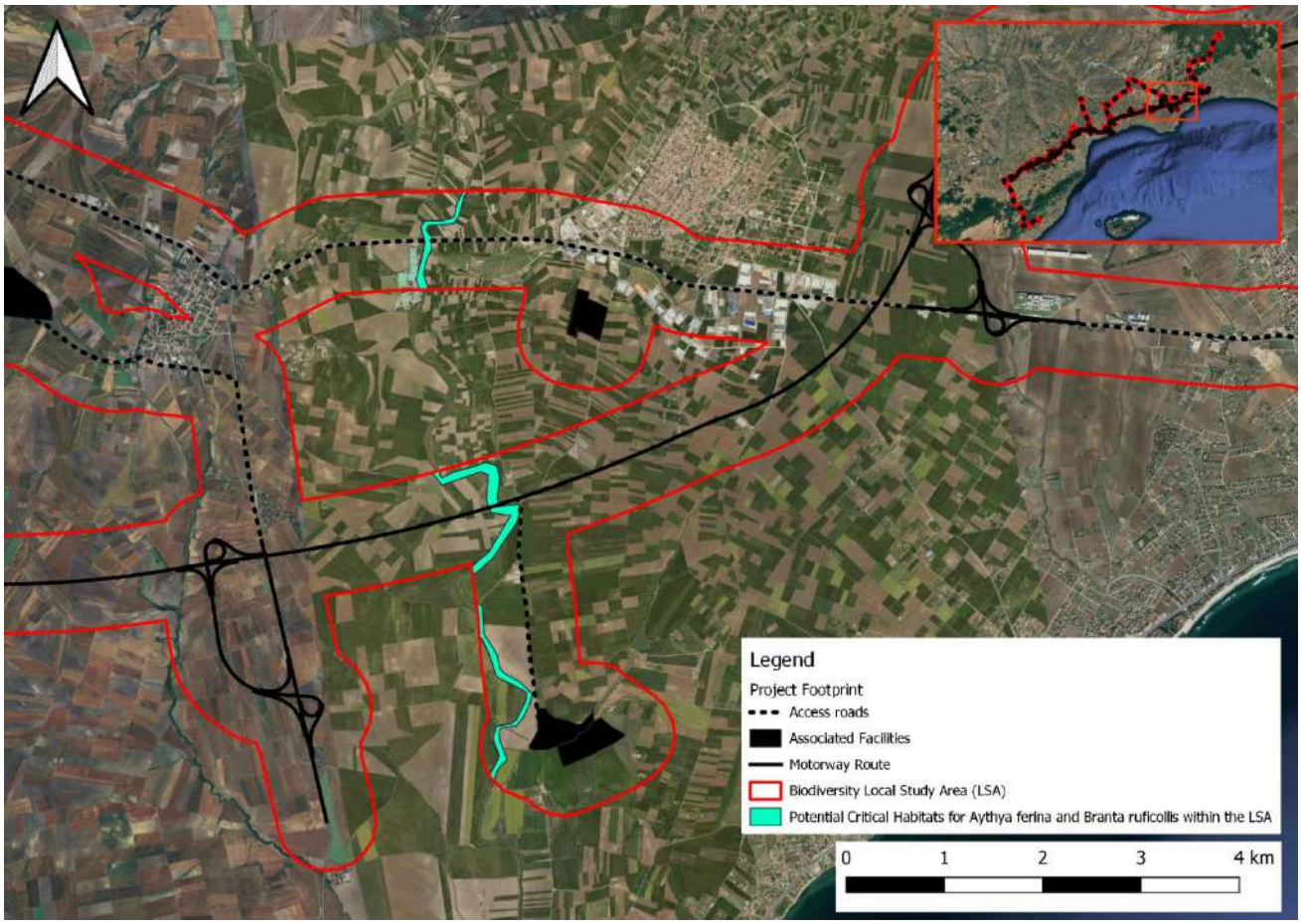



**Figure 100: Distribution of the Critical Habitats potentially sustaining the presence of Aythya ferina and Branta ruficollis within the Project LSA (north-eastern section view)**

### 6.2.5.3 Mammal Species

***Spermophilus citellus* (EN)**

In Türkiye, *Spermophilus citellus*, commonly called the European Souslik is distributed in Turkish Thrace except for the Istranca Mountains (Özkurt *et al*., 2007[140]).

*S. citellus* is a medium-sized ground squirrel of the Sciuridae family with the back and the side of the body generally cream-buff, sometimes more yellowish (Figure 101). It shows a head convex in profile, short vibrissae and large eyes, placed wide apart on the upper side of the head. The eye-ring is whitish or yellowish based on the general coloring of the body. The ears are low and densely covered with fine short hairs on both surfaces. Feet are yellowish with naked pads on palms and soles and with rudimentary thumbs still bearing a nail. It has a short tail, cylindrical at the base and slightly flattened beyond the middle with hairs about 15 mm long (Ramos-Lara *et al*., 2014[141]).

[140] Özkurt, S. O., Soezen, M., Yigit, N., Kandemir, I., Colak, R., Gharkheloo, M. M., & Colak, E. (2007). Taxonomic status of the genus Spermophilus (Mammalia: Rodentia) in Turkey and Iran with description of a new species.

[141] Ramos-Lara, N., Koprowski, J. L., Kryštufek, B., & Hoffmann, I. E. (2014). Spermophilus citellus (Rodentia: sciuridae). Mammalian Species, 46(913), 71-87.



**Figure 101: Adult Spermophilus citellus (source: Ramos-Lara et al., 2014)**

The European Souslik has an omnivorous diet including seeds, roots, shoots, flowers, and arthropods (IUCN, 2020[142]). In steppe habitats that are mowed and pastured only extensive the availability of fresh food may decrease due to accumulation of the dry old grass. On the contrary, in managed grasslands which are regularly mowed and pastured, enough fresh food (e.g., newly grown grass) is ensured throughout the season (Matějů *et al*., 2008[143]) and may explained its preference for this specific habitat.

The species inhabits in grasslands ranging from short-grass steppes to meadow orchards, from sea level to 2500 m asl (Ramos-Lara *et al*., 2014). It is diurnal and it occurs in loosely structured populations, in light, well-drained soils, where it can excavate its burrows (IUCN, 2020[144]). A peculiar feature of *S. citellus* is its preference for anthropogenic habitats in particular for regularly managed grasslands such as airfields, sport areas, gardens, vineyard and orchards (Matějů *et al*., 2008; Hoffman *et al*., 2003[145]).

Although this species can be found in vineyard and orchards, it avoids arable land (IUCN, 2020[146]; Spitzenberg, 2002[147]). In fact, one of the main threats to this species is the conversion of steppe-grassland and pasture to cultivated fields. Another threat posed to the species is habitat loss due to the abandonment of pasture which led to reversion to tall-grass meadows or scrubby habitats (IUCN 2020[148]; Kryštufek, 1999[149]). In a study by Millesi *et al*. (1999[150]) it has been shown that threats of extinction due to habitat loss may be offset by high population densities in areas with strong human impact such as recreational parks.

[142] Hegyeli, Z. 2020. Spermophilus citellus. The IUCN Red List of Threatened Species 2020: e.T20472A91282380.

[143] Matějů, J., Nová, P., Uhlíková, J., Hulová, Š., & Cepáková, E. (2008). Distribution of the European ground squirrel (Spermophilus citellus) in the Czech Republic in 2002–2008. Lynx, 39(2), 277-294.

[144] Hegyeli, Z. 2020. Spermophilus citellus. The IUCN Red List of Threatened Species 2020: e.T20472A91282380.

[145] Hoffmann, I. E., Millesi, E., Huber, S., Everts, L. G., & Dittami, J. P. (2003). Population dynamics of European ground squirrels (Spermophilus citellus) in a suburban area. Journal of Mammalogy, 84(2), 615-626.

[146] Hegyeli, Z. 2020. Spermophilus citellus. The IUCN Red List of Threatened Species 2020: e.T20472A91282380.

[147] Spitzenberger F. 2002. Die Säugetierfauna Österreichs. Bundesministerium für Land- und Forstwirtschaft. Umwelt und Wasserwirtschaft, Band.

[148] Hegyeli, Z. 2020. Spermophilus citellus. The IUCN Red List of Threatened Species 2020: e.T20472A91282380.

[149] Kryštufek, B. 1999. Spermophilus citellus. In: A. J. Mitchell-Jones, G. Amori, W. Bogdanowicz, B. Kryštufek, P. J. H. Reijnders, F. Spitzenberger, M. Stubbe, J. B. M. Thissen, V. Vohralík and J. Zima (eds), The Atlas of European Mammals, pp. 190–191. Academic Press, London, UK.

[150] Millesi, E., Strijkstra, A. M., Hoffmann, I. E., Dittami, J. P., & Daan, S. (1999). Sex and age differences in mass, morphology, and annual cycle in European ground squirrels, Spermophilus citellus. Journal of Mammalogy, 80(1), 218-231.

Thanks to these considerations on the habitat requirements of the species, it was possible to identify E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows and E3.2 - Mediterranean short humid grassland as habitats potentially sustaining the presence of the species within the LSA. Indeed, the species was not observed during the field survey targeting terrestrial fauna conducted in June 2022 and it is considered as potentially present in the LSA based on literature review. Maps of potential Critical Habitats for this species were prepared by considering all the patches of the two habitats identified as suitable for the presence of the species within the LSA. These maps are presented in Figure 102 and Figure 103. All the patches of potential critical habitats identified for *Spermophilus citellus* will be visited and verified during the additional verification surveys, which will be performed as soon as possible. Seasonality, ecology and activity level of the species will be taken into account for planning the field surveys, in order to enhance the possibility to observe this species. For this reason, March-May would be the best period for the verification field surveys within the areas belonging to the critical habitat categories for *Spermophilus citellus*. The additional surveys will also aim at collecting primary data on the quality of critical habitats (e.g. conservation level, degradation factors, degradation levels). The gathered information on the verification of critical habitats will be essential for the full understanding of impacts and for the identification of type and extent of required offsets for species triggering CH.




**Figure 102: Spermophilus citellus (EN) distribution range map**

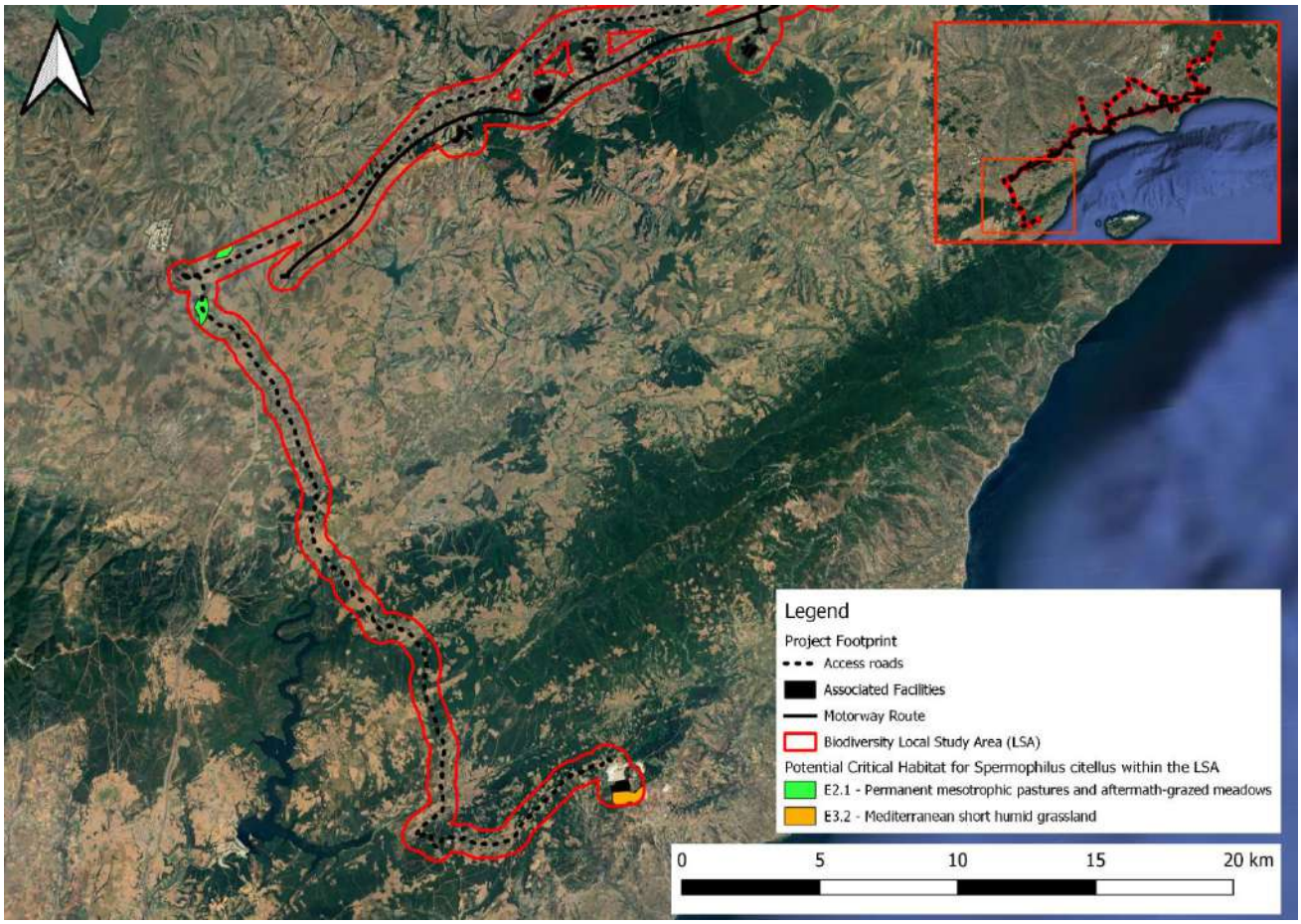



**Figure 103: Distribution of the Critical Habitats potentially sustaining the presence of *Spermophilus citellus* within the Project LSA (south-western section view)**

# 6.3 Social Components

## 6.3.1 Socioeconomic Baseline

### *6.3.1.1 Area of Influence*

The Area of Influence (AoI) is the zone that may be influenced by the Project. Understanding the AoI is an essential requirement for a social impact assessment (SIA), the social baseline must focus on the AoI, although the baseline may have a broader focus, depending on the nature and impact of the Project.

In short, the AoI should include all project related structures and associated facilities (owned or managed) by the client and subcontractors and the associated activities strongly dependent on the Project. In addition, areas and communities directly impacted upon by the proposed project and associated facilities form part of the AoI. Cumulative impacts and potential unintended, but predictable, project consequences should also be considered in the delineation of the AoI.

From a social viewpoint, the AoI perspective is also influenced by direct and induced socio-economic influences (including resettlement, economic displacement, livelihood, health, and safety aspects), spatial implications, intrusion impacts and stakeholder typology.

Based on the considerations indicated in above section, the provinces, districts and the neighbourhoods located in the Project AoI is set as follows in Table 83.

**Table 83: Settlements Located in AoI**

| Province | District | Neighbourhoods | Project Component |
|---|---|---|---|
| **İstanbul** | **Silivri** | Alipaşa | Route |
| | | Çanta Balaban | Route and Associated Facility |
| | | Çeltik | Route and associated facility |
| | | Danamandıra | Associated Facility |
| | | Değirmenköy (Fevzipaşa) | Route |
| | | Gümüşyaka | Route and Associated Facility |
| | | Semizkumlar | Route |
| | | Çanta Sancaktepe | Route |
| | | Yolçatı | Route |
| **Tekirdağ** | **Çorlu** | Maksutlu | Route |
| | | Seymen | Associated Facility |
| | | Şahbaz | Route |
| | | Türkgücü | Route and Associated Facility |
| | | Yenice | Route |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | Route |
| | | Çiftlikönü (Gündoğdu) | Route |
| | | Gazioğlu | Route and Associated Facility |

| Province | District | Neighbourhoods | Project Component |
|---|---|---|---|
| | | Güveçli | Route |
| | | Husunlu | Route and Disposal |
| | | İnecik | Route and Associated Facility |
| | | İstiklal (Eskicami) | Route |
| | | Karaevli | Route |
| | | Karahisarlı | Route |
| | | Kayı | Route |
| | | Kınıklar | Route and Associated Facility |
| | | Köseilyas | Route |
| | | Mahramlı | Route |
| | | Nusratfakı | Route and Associated Facility |
| | | Nusratlı | Route |
| | | Osmanlı | Associated Facility |
| | | Seymenli | Route and Associated Facility |
| | | Yağcı | Route and Associated Facility |
| | | Zafer | Route |
| **Tekirdağ** | **Marmaraereğlisi** | Çeşmeli | Route |
| | | Türkmenli | Route and Associated Facility |
| | | Yakuplu | Route |
| **Tekirdağ** | **Malkara** | Ahievren | Route |
| | | Dereköy | Associated Facility |
| | | Hereke | Route |
| | | Yenice | Route |
| **Tekirdağ** | **Muratlı** | Yukarısırt | Route |
| **Tekirdağ** | **Şarköy** | Tepeköy | Associated Facility |

The AoI of the social components is presented in Figure 104 and the settlements located in the AoI is given in Figure 105.

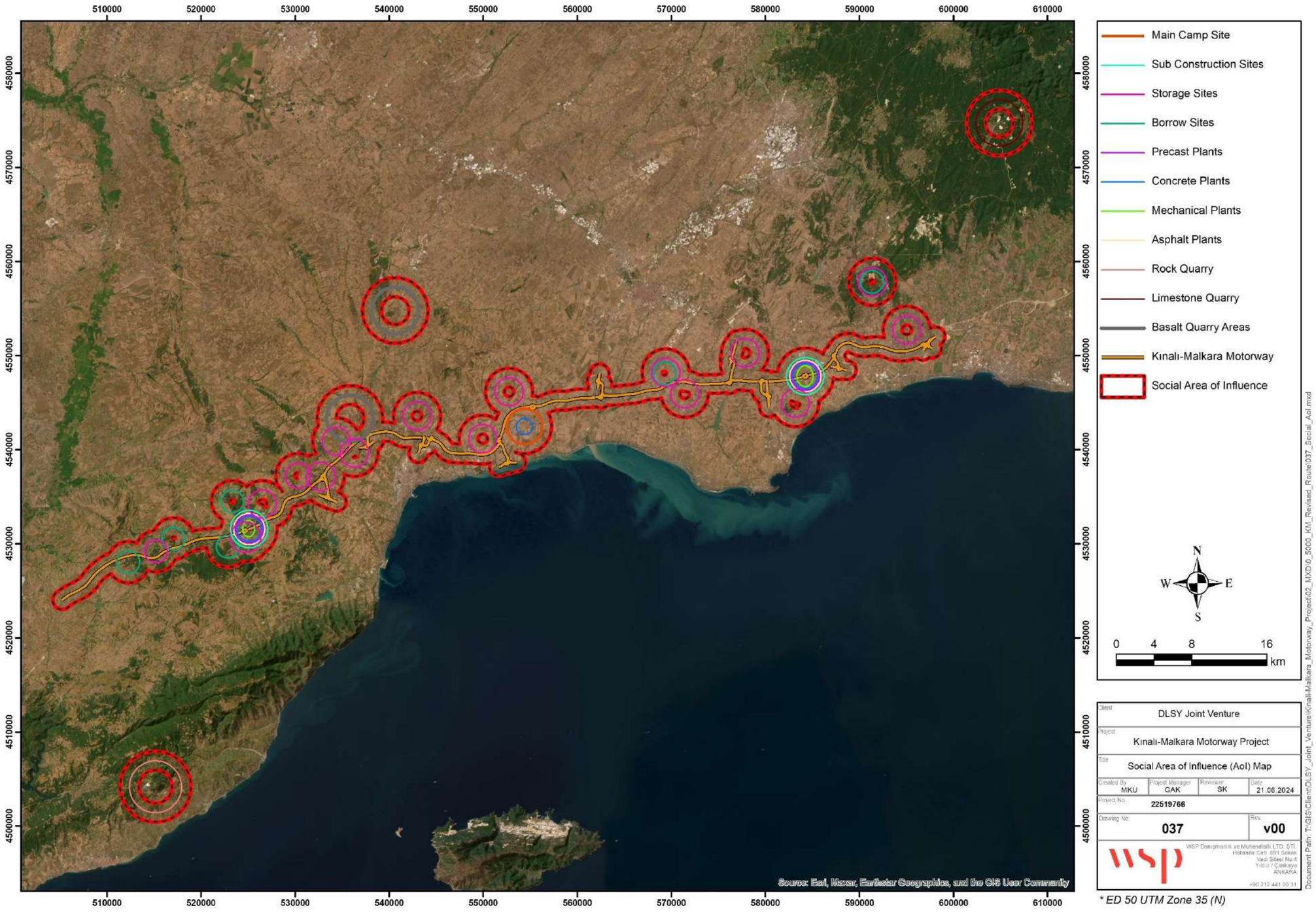



**Figure 104: Area of Influence - Social Components**

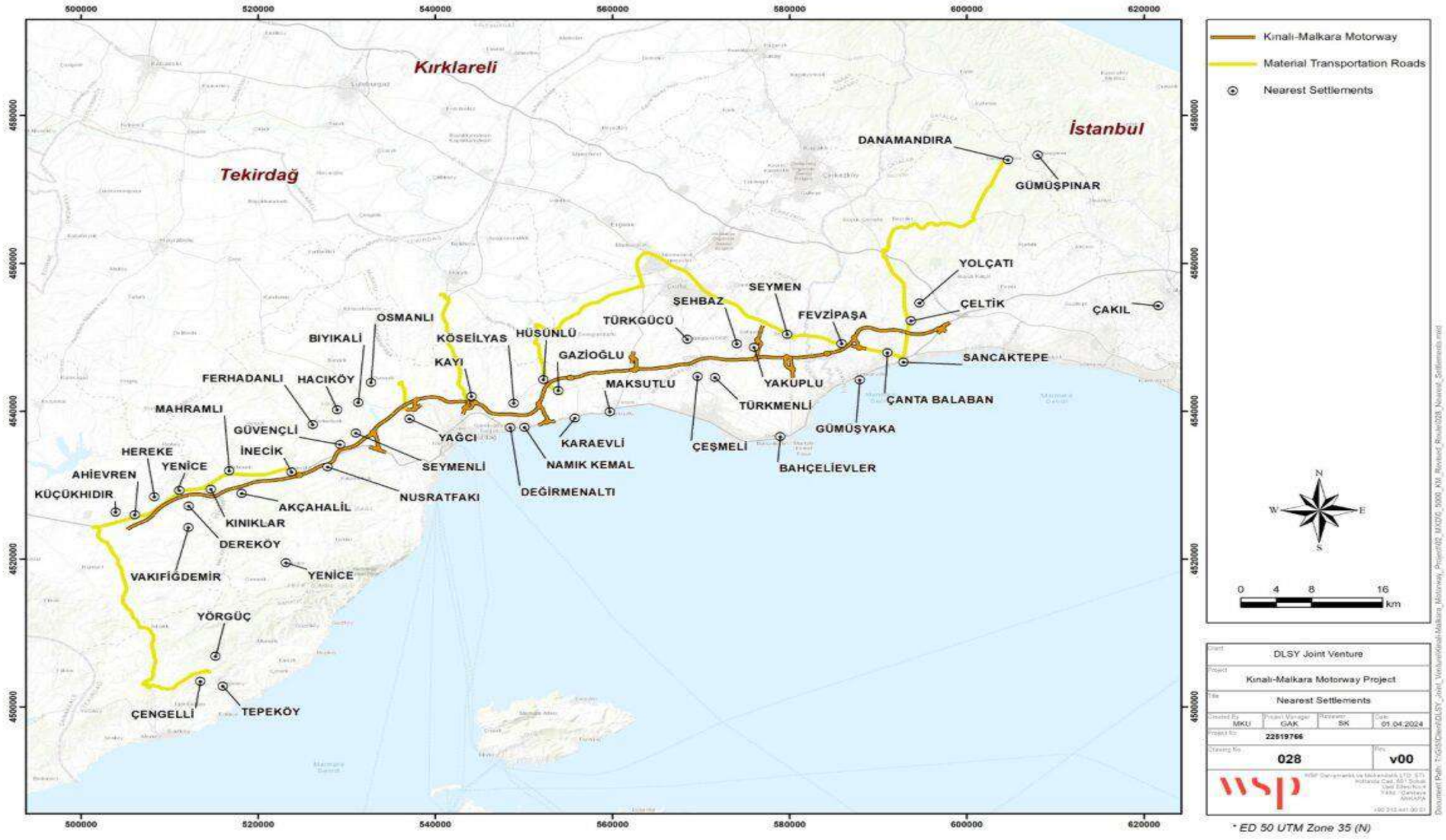



**Figure 105: Nearest Settlements**

#### 6.3.1.2 Methodology

This methodology describes the approach adopted for data collection to develop a socio-economic survey for the Project to develop the socioeconomic baseline and the social impact assessment. This baseline study was performed in order to:

- Understand the characteristics of the social context that may be subject to change due to the Project.
- Understand what resources are available at the household level in terms of livelihoods strategies and coping/resilience mechanisms through profiling households' economic, social, and cultural activities.
- Identifying particular groups deemed vulnerable in the local context and potentially less able to cope with the changes brought about by the Project, or less able to benefit from its positive effects.

### *Introduction*

Kick-off and introduction meetings were conducted with the Project Representatives to understand the Project status and extend of the land requirement of the Project. Following the meetings, Project related documentations including the EIA Study prepared in November 2016 for the entire 324 km long Kınalı – Tekirdağ – Çanakkale – Savaştepe Motorway in conformance with Turkish EIA regulatory requirements.

Based on the received information, SIA has been completed according to the following steps.

### *Questionnaire Preparation*

#### Community Level Surveys

The aim of this survey is to determine the socio-economic status of each settlement comprising of population, migration and reasons of migration, ethnic composition, age distributions, social facilities education level, local conflicts and problems, livelihoods and main income generating activities, economic production in the settlement, land use, land ownership, river and forest usage, services and infrastructure, vulnerable groups, and perceptions of project impacts in the settlement.

The questionnaire of the Community Level Survey is presented in Appendix E.

#### Household Surveys

The sampling approach includes households closest to the Project infrastructure and local transport routes to ensure their impacts are well understood, as well as those further away to capture secondary or indirect impacts. The household surveys gather information on household composition, monthly income per person, income sources, purchasing power, number of employed members, seasonal migration, and total annual income. They also assess the impact of expropriation on their income sources and their perceptions of the effects of the Project and land acquisition.

The questionnaire of the household surveys is presented in Appendix E.

Table 84 presents the baseline topics and details that were covered during the SIA process through community level surveys and household surveys.

**Table 84: Topics Covered by the Socioeconomic Survey**

| Topics | Details |
|---|---|
| Demographics and socio-politics | ▪ Population, broken down by age and gender, including an indication of population trends<br>▪ Seasonal variation in population and its factors<br>▪ Social cohesion<br>▪ Vulnerability<br>▪ In and out migration patterns |
| Economy | ▪ Main economic sector<br>▪ Agricultural and animal husbandry activities<br>▪ Salaries and wages per person by sector |
| Education, skills, and employment | ▪ Education Level<br>▪ Availability and quality of work force, material, and infrastructure |
| Land-use and land-based livelihoods | ▪ Total number and locations of landowners in the Project Area<br>▪ Types/proportion/location of permanent and non-permanent crops grown<br>▪ Types of land-based livelihoods e.g., agriculture/livestock/fishing/beekeeping/ commercial business<br>▪ Status of project land acquisition including number of affected landowners and users<br>▪ Changes in access to natural resources |
| Public Services and Infrastructure | Availability and adequacy of:<br>▪ Water sources<br>▪ Waste disposal facilities / systems (raw and sewerage)<br>▪ Energy sources (types)<br>▪ Public transport and roads<br>▪ Telecommunications services<br>▪ Education services<br>▪ Health services |

#### *6.3.1.3 Social Baseline Studies*

##### 6.3.1.3.1 Desktop Study (Secondary Data)

Secondary data was obtained from national institutions (such as ministries, research institutes, and universities), national and local censuses, web-based published reports, assessment reports of local and national NGOs and project specific documents such as EIA reports. Outputs of the secondary data analysis help to reach a common understanding about the Project. Secondary data can be obtained but not limited to through the following institutions.

- İstanbul, Tekirdağ Governorships
- İstanbul Metropolitan Municipality, Tekirdağ Metropolitan Municipality
- Turkish Statistical Institution
- İstanbul, Tekirdağ Provincial Directorate of Environment and Urbanization and Climate Change
- İstanbul, Tekirdağ Provincial Directorate of Agriculture and Forestry

- İstanbul, Tekirdağ Provincial Directorate of Education
- İstanbul, Tekirdağ Provincial Directorate of Health
- Reports of District Municipalities and Governors
- Development Agencies

#### 6.3.1.3.2 Field Study (Primary Data, First Round of Field Study)

The aim of this survey is to determine the socio-economic status of each settlement inclusive of population, migration and reasons of migration, ethnic composition, age distributions, social facilities (schools, mosques, etc.) in the settlement, education level, local conflicts and problems, livelihoods and main income generation activities, economic production in the settlement, land use, services and infrastructure, ecosystem services, vulnerable groups, and perceptions of project impacts.

According to preliminary analysis and desktop studies, 49 settlements were determined to be affected by the Project based on land acquisition, physical and economic displacement. Community level surveys were performed with the mukhtars and the opinion leaders of the neighbourhoods between January 8$^{th}$ and 14$^{th}$, 2023.

The questionnaires also included a section on discussion of impacts of the Project and other on-going and planned projects in the region, in order to identify cumulative social impacts. Sampling was applied for the neighbourhoods. Table 85 represents the calculation methodology for the determination of the sample size.

**Table 85: Sample Size for Social Impact Assessment**

| | | |
|---|---|---|
| X=Z score (level of accuracy based on confidence level)<br>90% = 1.645<br>95% = 1.960<br>99% = 2.576 | 1.645 | 202.951875 |
| P = population proportion usually 50 %. That means no bias in expected results | 25.00% | |
| % Margin of error (m): Typically 5% =0.05 | 5.00% | |
| Total Target Population Number | 22,666 | |
| **AS= sample size for known population**<br><br>**AS=(S)/1+((S-1)/population)** | | **201** |

During field studies, the aim was to reach the entire predetermined number of sample size. However, some individuals could not be found at certain households, and in some areas, there were those who did not wish to participate in the survey. As a result, the recorded number fell short of the target by less than 10%. Detailed Sample Size for the SIA field study is presented in Table 86.

**Table 86: Detailed Sample Size**

| Neighbourhoods | Number of Conducted Surveys | %(percentage) |
|---|---|---|
| Çakılköy | 9 | 4.8 |
| Gümüşpınar | 4 | 2.2 |
| Fevzipaşa | 11 | 5.9 |
| Çeltik | 4 | 2.2 |
| Yolçatı | 1 | 0.5 |
| Sancaktepe | 16 | 8.6 |
| Çanta Balaban | 12 | 6.5 |
| Gümüşyaka | 25 | 13.4 |
| Esentepe | 12 | 6.5 |
| Seymen | 7 | 3.8 |
| Yakuplu | 6 | 3.2 |
| Şahbaz | 5 | 2.7 |
| Türkmenli | 5 | 2.7 |
| Çeşmeli | 6 | 3.2 |
| Türkgücü | 7 | 3.8 |
| Yenice (Çorlu) | 3 | 1.6 |
| Maksutlu | 1 | 0.5 |
| Ferhadanlı | 2 | 1.1 |
| Karaevli | 2 | 1.1 |
| Gazioğlu | 2 | 1.1 |
| Köseilyas | 3 | 1.6 |
| Husunlu | 1 | 0.5 |
| Bahçelievler | 5 | 2.7 |
| Değirmenaltı | 3 | 1.6 |
| Namık Kemal | 4 | 2.2 |
| Kayı | 1 | 0.5 |
| Yağcı | 2 | 1.1 |

| Neighbourhoods | Number of Conducted Surveys | %(percentage) |
|---|---|---|
| Hacıköy | 1 | 0.5 |
| Bıyıkali | 2 | 1.1 |
| Osmanlı | 1 | 0.5 |
| Seymenli | 1 | 0.5 |
| Güvençli | 2 | 1.1 |
| Nusratfikih | 2 | 1.1 |
| İnecik | 2 | 1.1 |
| Akçahalil | 2 | 1.1 |
| Kınıklar | 2 | 1.1 |
| Dereköy | 1 | 0.5 |
| Vakıfiğdemir | 2 | 1.1 |
| Yenice (Malkara) | 2 | 1.1 |
| Ahievren | 4 | 2.2 |
| Küçükhıdır | 2 | 1.1 |
| Danamandıra | 1 | 0.5 |
| **Total** | **186** | **100.0** |

#### 6.3.1.3.3 Field Study (Primary Data, Second Round of Field Study, 2024)

Socioeconomic baseline studies were first conducted between January 8th and 14th, 2023. The methodology for these studies was presented in the previous section. Following this period, the Client made some changes to the Project Route to minimize environmental impacts, particularly on archaeological components. Details about these route changes are provided in Chapter 4: Analysis of Project Alternatives. The finalization of the Project Route occurred in April 2024, introducing new settlements in the Project Area of Influence. To identify the potential impacts on these new settlements, a second socioeconomic baseline field study was conducted from May 2nd to 4th, 2024. Details of the settlements included in this study, population and the sample size are presented in Table 87

**Table 87: Settlements within the AoI Visited During the second Field Study**

| Settlements | Population | Estimated Household Number | Sample Size |
|---|---|---|---|
| Alipaşa | 1,020 | 312 | 1 |
| Aydoğdu | 10,426 | 3407 | 2 |
| İstiklal (Eskicami) | 14,429 | 4715 | 5 |
| Çiftlikönü (Gündoğdu) | 20,049 | 6552 | 6 |
| Hereke | 16,189 | 5290 | 5 |
| Karahisarlı | 202 | 66 | 4 |

| Settlements | Population | Estimated Household Number | Sample Size |
|---|---|---|---|
| Mahramlı | 126 | 41 | 0 |
| Nusratlı | 238 | 78 | 0 |
| Semizkumlar | 27901 | 8532 | 19 |
| Zafer | 8382 | 2739 | 15 |
| Değirmenköy Fevzipaşa | 3506 | 1072 | 6 |
| Tepeköy | 295 | 122 | 0 |
| Yukarısırt | 50 | 17 | 0 |
| | | **TOTAL** | **63** |

## *Training on the Questionnaires (training of the field researchers)*

For the first field study, on 5th of January 2023, an online training was held with field researchers (social field study team). For the second field study, the training was provided on 30th April 2024. Within the scope of the training, information was given on the following subjects:

- The scope of the Project,
- The structure of the questionnaires,
- How to answers to possible questions from the public and general communication rules.

After the training, questionnaire forms were shared with the researchers and comments were received from them. The questionnaires were edited (in terms of wording etc.) according to the comments of the researchers and finalized.

## *Social Field Study Team*

For the first field study, a study was carried out over a 7-day period between January 8th, and 14th, 2023. Within the scope of the social field study, the neighbourhoods on the Project Route were visited and a community level surveys, and household questionnaires were applied. The social field study was conducted with 7 people and led by a Senior Sociologist Elçin Kaya based on WSP Türkiye.

For the second field study, additional 13 settlements were visited, and field study was carried out between May 2nd and May 4th, 2024, consisting of 4 field researchers and WSP team.

## *Summary of the Field Study*

The demographic information of the neighbourhoods was collected through the community level questionnaire, and through the household questionnaire, both the demographic structure of the households and the Project impacts, including expropriation, were asked to the participants. Social studies were carried out in the provinces of İstanbul and Tekirdağ where Project Route passing through, all questionnaires were entered Statistical Package for the Social Sciences (SPSS) program, and the results are presented in the relevant sections of this report.

### 6.3.1.4 Socioeconomic Structure

In this section, while presenting the social current situation, first the provincial and district level information is presented according to the data obtained from the secondary sources, and then the data of the settlements within the Project AoI are presented according to the data obtained from the field study. Social baseline analysis has been examined on the basis of the district and the neighbourhoods in the AoI. Following sections of the report, represents the social baseline information of the AoI.

### Limitations

As in any social study, this social study is also subjected to certain limitations. These limitations are as follows:

- In most cases, mukhtars did not have enough and precise information on population such as age distribution or education levels of the residents of neighbourhoods. As a result, certain data in this report is based on secondary data,
- In most cases, protection of personal data informed consent forms could not be signed because respondents would not agree to sign any forms,
- Since men are regarded as the head of the households due to the dominance of the patriarchal structure in Türkiye, household surveys were conducted with men, which hindered women's participation in the surveys,
- Also, the people affected by the Project were invited to the centres of the settlements, and women participants could not be reached as the studies were generally conducted in neighbourhood coffees. These public spaces where surveys were conducted are male-dominated spaces—it was not possible to invite women to these places, and some women did not want to invite the researchers to their houses. Thus, gender segregation in terms of the use of public spaces in rural areas is still a problem in Türkiye, which serves as a limitation in providing information on the gender indicators for this report,
- In order to reach women participants to understand women’s own experiences about the Project and the gender dynamics in the AoI, the team visited the households to conduct the surveys with women, but this was possible only on a limited number. As a result, the social impact assessment study was conducted based on the community level surveys and household surveys,
- Even though the socioeconomic survey did not reach the entire planned number, it was completed at a rate close to this number (less than a 10% loss). The main reasons for not reaching the exact numbers are that not all the population in the neighbourhoods live there permanently, as some are in districts and cities for work, and some people do not want to participate in the studies voluntarily.

### 6.3.1.5 Administrative Structure

Provincial Governors: Provincial governors are appointed by the central government and hold the highest administrative authority within their provinces. Their role involves overseeing policy implementation and directives at the provincial level.

Metropolitan municipality: has provincial civil borders and coordinates the district municipalities within these borders. It has administrative and financial autonomy, fulfills duties and responsibilities given by law, and uses its powers. Its decision-making body is elected by the voters. Provincial municipalities in provinces with a population of more than 750,000 can be converted into metropolitan municipalities by law.

District Governors: Appointed by provincial governors, district governors are chief administrative officers at the district level, ensuring efficient governance and service delivery by overseeing policy implementation and programs.

District Municipalities: Operating at the district level, these municipalities handle local governance, managing services, infrastructure projects, and community development initiatives to cater to residents' needs.

Neighbourhoods: These units within districts are governed by local councils or leaders, addressing community-specific issues and representing residents' interests at the sub-administrative level.

### *6.3.1.6 Population and Demography*

#### 6.3.1.6.1 Introduction

The Project AoI comprises the Silivri district of the İstanbul Province and Çorlu, Marmaraereğlisi, Süleymanpaşa, Şarköy, Muratlı and Malkara districts of the Tekirdağ Province, including the route of the motorway and the associated facilities (quarries, borrow pits, camp site etc.). Population and demography are key components to having a good understanding of the characteristics of a community. Information on demographic profiles at the provincial and district levels was obtained from secondary resources. The demographic information of the neighbourhoods was collected through the community-level surveys held with the Mukhtars.

#### 6.3.1.6.2 Province and District Level

According to TURKSTAT data for 2023, the total population of İstanbul was 15,655,924. The male population of İstanbul is **7,806,787**, while the female population is **7,849,137.** The average household size of the province is 3.17, compared to the previous year total population of İstanbul decreased 252,027 people due to the risk of the earthquake.

According to TURKSTAT data for 2023, the total population of Tekirdağ was estimated as 1,167,059. The male population is **595,133**, while the female population is **571,926.** The average household size of the province is 3.06. Compared to the previous year the population of the province is increased 35,000 people. There are 11 districts and 366 neighbourhoods in Tekirdağ. The population density by person/km$^2$ of İstanbul is 3,062, whereas the population density of Tekirdağ is 181. Refer to Table 88 and Table 89 for the main population indicators of the provinces.

**Table 88: Population Distribution of the İstanbul Province**

| İstanbul | Number |
|---|---|
| Total Population | 15,655,924 |
| Male population | 7,806,787 |
| Female population | 7,849.137 |
| Population growth rate (2022) | 4.2% |

*Source: TURKSTAT, 2023*

**Table 89: Population Distribution of the Tekirdağ Province**

| Tekirdağ | Number |
|---|---|
| Total Population | 1,167,059 |
| Male population | **595, 133** |

| Tekirdağ | Number |
|---|---|
| Female population | **571,926** |
| Population growth rate (2022) | 25.8% |

*Source: TURKSTAT, 2023*

Over the years, the population of Istanbul has experienced fluctuations. In 2023, the population decreased slightly compared to the previous year, with a total of 15,655,924 residents. There were slightly more females than males in the province, with 7,849,137 females and 7,806,787 males. This trend has been consistent in recent years, with slight variations in population numbers. For instance, in 2022, the population was slightly higher at 15,907,951, with a similar gender distribution. Despite minor fluctuations, İstanbul remains one of the most populous provinces in the world, with a dynamic demographic landscape. Figure 106 and Figure 107 represent the population change of İstanbul and Tekirdağ in the last 5 years. It can be noticed that the population change in İstanbul Province corresponds to the population change across Türkiye. In the last two years, the population has decreased. In Tekirdağ, there is a steady increase in the last five years.

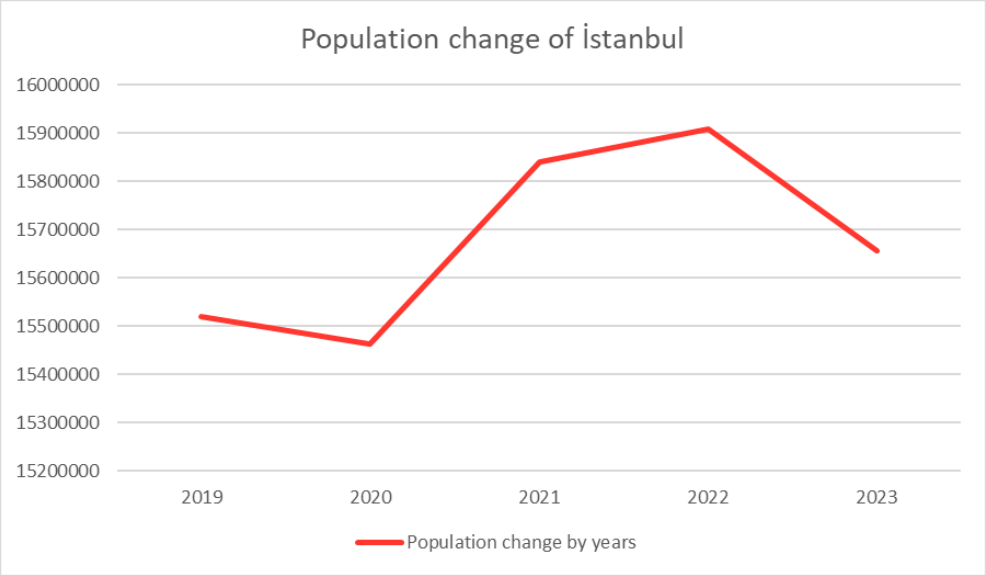



**Figure 106: Population Change of İstanbul in the Last 5 years**

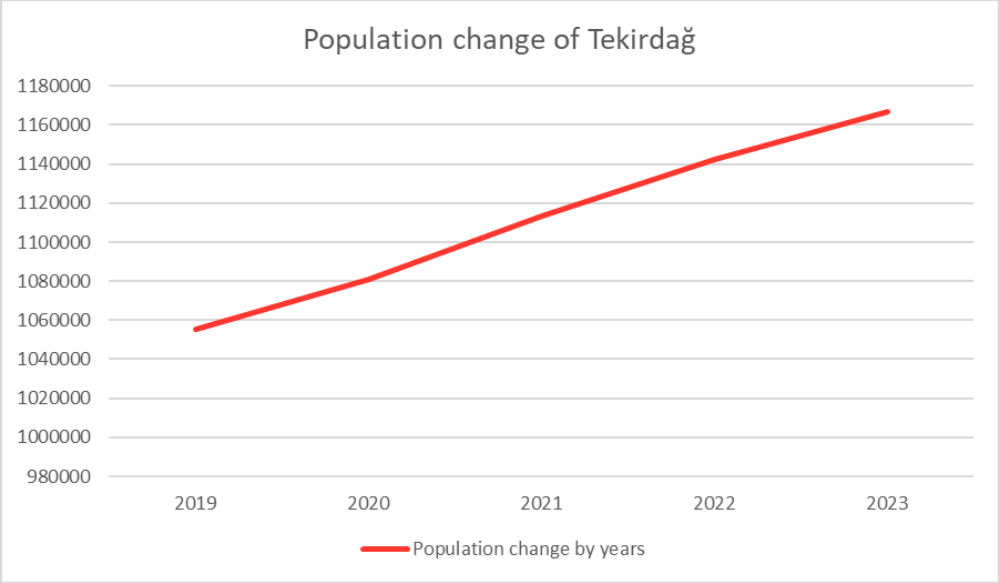



**Figure 107: Population Change of Tekirdağ in the Last 5 years**

In 2023, Esenyurt had the highest district population in İstanbul, with 978,007 residents, comprising 499,225 males and 478,782 females, accounting for 6.25% of the total population. Küçükçekmece followed closely with 792,030 residents, consisting of 394,643 males and 397,387 females, representing 5.06% of the total population. Pendik had a population of 743,774, with 374,268 males and 369,506 females, making up 4.75% of the total population. Ümraniye and Bağcılar rounded up the top five districts with populations of 723,760 and 719,071, respectively. The population percentages of these districts ranged from 4.62% to 4.59% of the total population of Istanbul. The data further illustrates the demographic distribution across various districts of İstanbul in 2023.

**Table 90: Population Figures of Districts of İstanbul as of 2023**

| District | Population | Male Population | Female Population | Population Density of Districts (%) |
|---|---|---|---|---|
| Esenyurt | 978,007 | 499,225 | 478,782 | 6.25 |
| Küçükçekmece | 792,030 | 394,643 | 397,387 | 5.06 |
| Pendik | 743,774 | 374,268 | 369,506 | 4.75 |
| Ümraniye | 723,760 | 361,098 | 362,662 | 4.62 |
| Bağcılar | 719,071 | 364,573 | 354,498 | 4.59 |
| Bahçelievler | 567,848 | 283,349 | 284,499 | 3.63 |
| Sultangazi | 532,802 | 270,730 | 262,072 | 3.40 |
| Maltepe | 523,137 | 260,108 | 263,029 | 3.34 |
| Üsküdar | 517,348 | 251,691 | 265,657 | 3.30 |

| District | Population | Male Population | Female Population | Population Density of Districts (%) |
|---|---|---|---|---|
| Başakşehir | 509,915 | 254,619 | 255,296 | 3.26 |
| Gaziosmanpaşa | 492,804 | 249,154 | 243,650 | 3.15 |
| Kadıköy | 483,830 | 242,566 | 241,264 | 3.09 |
| Kartal | 475,042 | 233,786 | 241,256 | 3.03 |
| Sancaktepe | 467,919 | 210,486 | 257,433 | 2.99 |
| Avcılar | 445,672 | 223,788 | 221,884 | 2.85 |
| Kağıthane | 437,221 | 218,608 | 218,613 | 2.79 |
| Esenler | 427,901 | 218,773 | 209,128 | 2.73 |
| Ataşehir | 420,194 | 209,185 | 211,009 | 2.68 |
| Eyüpsultan | 416,529 | 203,651 | 212,878 | 2.66 |
| Beylikdüzü | 409,347 | 199,443 | 209,904 | 2.61 |
| Fatih | 360,702 | 183,988 | 176,714 | 2.30 |
| Sarıyer | 356,025 | 177,058 | 178,967 | 2.27 |
| Sultanbeyli | 344,250 | 169,706 | 174,544 | 2.20 |
| Arnavutköy | 336,062 | 172,701 | 163,361 | 2.15 |
| Zeytinburnu | 299,806 | 148,856 | 150,950 | 1.91 |
| Çekmeköy | 293,604 | 148,950 | 144,654 | 1.88 |
| Tuzla | 280,896 | 138,336 | 142,560 | 1.79 |
| Şişli | 276,572 | 136,094 | 140,478 | 1.77 |
| Güngören | 269,944 | 135,134 | 134,810 | 1.72 |
| Bayrampaşa | 268,850 | 134,807 | 134,043 | 1.72 |
| Büyükçekmece | 264,736 | 128,084 | 136,652 | 1.69 |
| Beykoz | 245,647 | 121,489 | 124,158 | 1.57 |
| Beyoğlu | 221,723 | 122,742 | 98,981 | 1.42 |
| Bakırköy | 220,476 | 102,825 | 117,651 | 1.41 |

| District | Population | Male Population | Female Population | Population Density of Districts (%) |
|---|---|---|---|---|
| Silivri | 218,589 | 112,382 | 106,207 | 1.40 |
| Beşiktaş | 169,022 | 75,721 | 93,301 | 1.08 |
| Çatalca | 80,007 | 40,904 | 39,103 | 0.51 |
| Şile | 48,537 | 25,048 | 23,489 | 0.31 |
| Adalar | 16,325 | 8,218 | 8,107 | 0.10 |

In 2023, Çorlu emerged as the most populous district in the region, with a population of 294,020 residents, of which 149,368 were males and 144,652 were females. This constituted approximately 25.19% of the total population. Following closely was Süleymanpaşa with a population of 219,230, representing 18.78% of the total population, and Çerkezköy with 213,243 residents, making up 18.27% of the total population. Kapaklı and Ergene rounded out the top five districts, each accounting for approximately 12.22% and 5.89% of the total population, respectively. These statistics highlight the demographic distribution and relative population sizes of various districts in 2023.

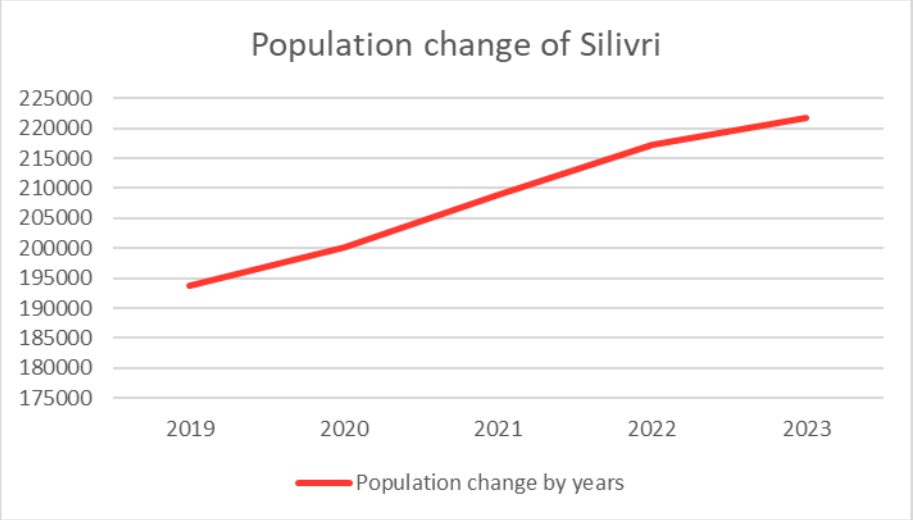
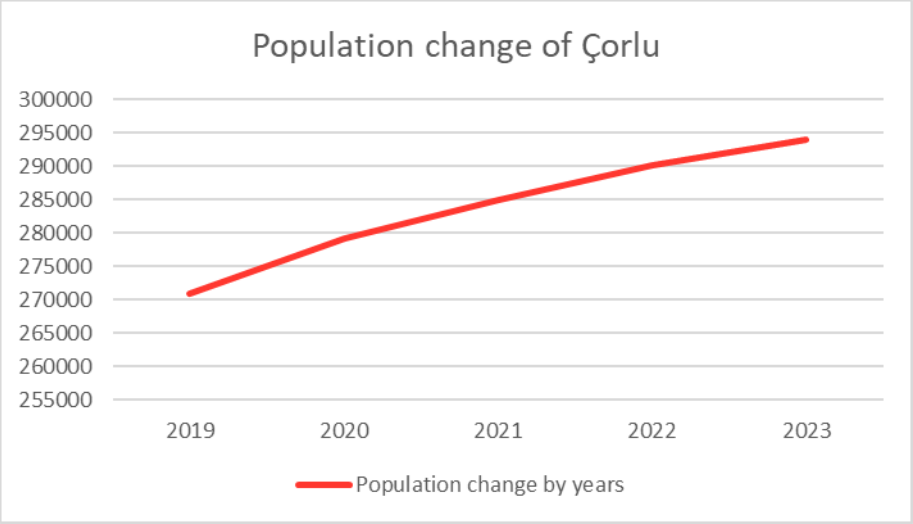
**Table 91: Population Figures of Districts of Tekirdağ as of 2023**

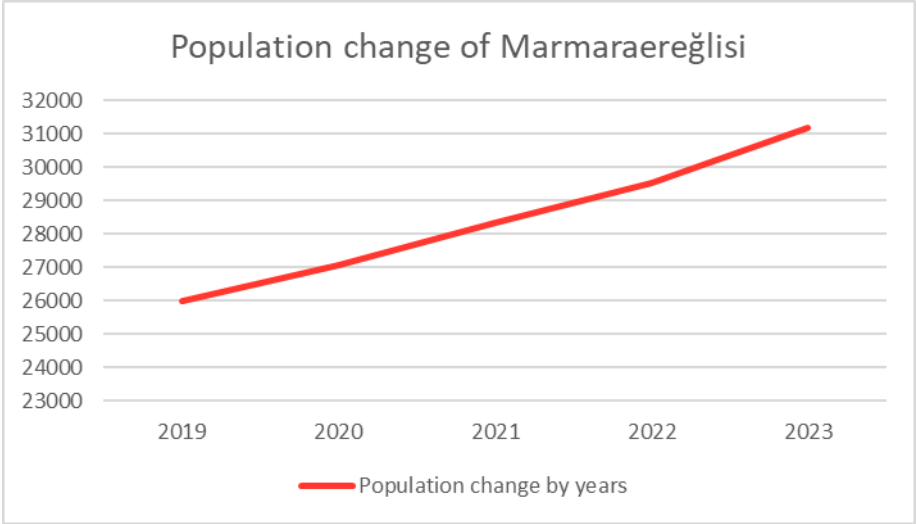
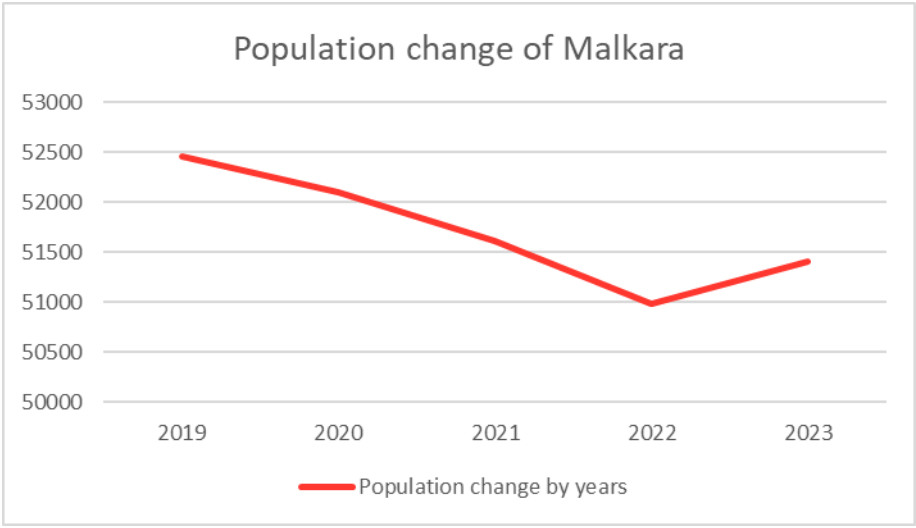
| District | Population | Male Population | Female Population | Population Density (%) |
|---|---|---|---|---|
| Çorlu | **294,020** | **149,368** | **144,652** | **25.19** |
| Süleymanpaşa | **219,230** | **110,456** | **108,774** | **18.78** |
| Çerkezköy | 213,243 | 109,643 | 103,600 | 18.27 |
| Kapaklı | 142,662 | 73,614 | 69,048 | 12.22 |
| Ergene | 68,695 | 35,512 | 33,183 | 5.89 |
| Malkara | **51,406** | **26,131** | **25,275** | **4.40** |
| Saray | 51,224 | 25,965 | 25,259 | 4.39 |
| Şarköy | **34,047** | **17,061** | **16,986** | **2.92** |
| Hayrabolu | 31,191 | 16,093 | 15,098 | 2.67 |
| Muratlı | 30,930 | 15,902 | 15,028 | 2.65 |
| Marmaraereğlisi | **30,411** | **15,388** | **15,023** | **2.61** |

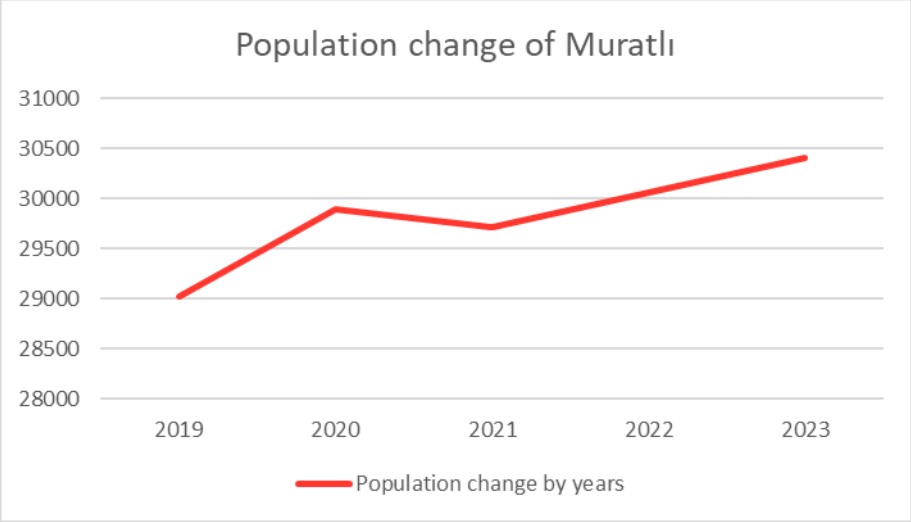
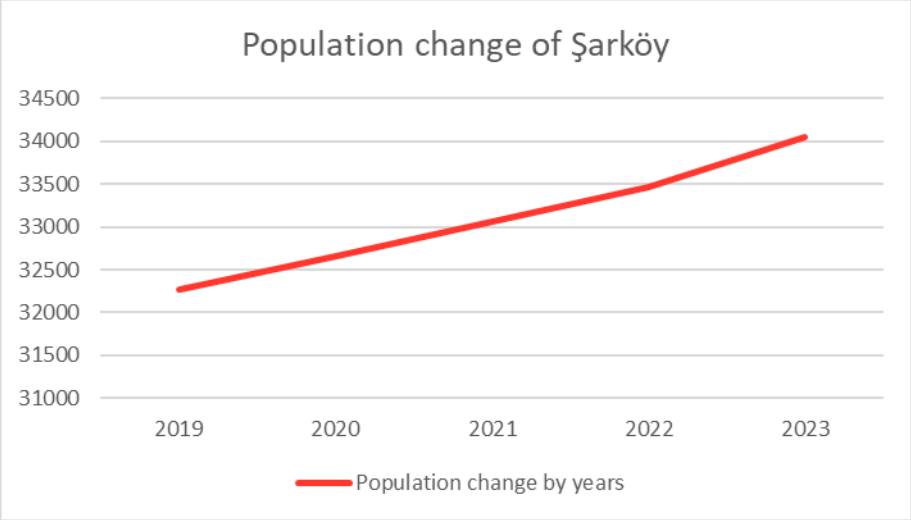
*Source: TURKSTAT, 2023*

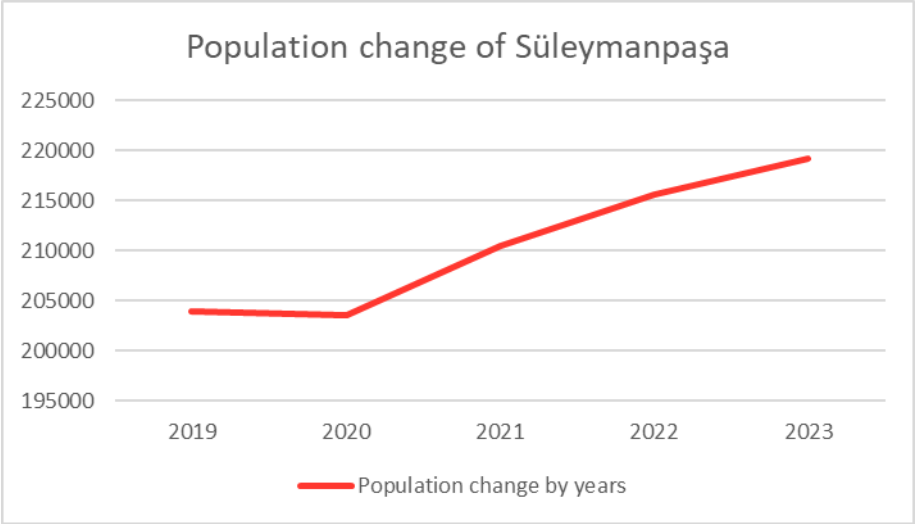
Table 92 represents the population changes in the districts of the AoI in the last five years according to the latest TURKSTAT 2023 data.

**Table 92: Population Change of Districts of AoI in the Last 5 years**

| Province | District | Population Change |
|---|---|---|
| **İstanbul** | **Silivri** |  |
| **Tekirdağ** | **Çorlu** |  |

| Province | District | Population Change |
|---|---|---|
| | **Marmaraereğlisi** |  |
| | **Malkara** |  |

| Province | District | Population Change |
|---|---|---|
| | **Muratlı** |  |
| | **Şarköy** |  |

| Province | District | Population Change |
|---|---|---|
| | **Süleymanpaşa** |  |



## Age Distribution

Table 93 and Table 94 present the age distribution of the population of the İstanbul and Tekirdağ and provinces.

In İstanbul, the age groups of 25-29, 30-34, 35-39 and 40-44 comprised almost the same proportion of the total population, with the population aged between 40 and 44 being the largest group compared to others. Apart from that, people aged between 60-64 makes up the smallest proportion of the total population.

**Table 93: Age Distribution of İstanbul Population**

| Age Group | Population | Population % |
|---|---:|---:|
| 0-4 | 977,711 | 6.15 |
| 5-9 | 1,169,044 | 7.35 |
| 10-14 | 1,117,067 | 7.02 |
| 15-19 | 1,109,215 | 6.97 |
| 20-24 | 1,241,736 | 7.81 |
| 25-29 | 1,348,973 | 8.48 |
| 30-34 | 1,340,773 | 8.43 |
| 35-39 | 1,356,875 | 8.53 |
| 40-44 | 1,408,123 | 8.85 |
| 45-49 | 1,202,013 | 7.56 |

| Age Group | Population | Population % |
|---|---|---|
| 50-54 | 992,240 | 6.24 |
| 55-59 | 814,234 | 5.12 |
| 60-64 | 619,081 | 3.89 |
| 65+ | 1,210,866 | 7.61 |

In Tekirdağ Province, the population aged 65 and older is the largest group compared to others, while the population aged between 60-64 is the smallest. This might indicate that in the near following years, the predominance of the population aged 65 and older might be decreased. Apart from that, the population density is comprised chiefly of those aged between 30 and 44.

**Table 94: Age Distribution of Tekirdağ Population**

| Age Group | Population | Population by percentage (%) |
|---|---|---|
| 0-4 | 72,752 | 6.37 |
| 5-9 | 84,752 | 7.42 |
| 10-14 | 80,269 | 7.03 |
| 15-19 | 75,408 | 6.60 |
| 20-24 | 80,070 | 7.01 |
| 25-29 | 88,997 | 7.79 |
| 30-34 | 91,021 | 7.97 |
| 35-39 | 93,579 | 8.19 |
| 40-44 | 98,666 | 8.64 |
| 45-49 | 81,905 | 7.17 |
| 50-54 | 70,535 | 6.17 |
| 55-59 | 62,498 | 5.47 |
| 60-64 | 53,639 | 4.70 |
| 65+ | 108,360 | 9.48 |

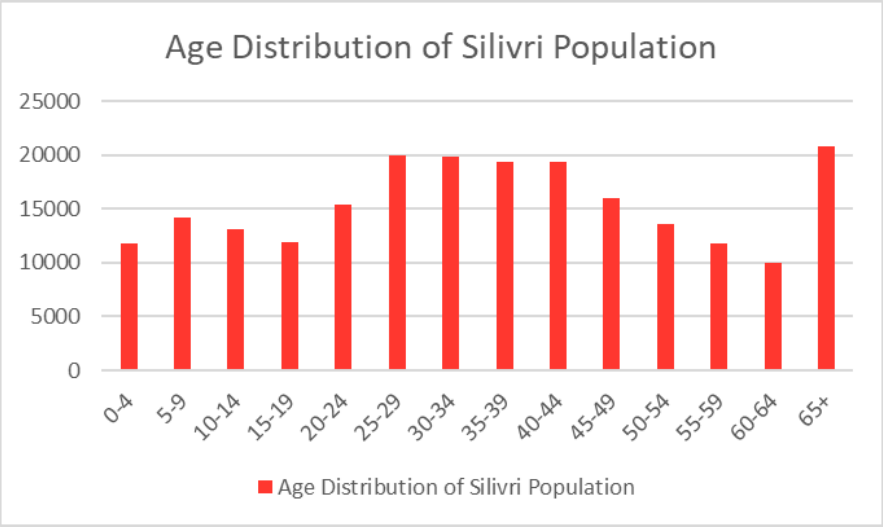
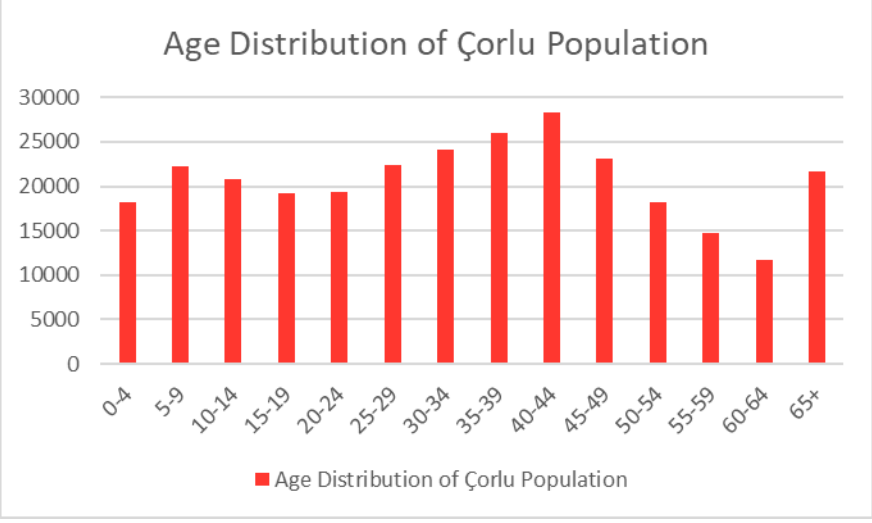
Marmaraereğlisi, Malkara, and Şarköy districts have similar trends of age distribution, with the population aged 65 and older having the largest proportion of the total population and the remaining age groups having similar

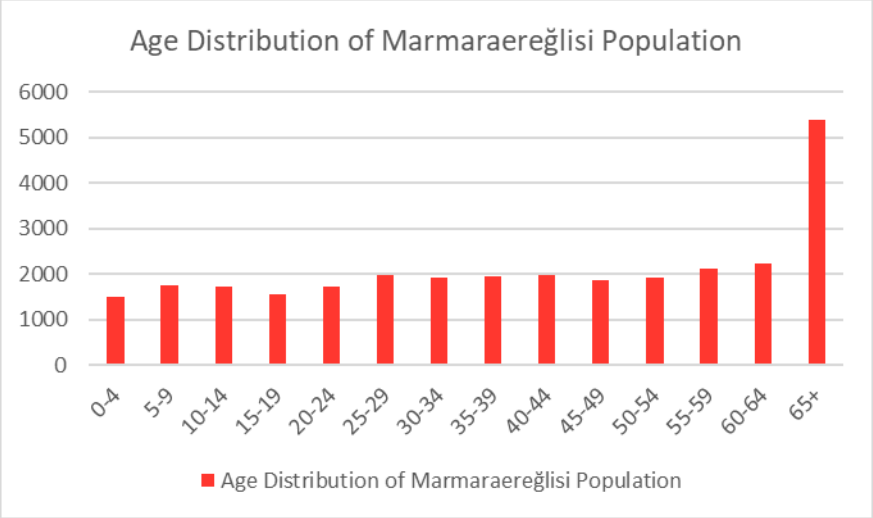
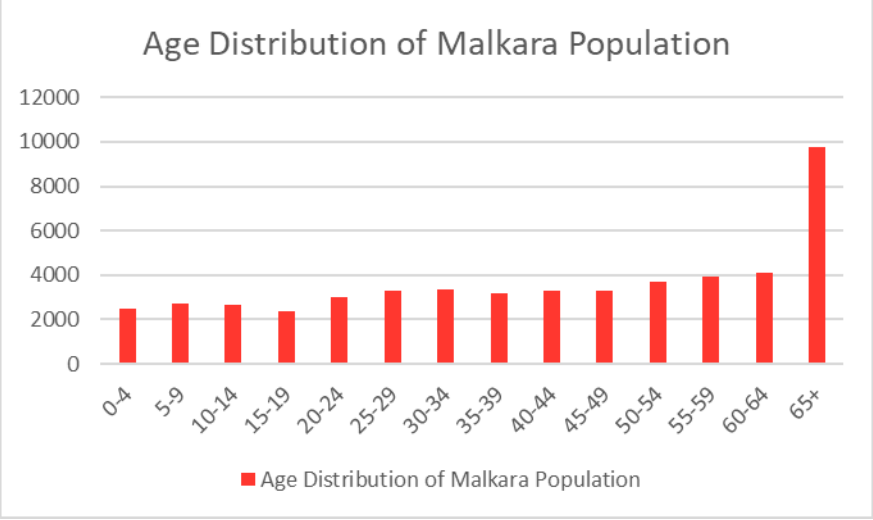
proportions. In Süleymanpaşa, the population aged 65 and older comprised the largest population, with the population aged 20-24 and 40-44 is the second. Yet, apart from those aged 65 and older, the remaining age groups have similar proportions.

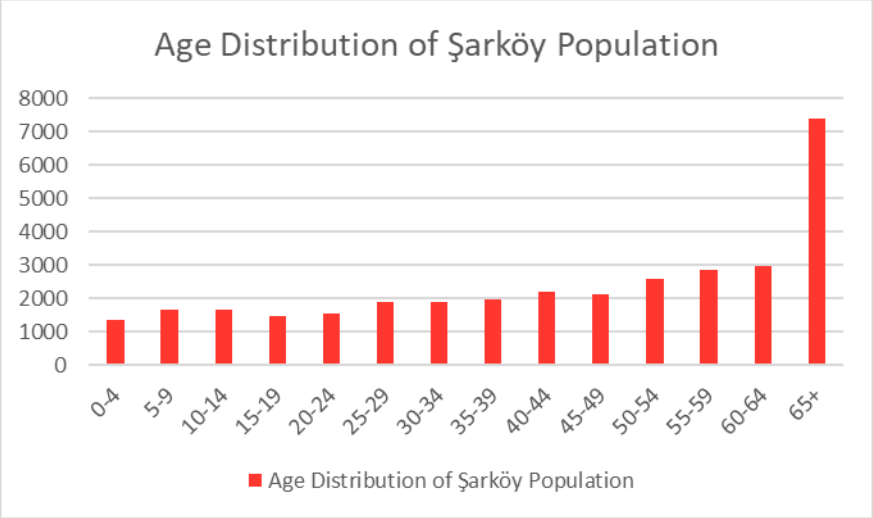
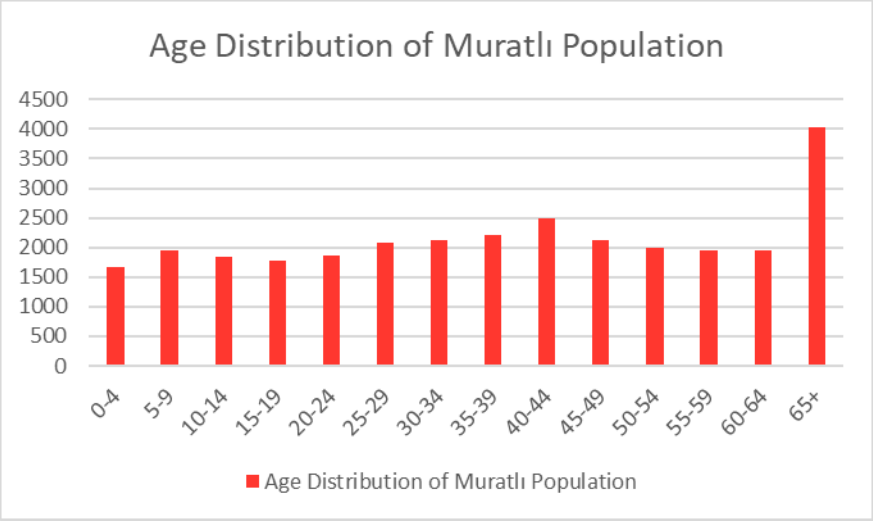
Silivri also has similar trends of age distribution, where younger and middle-aged populations are predominant, with the population aged 65 and older.

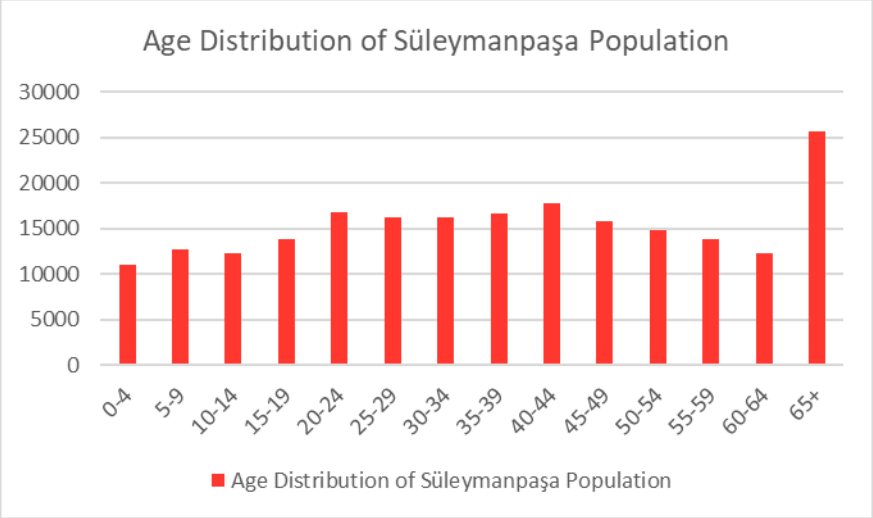
The age distribution of the districts within the AoI of the Project is presented in Table 95.

**Table 95: Age Distributions of the Districts of AoI, as of 2023**

| Province | District | Age Distribution |
|---|---|---|
| **İstanbul** | **Silivri** |  |
| **Tekirdağ** | **Çorlu** |  |

| Province | District | Age Distribution |
|---|---|---|
| | **Marmaraereğlisi** |  |
| | **Malkara** |  |

| Province | District | Age Distribution |
|---|---|---|
| | **Şarköy** |  |
| | **Muratlı** |  |

| Province | District | Age Distribution |
|---|---|---|
| | **Süleymanpaşa** |  |



#### 6.3.1.6.3 Neighbourhood Level

The total population and the number of households in the neighbourhoods are presented in Table 96.

**Table 96: Population Figures of the Settlements within the AoI (2023)**

| Province | District | Neighbourhoods | Population |
|---|---|---|---|
| **İstanbul** | **Silivri** | Alipaşa | 1,020 |
| | | Çanta Balaban | 4,366 |
| | | Çeltik | 6,217 |
| | | Danamandıra | 1,048 |
| | | Değirmenköy (Fevzipaşa) | 1,118 |
| | | Gümüşyaka | 3,506 |
| | | Semizkumlar | 9,555 |
| | | Çanta Sancaktepe | 27,901 |
| | | Yolçatı | 402 |
| **Tekirdağ** | **Çorlu** | Maksutlu | 75 |
| | | Seymen | 560 |
| | | Şahbaz | 1,005 |
| | | Türkgücü | 1,072 |
| | | Yenice | 2,150 |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | 10,426 |
| | | Çiftlikönü (Gündoğdu) | 17,867 |

| Province | District | Neighbourhoods | Population |
|---|---|---|---|
| | | Gazioğlu | 312 |
| | | Güveçli | 86 |
| | | Husunlu | 295 |
| | | İnecik | 552 |
| | | İstiklal (Eskicami) | 811 |
| | | Karaevli | 198 |
| | | Karahisarlı | 202 |
| | | Kayı | 328 |
| | | Kınıklar | 226 |
| | | Köseilyas | 271 |
| | | Mahramlı | 126 |
| | | Nusratfakı | 83 |
| | | Nusratlı | 238 |
| | | Osmanlı | 305 |
| | | Seymenli | 191 |
| | | Yağcı | 518 |
| | | Zafer | 8,382 |
| **Tekirdağ** | **Marmaraereğlisi** | Çeşmeli | 294 |
| | | Türkmenli | 112 |
| | | Yakuplu | 300 |
| **Tekirdağ** | **Malkara** | Ahievren | 119 |
| | | Dereköy | 793 |
| | | Hereke | 382 |
| | | Yenice | 312 |
| **Tekirdağ** | **Muratlı** | Yukarısırt | 68 |
| **Tekirdağ** | **Şarköy** | Tepeköy | 295 |

### *Seasonal Change*

According to the results of the Community Level Surveys, it has been observed that there are seasonal changes in the population of neighbourhoods. The main reason for seasonal population changes in the region has been attributed to increases due to tourism in the summer months. It has been reported that only two neighborhoods have experienced an increase due to seasonal workers, indicating that not many (around 10-15) come to the area during the summer months..

The neighbourhoods where seasonal change occurs presented in Table 97.

**Table 97: Seasonal Population Change in the Neighbourhoods in Last Five Years**

| Province | District | Neighbourhood | Additional Population | Additional number of households | Reason of seasonal population change |
|---|---|---|---|---|---|
| **İstanbul** | **Silivri** | Danamandıra | 1600 | 500 | Tourists coming for summer vacation |
| | | Alipaşa | 0 | 0 | N/A |
| | | Çeltik | 400 | 200 | Tourists coming for summer vacation |
| | | Yolçatı | 1500 | 150 | Tourists coming for summer vacation |
| | | Çanta Sancaktepe | 40000 | 15000 | Tourists coming for summer vacation |
| | | Çanta Balaban | 30000 | N/A | Tourists coming for summer vacation |
| | | Değirmenköy Fevzipaşa | 0 | 0 | N/A |
| | | Gümüşyaka | 2000 | 350 | Tourists coming for summer vacation |
| | | Semizkumlar | 4000 | 150 | Tourists coming for summer vacation |
| **Tekirdağ** | **Çorlu** | Seymen | 0 | 0 | N/A |
| | | Türkgücü | 0 | 0 | N/A |
| | | Şahbaz | 900 | 380 | Tourists coming for summer vacation |
| | | Yenice | 40000 | 5400 | Tourists coming for summer vacation |
| | | Maksutlu | 250 | N/A | Those who work outside the neighbourhood coming for summer vacation |
| **Tekirdağ** | **Marmaraeregli si** | Türkmenli | 750 | N/A | Those who work outside the neighbourhoods coming for summer vacation |
| | | Çeşmeli | 750 | 250 | Tourists coming for summer vacation |
| | | Yakuplu | 500 | 120 | Tourists coming for summer vacation |
| **Tekirdağ** | | Aydoğdu | 0 | 0 | N/A |

| Province | District | Neighbourhood | Additional Population | Additional number of households | Reason of seasonal population change |
|---|---|---|---|---|---|
| | **Süleymanpaşa** | İstiklal (Eskicami) | 200 | 0 | Those who work outside the neighbourhoods coming for summer vacation |
| | | Karaevli | 150 | 30 | N/A |
| | | Karahisarlı | 30 | 4 | - |
| | | Gazioğlu | 280 | 140 | Those who work outside the neighbourhood coming for summer vacation |
| | | Köseilyas | 40 | 15 | Those who work outside the neighbourhood coming for summer vacation |
| | | Husunlu | 100 | N/A | Those who work outside the neighbourhood coming for summer vacation |
| | | Kayı | 0 | 0 | N/A |
| | | Yağcı | 1000 | N/A | Those who work outside the neighbourhood coming for summer vacation |
| | | Osmanlı | 20 | 30 | Those who work outside the neighbourhood coming for summer vacation |
| | | Seymenli | 75 | 18 | Those who work outside the neighbourhood coming for summer vacation |
| | | Güveçli | 20 | 7 | Those who work outside the neighbourhood coming for summer vacation |
| | | Çiftlikönü (Gündoğdu) | 0 | 0 | N/A |
| | | Nusratfakı | 35 | 10 | Those who work outside the neighbourhood coming for summer vacation |
| | | Nusratlı | 90 | 35 | - |

| Province | District | Neighbourhood | Additional Population | Additional number of households | Reason of seasonal population change |
|---|---|---|---|---|---|
| | | İnecik | 220 | 30 | Those who work outside the neighbourhood coming for summer vacation |
| | | Mahramlı | 25 | 5 | Those who work outside the neighbourhood coming for summer vacation |
| | | Kınıklar | 120 | 32 | Those who work outside the neighbourhood coming for summer vacation |
| | | Zafer | 0 | 0 | N/A |
| **Tekirdağ** | **Malkara** | Dereköy | 150 | 60 | Those who work outside the neighbourhood coming for summer vacation |
| | | Yenice | N/A | 5 | Those who work outside the neighbourhood coming for summer vacation |
| | | Hereke | 570 | 120 | Those who work outside the neighbourhood coming for summer vacation |
| | | Ahievren | 500 | 90 | Those who work outside the neighbourhood coming for summer vacation |
| **Tekirdağ** | **Şarköy** | Tepeköy | 50 | 15 | Tourists coming for summer vacation and seasonal workers in the summer months |
| **Tekirdağ** | **Muratlı** | Yukarısırt | 40 | 10 | People come for agricultural production (seasonal workers in the summer months) |

### *Migration*

During the Community Level Surveys, it has been observed that certain neighbourhoods have experienced a change in the population in the last five years.

- In some neighbourhoods, lack of job opportunities and unemployment as well as lack of education opportunities for younger population leaded population decrease,
- In some neighbourhoods, high mortality levels of older population and younger generations migrating to cities caused population decrease,
- Following the Covid-19 pandemic, some neighbourhoods experienced a population increase where retired people returned to rural areas.

The reasons for the population change in the settlements and the target migration group are presented in Table 98.

**Table 98: Population Change in the Neighbourhoods in Last Five Years**

| Province | District | Neighbourhood | Change | Reason of population change | Target population group of change |
|---|---|---|---|---|---|
| **İstanbul** | **Silivri** | Değirmenköy Fevzipaşa | ↑ | Increased by 2000 more people since 2019 due to industrial development | - |
| | | Çeltik | Same | N/A | N/A |
| | | Yolçatı | ↑ | New job opportunities and retirees are returning | Younger population |
| | | Çanta Sancaktepe | ↑ | New job opportunities and retirees are returning | Younger population |
| | | Çanta Balaban | ↑ | New job opportunities and retirees are returning | Younger population |
| | | Gümüşyaka | ↑ | New job opportunities and retirees are returning | Younger population |
| | | Danamandıra | Same | N/A | N/A |
| | | Semizkumlar | ↑ | New job opportunities and immigration from other cities | All population |
| | | Alipaşa | Same | N/A | N/A |
| **Tekirdağ** | **Çorlu** | Seymen | Same | N/A | N/A |
| | | Şahbaz | ↓ | To access education | Younger population |

| Province | District | Neighbourhood | Change | Reason of population change | Target population group of change |
|---|---|---|---|---|---|
| | | Türkgücü | ↑ | New job opportunities and retirees are returning | Younger population |
| | | Yenice | ↑ | New job opportunities and retirees are returning | Younger population |
| | | Maksutlu | Same | N/A | N/A |
| **Tekirdağ** | **Marmaraereğlisi** | Türkmenli | ↑ | New job opportunities and retirees are returning | Older population |
| | | Çeşmeli | ↑ | New job opportunities and retirees are returning | Older population |
| | | Yakuplu | Same | N/A | N/A |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | Same | N/A | N/A |
| | | Karaevli | Same | N/A | N/A |
| | | Gazioğlu | Same | N/A | N/A |
| | | Köseilyas | ↓ | Lack of job opportunities and unemployment | Younger population |
| | | Husunlu | ↑ | New job opportunities and retirees are returning | Older population |
| | | Karahisarlı | Same | N/A | N/A |
| | | Çiftlikönü (Gündoğdu) | ↑ | Receiving migration from İstanbul | Older population |
| | | Kayı | ↑ | New job opportunities and retirees are returning | Older population |
| | | Yağcı | Same | N/A | N/A |
| | | Zafer | ↑ | Construction of new buildings and bus terminal | All population |
| | | İstiklal (Eskicami) | Same | N/A | N/A |
| | | Osmanlı | Same | N/A | N/A |
| | | Seymenli | Same | N/A | N/A |

| Province | District | Neighbourhood | Change | Reason of population change | Target population group of change |
|---|---|---|---|---|---|
| | | Güveçli | ↓ | Mortality and migration | Older and younger population |
| | | Nusratfakı | ↓ | Lack of job opportunities and unemployment | Younger population |
| | | İnecik | ↓ | Mortality and migration | Older and younger population |
| | | Nusratlı | ↓ | To access education | Younger and middle-aged population |
| | | Mahramlı | ↓ | Lack of job opportunities and unemployment | Younger population |
| | | Kınıklar | ↓ | Lack of job opportunities and unemployment | Younger population |
| **Tekirdağ** | **Malkara** | Dereköy | ↓ | Lack of job opportunities and unemployment | Younger population |
| | | Yenice | ↓ | Lack of job opportunities and unemployment | Younger population |
| | | Hereke | ↓ | Mortality and migration | Older and younger population |
| | | Ahievren | Same | N/A | N/A |
| **Tekirdağ** | **Şarköy** | Tepeköy | ↓ | Mortality and decrease in agricultural lands | Older and younger population |
| **Tekirdağ** | **Muratlı** | Yukarısırt | ↑ | Migration from city centres | Older population |

### *6.3.1.7 Land Use Patterns*

#### 6.3.1.7.1 Introduction

Land use patterns allows to understand what type of activities are performed on land and what forms of tenure are common in the AoI. Aim of this section is to reflect existing land use, including residential areas, existing industry, agricultural areas of İstanbul, Silivri. Also, to reflect existing land use, including residential areas, existing industry, agricultural areas of Tekirdağ, Çorlu, Marmaraereğlisi, Süleymanpaşa, Şarköy, Muratlı and Malkara. The information provided in this section was gathered through the available secondary data, GIS studies, in-depth interviews with the Mukhtars and official correspondence from General Directorate of Land Registry and Cadastre.

#### 6.3.1.7.2 Province and District Level

***Land Tenure and Ownership***

The total area of Istanbul is 546,178 hectares. In 2021 and 2022, agricultural land constituted 16.25% of the provincial area. While grassland area accounted for 1.14% of the provincial area in 2021, this ratio increased to 1.21% in 2022, representing a 389-hectare increase.

The size of forest and scrubland areas remained constant in both years, representing 43.58% of the provincial area with 238,030 hectares. Industrial and residential areas covered 36.88% of the provincial area in 2021 with 201,439 hectares, decreasing to 36.81% in 2022 with 201,050 hectares.

The size of lake and reservoir areas remained unchanged in both years, constituting 2.15% of the provincial area with 11,738 hectares.

In conclusion, forested and scrubland areas, along with industrial and residential areas, make up a significant portion of the provincial area in İstanbul. Agricultural areas also account for 16.25% of the total area. Grassland and lake/reservoir areas represent a combined share of 3.36%.

***Land Use Patterns***

The latest information available on land use of İstanbul is based on the 2012-2018 data of CORINE Land Use Classification System. The distribution of land use of İstanbul according to the latest data available is provided in Figure 108.

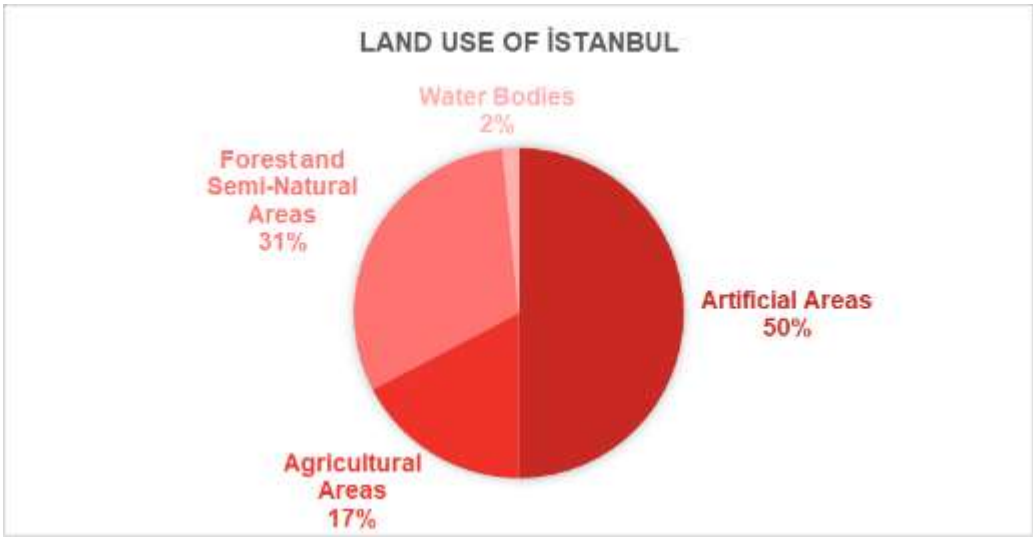



**Figure 108: Land Use of İstanbul**

The latest information available on land use of Tekirdağ is based on the 2018 data of CORINE Land Use Classification System. The distribution of land use of Tekirdağ according to the latest data available is provided in Figure 109.

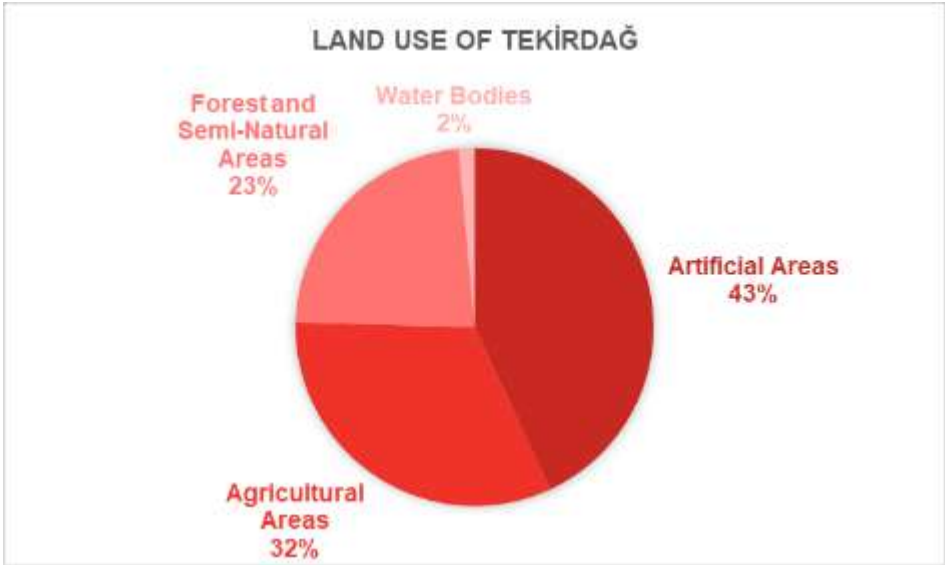



**Figure 109: Land Use of Tekirdağ**

Refer to Table 99 for the detailed land type of the İstanbul Province.

**Table 99: Land Types of İstanbul**

| Layer | Area (ha) | Percent (%) |
|---|---|---|
| Broad Leaf Forests | 180404 | 33.02 |
| Irrigated Arable Lands | 96069.1 | 17.58 |
| Discontinued Rural Settlements | 32200.9 | 5.89 |
| Continuous City Structure | 29378.7 | 5.38 |
| Mixed Agricultural Fields with Natural Vegetation | 27126.5 | 4.96 |
| Plant Exchange Areas | 26897.9 | 4.92 |
| Mixed Forests | 24400.7 | 4.47 |
| Unirrigated Mixed Agricultural Lands | 21754.9 | 3.98 |
| Industrial and Commercial Units | 21573.9 | 3.95 |
| Bodies of Water | 11971.8 | 2.19 |
| Coniferous Forests | 11412.4 | 2.09 |
| Construction Sites | 11399 | 2.09 |
| Pasture Fields | 9192.75 | 1.68 |
| Non-Continuous Settlements | 7325.89 | 1.34 |

| Layer | Area (ha) | Percent (%) |
|---|---|---|
| Mineral Extraction Sites | 6780.5 | 1.24 |
| Highways, Railways and Related Fields | 6054.38 | 1.11 |
| Natural Grasslands | 5096.2 | 0.93 |
| Green City Areas | 4066.31 | 0.74 |
| Sports and Entertainment Areas | 2851.74 | 0.52 |
| Continuously Irrigated Areas | 2302.01 | 0.42 |
| Airports | 1481.16 | 0.27 |
| Unirrigated Fruit Fields | 1341.19 | 0.25 |
| Seas | 1070.66 | 0.2 |
| Rice Fields | 987.5 | 0.18 |
| Beaches, Sands | 880.29 | 0.16 |
| Marshes | 750.15 | 0.14 |
| Ports | 596.02 | 0.11 |
| Waterways | 288.19 | 0.05 |
| Greenhouse Areas in Continuously Irrigated Areas | 259.53 | 0.05 |
| Coastal Lagoons | 226.49 | 0.04 |
| Sparse Plant Areas | 166.81 | 0.03 |
| Discharge Areas | 57.61 | 0.01 |
| Vineyards | 31.74 | 0.01 |

Refer to Table 100 for the detailed land type of the Tekirdağ Province.

**Table 100: Land Types of Tekirdağ**

| Layer | Area (ha) | Percent (%) |
|---|---|---|
| Irrigated Arable Lands | 375989.32 | 60.77 |
| Broad Leaf Forests | 52223.38 | 8.44 |
| Mixed Agricultural Fields with Natural Vegetation | 38899.56 | 6.29 |
| Pasture Fields | 22917.13 | 3.7 |
| Plant Exchange Areas | 22868.7 | 3.7 |

| Layer | Area (ha) | Percent (%) |
|---|---|---|
| Continuously Irrigated Areas | 17861.63 | 2.89 |
| Non-Continuous Settlements | 10879.18 | 1.76 |
| Coniferous Forests | 10756.55 | 1.74 |
| Mixed Forests | 9728.92 | 1.57 |
| Rice Fields | 8043.63 | 1.3 |
| Industrial and Commercial Units | 7536.52 | 1.22 |
| Unirrigated Mixed Agricultural Lands | 7503.88 | 1.21 |
| Discontinued Rural Settlements | 6123.29 | 0.99 |
| Natural Grasslands | 4941.89 | 0.8 |
| Olive groves | 3466.08 | 0.56 |
| Bodies of Water | 3094.91 | 0.5 |
| Mineral Extraction Sites | 2725.72 | 0.44 |
| Vineyards | 2316.99 | 0.37 |
| Waterways | 2127.43 | 0.34 |
| Irrigated Mixed Agricultural Fields | 1943.49 | 0.31 |
| Continuous City Structure | 1719.05 | 0.28 |
| Sparse Plant Areas | 1553.44 | 0.25 |
| Sports and Entertainment Areas | 1100.84 | 0.18 |
| Highways, Railways and Related Fields | 714.3 | 0.12 |
| Sclerophyll Vegetation | 535.06 | 0.09 |
| Airports | 342.9 | 0.06 |
| Discharge Areas | 291.13 | 0.05 |
| Construction Sites | 180.9 | 0.03 |
| Unirrigated Fruit Fields | 174.87 | 0.03 |
| Seas | 127.7 | 0.02 |
| Beaches | 67.99 | 0.01 |

The total land use area in the Silivri District is 86,952 hectares, with 8054 hectares of settlement area. A large part of Silivri District is composed of agricultural lands (61.65%), followed by forest and semi-natural areas lands, artificial lands, and water bodies. Detailed land distribution of the Silivri District is given in Table 101 and Figure 110.

**Table 101: Land Distribution of Silivri District**

| SİLİVRİ DISTRICT LANDUSE QUANTITES (CORINE) | | | |
|---|---|---|---|
| **CLC CODE** | **CLC NAME** | **TOTAL AREA ($m^2$)** | **TOTAL AREA (ha)** |
| 111 | Continuous urban fabric | 1646861.845 | 164,686 |
| 112 | Discontinuous urban fabric | 38596148.749 | 3,859.615 |
| 121 | Industrial or commercial units | 9256218.339 | 925,622 |
| 122 | Road and rail networks and associated land | 6321309.940 | 632,131 |
| 131 | Mineral extraction sites | 6152428.083 | 615,243 |
| 133 | Construction sites | 1756699.378 | 175,670 |
| 142 | Sport and leisure facilities | 2064383.231 | 206,438 |
| 211 | Non-irrigated arable land | 452504816.539 | 45,250.482 |
| 231 | Pastures | 6267786.959 | 626,779 |
| 242 | Complex cultivation patterns | 27307366.989 | 2,730.737 |
| 243 | Land principally occupied by agriculture, with significant areas of natural vegetation | 41126567.444 | 4,112.657 |
| 311 | Broad-leaved forest | 219182047.042 | 21,918.205 |
| 313 | Mixed forest | 6764092.107 | 676,409 |
| 321 | Natural grasslands | 3034057.759 | 303,406 |
| 324 | Transitional woodland-shrub | 35524102.445 | 3,552.410 |
| 411 | Inland marshes | 284187.698 | 28,419 |
| 512 | Water bodies | 965556.768 | 96,556 |
| 523 | Sea and ocean | 3096707.524 | 309,671 |

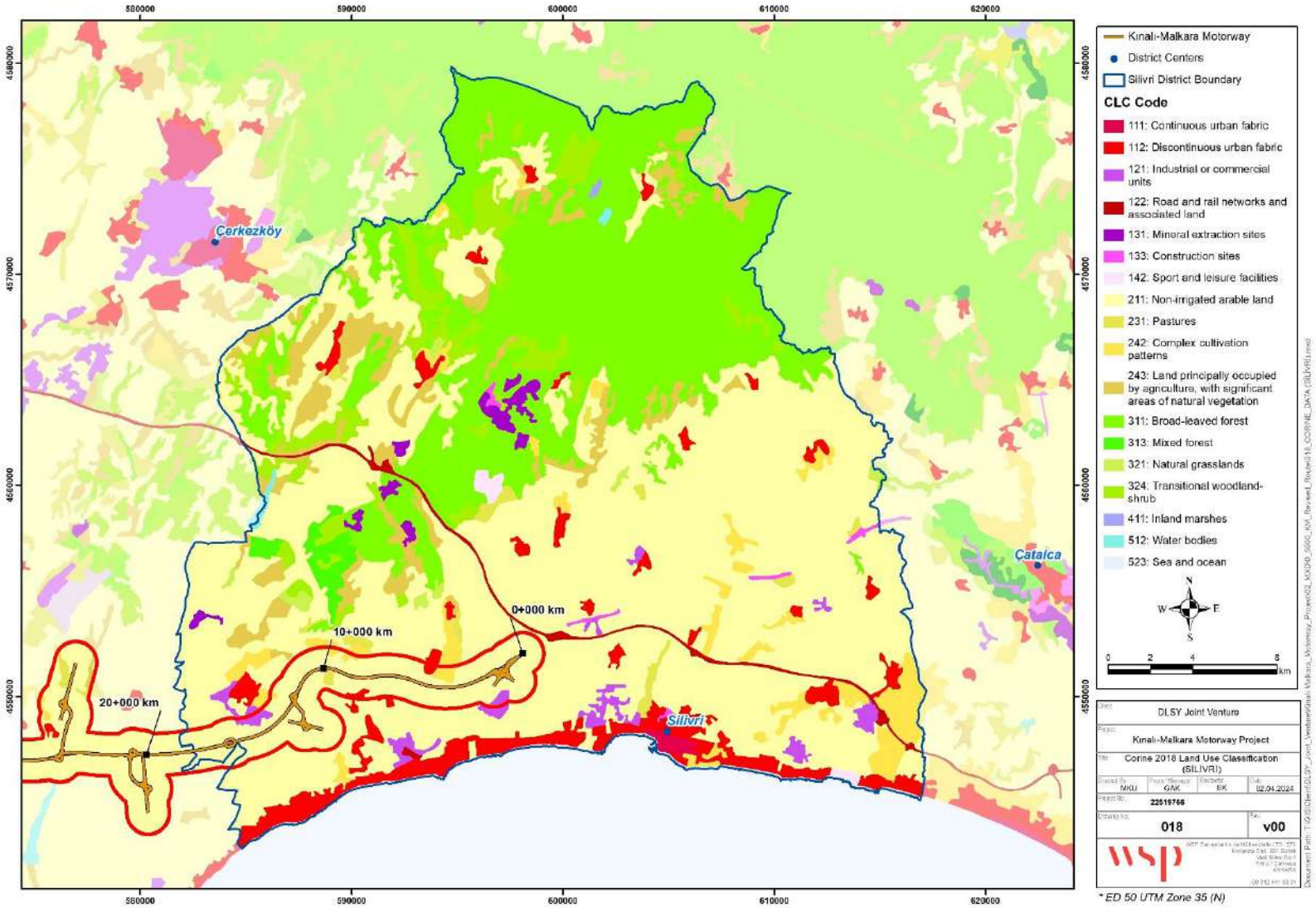



**Figure 110: Land Use of Silivri District**

A large part of Çorlu District is composed of agricultural lands (84.28%), followed by, artificial lands, forest and semi-natural areas lands and water bodies. Detailed land distribution of the Çorlu District is given in the following sections.

**Table 102: Land Distribution of Çorlu District**

| ÇORLU DISTRICT LANDUSE QUANTITES (CORINE) | | | |
|---|---|---|---|
| **CLC CODE** | **CLC NAME** | **TOTAL AREA ($m^2$)** | **TOTAL AREA (ha)** |
| 111 | Continuous urban fabric | 3421551.979 | 342,155 |
| 112 | Discontinuous urban fabric | 30782537.790 | 3,078.254 |
| 121 | Industrial or commercial units | 37363749.110 | 3,736.375 |
| 122 | Road and rail networks and associated land | 5183353.017 | 518,335 |
| 124 | Airports | 3426819.184 | 342,682 |
| 131 | Mineral extraction sites | 4259491.646 | 425,949 |
| 142 | Sport and leisure facilities | 1296428.354 | 129,643 |
| 211 | Non-irrigated arable land | 686268111.400 | 68,626.811 |
| 212 | Permanently irrigated land | 8073779.179 | 807,378 |
| 231 | Pastures | 47375624.630 | 4,737.562 |
| 242 | Complex cultivation patterns | 5598604.726 | 559,860 |
| 243 | Land principally occupied by agriculture, with significant areas of natural vegetation | 30126051.730 | 3,012.605 |
| 311 | Broad-leaved forest | 4468197.300 | 446,820 |
| 321 | Natural grasslands | 1367342.345 | 136,734 |
| 324 | Transitional woodland-shrub | 21079399.040 | 2,107.940 |
| 411 | Inland marshes | 1409706.212 | 140,971 |
| 511 | Water courses | 4106785.136 | 410,679 |
| 512 | Water bodies | 807528.920 | 80,753 |
| 523 | Sea and ocean | 403309.387 | 40,331 |

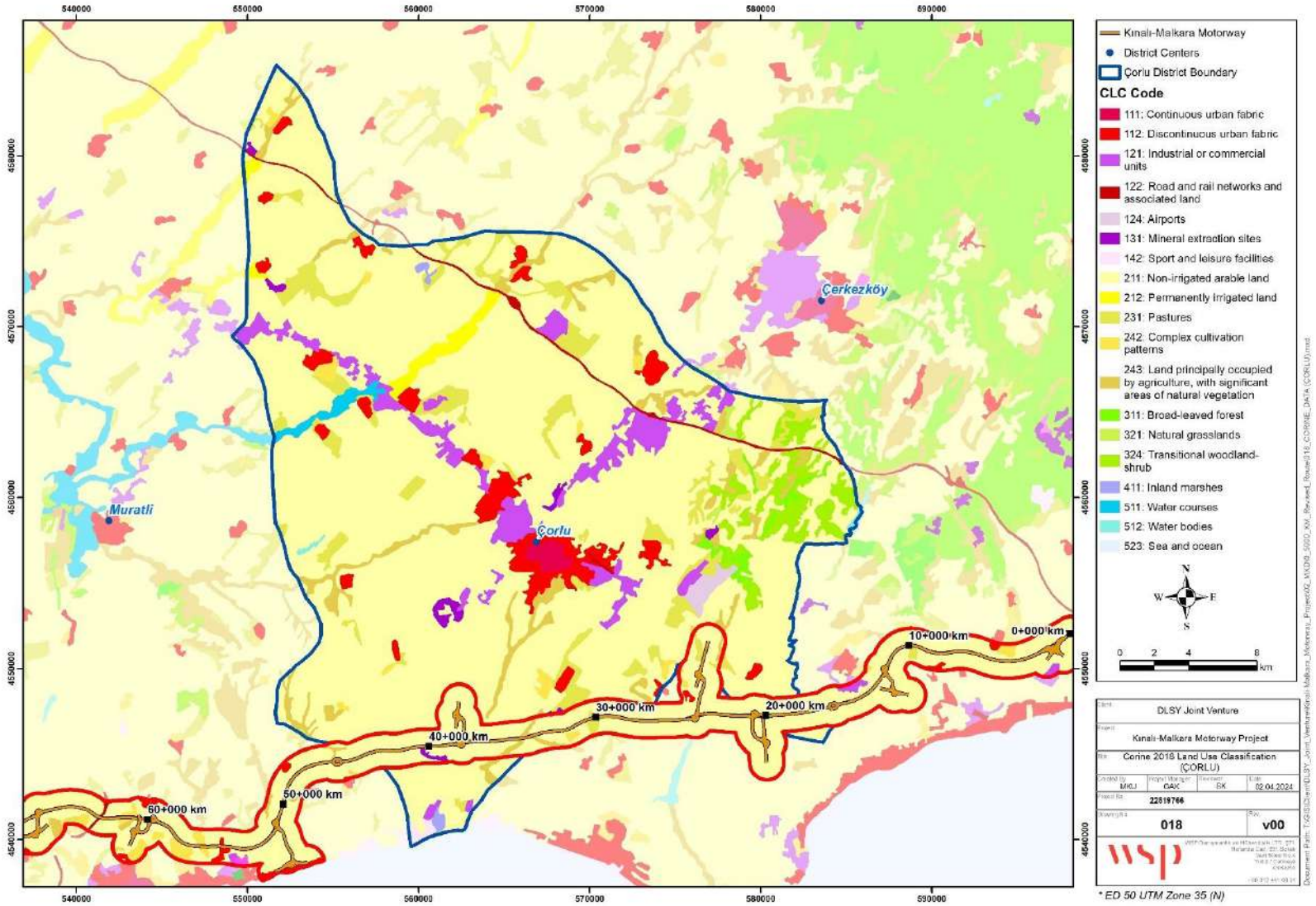



**Figure 111: Land Use of Çorlu District**

A large part of Marmaraereğlisi District is composed of agricultural lands (86.23%), followed by water bodies, artificial lands, and forest and semi-natural areas. Detailed land distribution of the Marmaraereğlisi District is given in the following sections.

**Table 103: Land Distribution of Marmaraereğlisi District**

| MARMARAEREĞLİSİ DISTRICT LANDUSE QUANTITES (CORINE) | | | |
|---|---|---|---|
| **CLC CODE** | **CLC NAME** | **TOTAL AREA ($m^2$)** | **TOTAL AREA (ha)** |
| 112 | Discontinuous urban fabric | 13828646.898 | 1,382.865 |
| 121 | Industrial or commercial units | 2388292.207 | 238,829 |
| 142 | Sport and leisure facilities | 7364158.667 | 736,416 |
| 211 | Non-irrigated arable land | 145889273.976 | 14,588.927 |
| 231 | Pastures | 1835037.572 | 183,504 |
| 242 | Complex cultivation patterns | 7056828.343 | 705,683 |
| 243 | Land principally occupied by agriculture, with significant areas of natural vegetation | 4331175.652 | 433,118 |
| 512 | Water bodies | 1790206.948 | 179,021 |
| 523 | Sea and ocean | 2467770.251 | 246,777 |

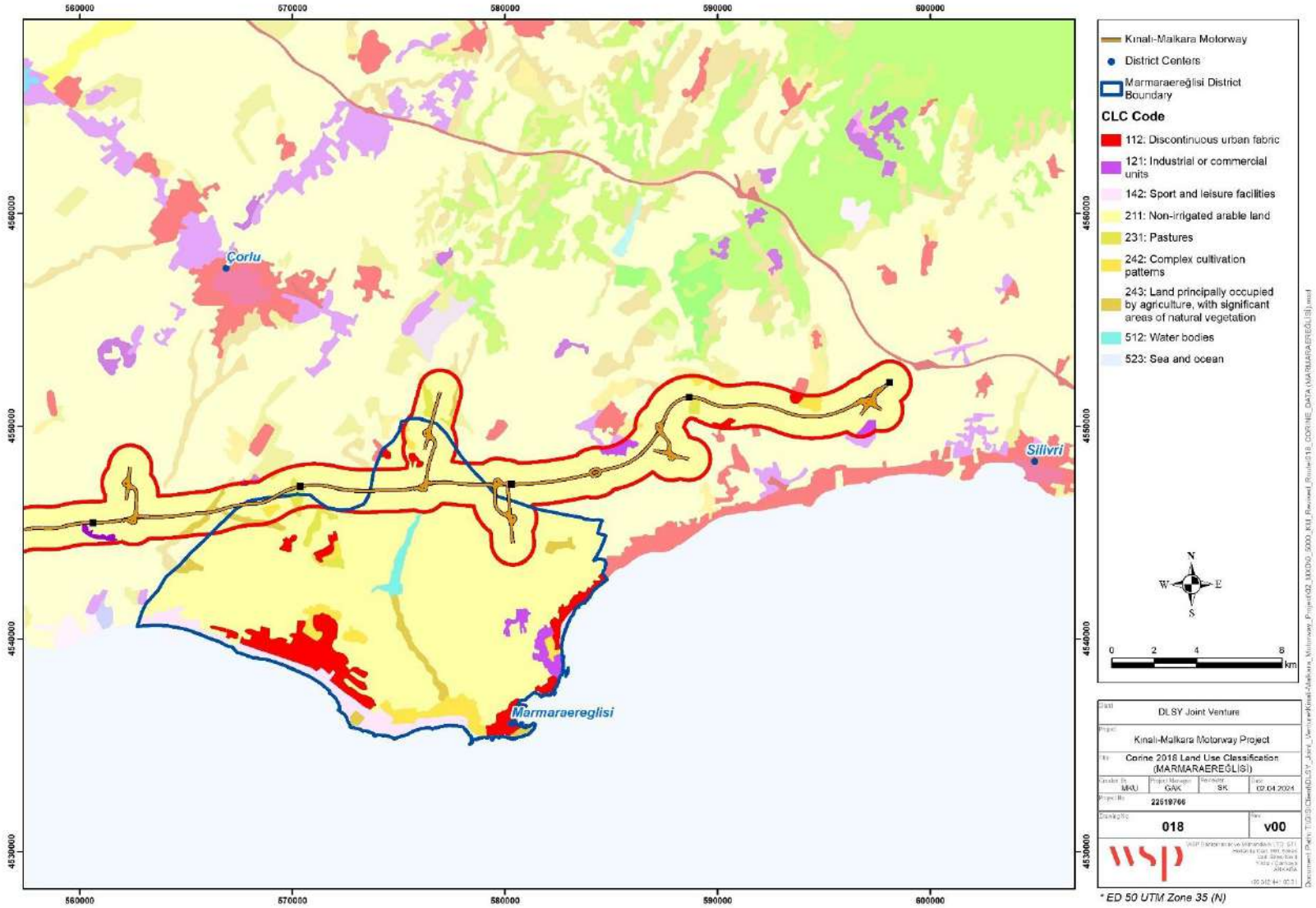



**Figure 112: Land Use of Marmaraereğlisi District**

A large part of Süleymanpaşa District is composed of agricultural lands (82.08%), followed by forest and semi-natural areas, artificial lands, and water bodies. Detailed land distribution of the Süleymanpaşa District is given in the following sections.

**Table 104: Land Distribution of Süleymanpaşa District**

| SÜLEYMANPAŞA DISTRICT LANDUSE QUANTITES (CORINE) | | | |
|---|---|---|---|
| **CLC CODE** | **CLC NAME** | **TOTAL AREA ($m^2$)** | **TOTAL AREA (ha)** |
| 111 | Continuous urban fabric | 3505375.257 | 350,538 |
| 112 | Discontinuous urban fabric | 33464768.322 | 3,346.477 |
| 121 | Industrial or commercial units | 6652704.259 | 665,270 |
| 122 | Road and rail networks and associated land | 1102314.946 | 110,231 |
| 123 | Port areas | 8442.276 | 0,844 |
| 131 | Mineral extraction sites | 2129980.562 | 212,998 |
| 133 | Construction sites | 1174687.573 | 117,469 |
| 142 | Sport and leisure facilities | 2329438.897 | 232,944 |
| 211 | Non-irrigated arable land | 671576519.361 | 67,157.652 |
| 212 | Permanently irrigated land | 18820670.811 | 1,882.067 |
| 213 | Rice fields | 291244.099 | 29,124 |
| 221 | Vineyards | 1257817.520 | 125,782 |
| 231 | Pastures | 30188994.234 | 3,018.899 |
| 242 | Complex cultivation patterns | 22044911.700 | 2,204.491 |
| 243 | Land principally occupied by agriculture, with significant areas of natural vegetation | 92063979.179 | 9,206.398 |
| 311 | Broad-leaved forest | 63938467.614 | 6,393.847 |
| 312 | Coniferous forest | 17114027.268 | 1,711.403 |
| 321 | Natural grasslands | 3295391.448 | 329,539 |
| 324 | Transitional woodland-shrub | 30020680.977 | 3,002.068 |
| 333 | Sparsely vegetated areas | 1900826.743 | 190,083 |
| 512 | Water bodies | 3024608.094 | 302,461 |
| 523 | Sea and ocean | 1440924.554 | 144,092 |

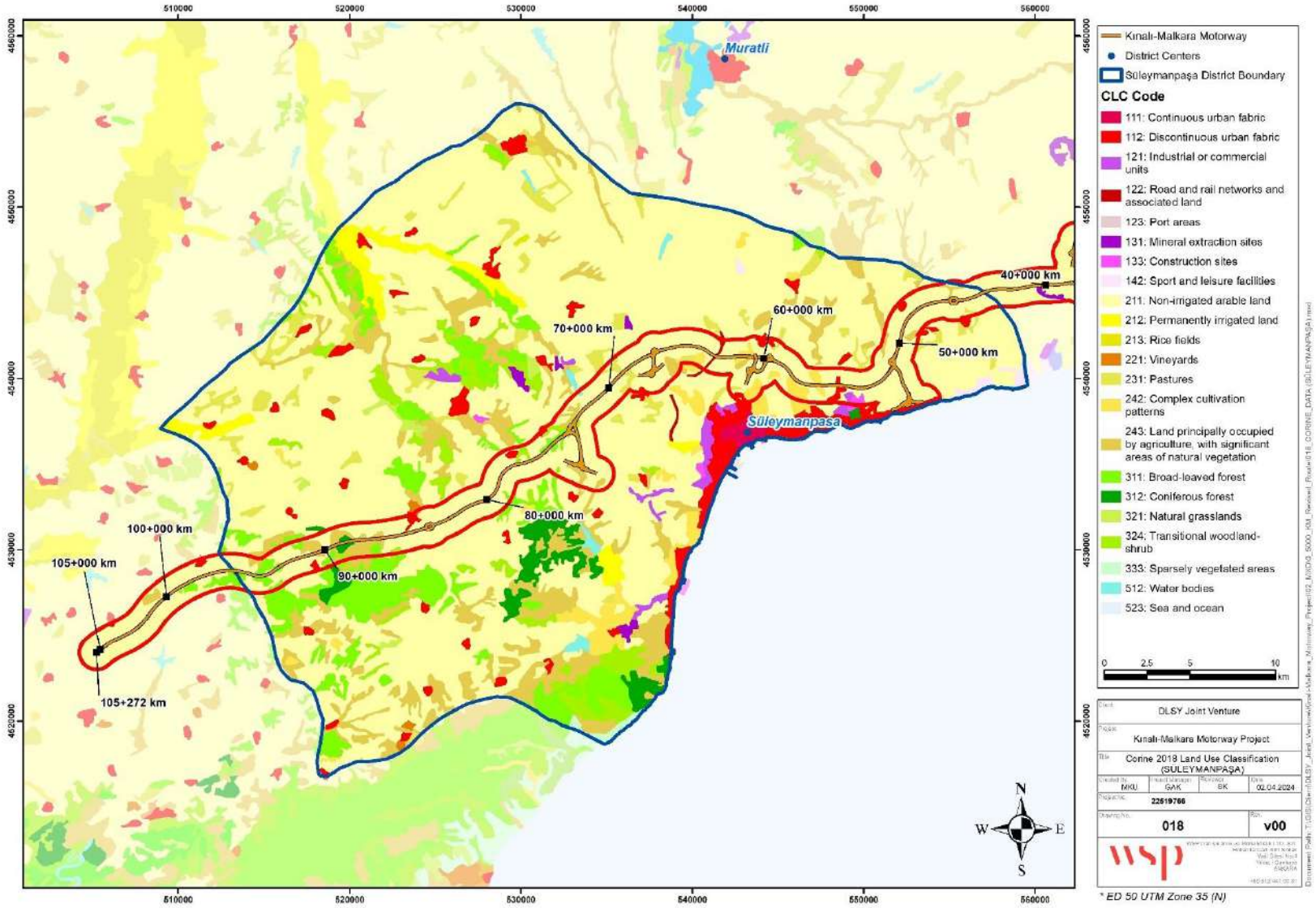



**Figure 113: Land Use of Süleymanpaşa District**

A large part of Şarköy District is composed of forest and semi-natural areas (53.48%), followed by agricultural lands, artificial lands, and water bodies. Detailed land distribution of the Şarköy District is given in the following sections.

**Table 105: Land Distribution of Şarköy District**

| ŞARKÖY DISTRICT LANDUSE QUANTITES (CORINE) | | | |
|---|---|---|---|
| **CLC CODE** | **CLC NAME** | **TOTAL AREA ($m^2$)** | **TOTAL AREA (ha)** |
| 111 | Continuous urban fabric | 1937788.668 | 193,779 |
| 112 | Discontinuous urban fabric | 6743629.599 | 674,363 |
| 121 | Industrial or commercial units | 8855.629 | 0,886 |
| 142 | Sport and leisure facilities | 1244528.580 | 124,453 |
| 211 | Non-irrigated arable land | 59463279.950 | 5,946.328 |
| 212 | Permanently irrigated land | 1068061.491 | 106,806 |
| 221 | Vineyards | 21042858.038 | 2,104.286 |
| 222 | Fruit trees and berry plantations | 552227.676 | 55,223 |
| 223 | Olive groves | 34820306.773 | 3,482.031 |
| 231 | Pastures | 1192109.681 | 119,211 |
| 242 | Complex cultivation patterns | 26055482.543 | 2,605.548 |
| 243 | Land principally occupied by agriculture, with significant areas of natural vegetation | 82283931.232 | 8,228.393 |
| 311 | Broad-leaved forest | 115930398.084 | 11,593.040 |
| 312 | Coniferous forest | 46598164.105 | 4,659.816 |
| 313 | Mixed forest | 41172589.466 | 4,117.259 |
| 321 | Natural grasslands | 10481343.186 | 1,048.134 |
| 323 | Sderophyllous vegetation | 5448193.808 | 544,819 |
| 324 | Transitional woodland-shrub | 58424690.681 | 5,842.469 |
| 331 | Beaches, dunes, sands | 682945.986 | 68,295 |
| 333 | Sparsely vegetated areas | 13469499.950 | 1,346.950 |
| 512 | Water bodies | 5387848.630 | 538,785 |
| 523 | Sea and ocean | 3175881.574 | 317,588 |

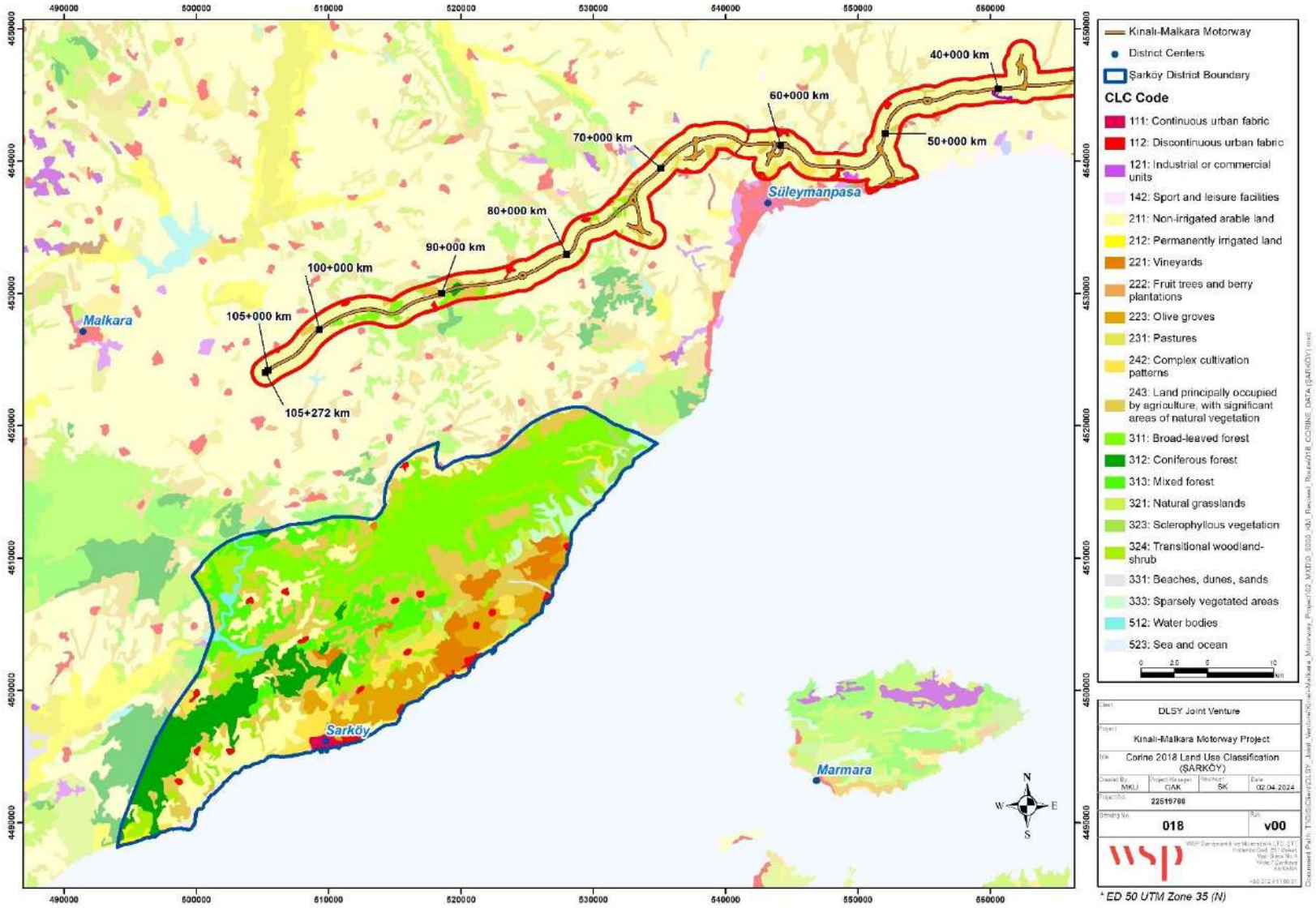



**Figure 114: Land Use of Şarköy District**

A large part of Malkara District is composed of agricultural lands (73.99%), forest and semi-natural areas followed by, artificial lands, and water bodies. Detailed land distribution of the Malkara District is given in the following sections.

**Table 106: Land Distribution of Malkara District**

| MALKARA DISTRICT LANDUSE QUANTITES (CORINE) | | | |
|---|---|---|---|
| **CLC CODE** | **CLC NAME** | **TOTAL AREA (m2)** | **TOTAL AREA (ha)** |
| 112 | Discontinuous urban fabric | 29903006.354 | 2,990.301 |
| 121 | Industrial or commercial units | 4444097.635 | 444,410 |
| 131 | Mineral extraction sites | 17363870.568 | 1,736.387 |
| 132 | Dump sites | 2927042.389 | 292,704 |
| 211 | Non-irrigated arable land | 734821084.276 | 73,482.108 |
| 212 | Permanently irrigated land | 48842676.746 | 4,884.268 |
| 213 | Rice fields | 12801896.110 | 1,280.190 |
| 221 | Vineyards | 919925.976 | 91,993 |
| 222 | Fruit trees and berry plantations | 417543.762 | 41,754 |
| 231 | Pastures | 39286056.432 | 3,928.606 |
| 242 | Complex cultivation patterns | 8701218.661 | 870,122 |
| 243 | Land principally occupied by agriculture, with significant areas of natural vegetation | 72261543.220 | 7,226.154 |
| 311 | Broad-leaved forest | 87676009.308 | 8,767.601 |
| 312 | Coniferous forest | 40329568.281 | 4,032.957 |
| 313 | Mixed forest | 49407768.752 | 4,940.777 |
| 321 | Natural grasslands | 6977175.125 | 697,718 |
| 324 | Transitional woodland-shrub | 51916987.426 | 5,191.699 |
| 512 | Water bodies | 16241435.745 | 1,624.144 |

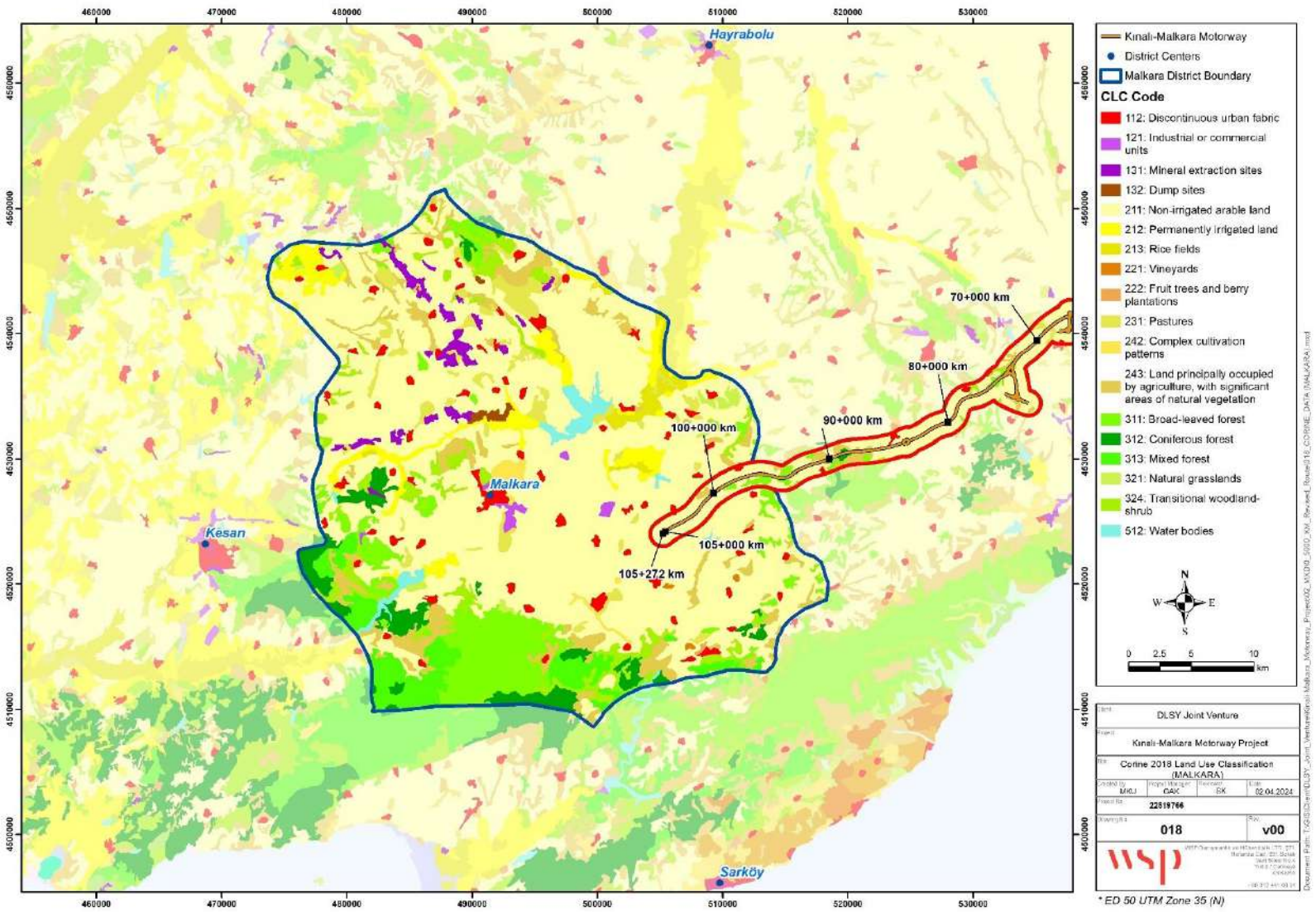



**Figure 115: Land use of Malkara District**

#### 6.3.1.7.3 Neighbourhood Level

Secondary data sources do not provide sufficient information about land use data at neighbourhood level. In the interviews with the Mukhtars also did not provide a reliable information on land use and distribution. Therefore, information at the neighbourhood level could not be provided.

According to the preliminary data provided by the Client regarding the land acquisition and expropriation process for the Project, which is planned to be conducted in three stages:

- Package 1: KM 70-105
- Package 2: KM: 0-35
- Package 3: KM: 35-70

The expropriation plans for Package 1 have already been submitted to the relevant cadastre directorates for cadastral technical controls.

In this section, the land acquisition and expropriation requirements for Package 1 are presented. A total of 560 parcels, covering an area of 4,499,838.05 m², will be acquired through expropriation. The parcels are classified as private and corporate lands (agricultural lands), legal entity lands belonging to institutions, treasury lands, meadow land, forest land, unregistered land, and road and stream. The detailed classification of parcel types is provided in Table 107.

**Table 107: Project Affected Lands by Type**

| Type of the Land | Number of Affected Parcels | Total Area $m^2$ |
|---|---|---|
| Private – Corporate Land | 438 | 3,097,481.47 |
| Legal Entity Land (Institutions) | 9 | 70,743.41 |
| Treasury Land | 21 | 17,976.42 |
| Meadow Land | 7 | 247,661.53 |
| Forest Land | 27 | 923,514.14 |
| Unregistered Land | 17 | 59344 |
| Road – Stream | 41 | 83117 |
| **Total** | **560** | **4,499,838.05** |

The private parcels, owned by individuals and companies, are presented in Table 108. In the Süleymanpaşa district, the affected settlements include Seymenli, Güveçli, Nusratlı, Karahisarlı, Nusratfakı, İnecik, Akçahalil, and Kınıklar. These settlements collectively encompass 328 parcels, impacting a total of 926 landowners. In the Malkara district, the impacted settlements are Yenice, Hereke, and Ahievren. These settlements account for 110 parcels and 83 landowners in total.

**Table 108: Project Affected Private Lands by Settlement**

| Province | District | Settlement | Expropriation Package | Number of Affected Parcels (private and corporate) | Number of landowners |
|---|---|---|---|---|---|
| Tekirdağ | Süleymanpaşa | Seymenli | Package 1 | 42 | 166 |
| | | Güveçli | Package 1 | 39 | 101 |
| | | Nusratlı | Package 1 | 27 | 83 |
| | | Karahisarlı | Package 1 | 17 | 85 |
| | | Nusratfakı | Package 1 | 47 | 114 |
| | | İnecik | Package 1 | 96 | 257 |
| | | Akçahalil | Package 1 | 54 | 11 |
| | | Kınıklar | Package 1 | 6 | 109 |
| | Malkara | Yenice | Package 1 | 37 | 58 |
| | | Hereke | Package 1 | 30 | 63 |
| | | Ahievren | Package 1 | 43 | 81 |
| **Total** | | | | **438** | **1009** |

Other affected parcels for Package 1 are presented in Table 109.

**Table 109: Project Affected Non-Private Parcels**

| District | Settlement | Legal Entity Land (Institutions) | Treasury Land | Meadow Land | Forest Land | Unregistered Land | Road – Stream |
|---|---|---|---|---|---|---|---|
| Süleymanpaşa | Seymenli | 4 | 7 | 2 | 5 | 2 | 2 |
| | Güveçli | - | - | 1 | 2 | - | 3 |
| | Nusratlı | - | 4 | - | - | - | 1 |
| | Karahisarlı | 1 | - | - | 1 | 2 | 2 |
| | Nusratfakı | - | 4 | 2 | - | 2 | 7 |
| | İnecik | 2 | 2 | 2 | 4 | 2 | 6 |
| | Akçahalil | 1 | 1 | - | 8 | - | 5 |
| | Kınıklar | - | 2 | - | 4 | - | 2 |
| Malkara | Yenice | 1 | 1 | - | 3 | 5 | 2 |
| | Hereke | - | - | - | - | 2 | 7 |
| | Ahievren | - | - | - | - | 2 | 4 |

| District | Settlement | Legal Entity Land (Institutions) | Treasury Land | Meadow Land | Forest Land | Unregistered Land | Road – Stream |
|---|---|---|---|---|---|---|---|
| Total | | 9 | 21 | 7 | 27 | 17 | 41 |

Table 110 presents the total number of affected parcels and their respective areas (in m²) across various settlements within the Tekirdağ province for Package 1 of the expropriation process.

**Table 110: Total Number of Affected Parcels and Total Area by Settlement**

| Province | District | Settlement | Expropriation Package | Total Number of Affected Parcels | Total Area $m^2$ |
|---|---|---|---|---|---|
| Tekirdağ | Süleymanpaşa | Seymenli | Package 1 | 64 | 802,216.36 |
| | | Güveçli | Package 1 | 45 | 300,864.05 |
| | | Nusratlı | Package 1 | 32 | 144,401.50 |
| | | Karahisarlı | Package 1 | 23 | 147,484.09 |
| | | Nusratfakı | Package 1 | 62 | 525,260.43 |
| | | İnecik | Package 1 | 114 | 863,349.77 |
| | | Akçahalil | Package 1 | 69 | 569,901.47 |
| | | Kınıklar | Package 1 | 14 | 156,009.41 |
| | Malkara | Yenice | Package 1 | 49 | 466,507.56 |
| | | Hereke | Package 1 | 39 | 333,038.94 |
| | | Ahievren | Package 1 | 49 | 190,804.47 |
| **Total** | | | | **560** | 4,499,838.05 |

The expropriation and land acquisition details for other sections of the motorway have not yet been determined. Information regarding these areas will be provided in future stages of the Project. Additionally, the impacts related to resettlement have not been assessed at this stage.

### *6.3.1.8 Economy and Livelihoods*

#### 6.3.1.8.1 Introduction

This section of the report represents primary and secondary economic activities, ecosystem service usage baseline data gathered trough the reports of the Trakya Development Agency, İstanbul Development Agency (İSTKA) and the community-level and household surveys. Economy and employment are key social components to understand the livelihood conditions of the local community and of the economic trends that are occurring. In this section, economy, and employment trends of both İstanbul and Tekirdağ provinces and districts of Malkara, Çorlu, Şarköy, Süleymanpaşa, Muratlı and Marmaraereğlisi in Tekirdağ and Silivri in İstanbul are presented.

#### 6.3.1.8.2 Province and District Level

### *Economic activities and sectors*

#### İstanbul

In İstanbul, the economic structure is diverse and dynamic, with a strong emphasis on industry, manufacturing, and the service sector. İstanbul serves as the economic hub of Türkiye, contributing significantly to Türkiye's GDP. The province is a metropolis that hosts various economic activities in its surrounding districts.

In Silivri, the service sector plays a significant role, catering to both residents and visitors. The district hosts a range of services, including retail, hospitality, healthcare, and education. With its strategic location and proximity to İstanbul, Silivri is a commercial and logistical centre, facilitating trade and commerce.

Tourism-related activities, such as hospitality services, restaurants, and recreational facilities, contribute to the district's economy. In addition to the service sector, agriculture also plays a notable role in Silivri's economy. Specifically, Silivri is known for its agricultural products, including grains like wheat and barley, as well as vegetables such as tomatoes, peppers, and cucumbers. The district's agricultural production not only fulfils local demand but also supplies markets in İstanbul and beyond. Also, Silivri's coastal location enables fishing activities.

While Silivri is primarily known for its agricultural and tourism sectors, it also hosts a variety of industrial activities. Industrial zones and manufacturing facilities in Silivri play a role in supporting the local economy and providing employment opportunities. The industrial sector contains diverse industries such as food processing, textiles, manufacturing, and logistics. Factories and industrial facilities in the district are involved in the production of various goods, including food products, textiles, plastics, and construction materials.

#### Tekirdağ

The three primary sectors that mark the economic structure of Tekirdağ Province are industry, manufacturing, and service sector; followed by agriculture and animal husbandry as the secondary sectors. The predominant economic sector in the Süleymanpaşa and Çorlu districts is service sector in general. Marmaraereğlisi is marked by service sector based on tourism. In Şarköy, along with the predominance of service sector based on tourism, agricultural production is another primary economic activity.

The lands of Tekirdağ Province are very fertile and are regarded as Grade 1 agricultural land. The main agricultural products in Tekirdağ are sunflower and wheat. Parallel to this, flour and oil industry is highly developed in the province. Tekirdağ meets the majority of Türkiye's sunflower oil and wheat production. Especially in Malkara District, the primary economic activities are agriculture and animal husbandry.

Apart from wheat and sunflower, other main agricultural products are 2500 cherry trees (50 thousand throughout the province) and dry onions in the central district. 60% of the onions produced in the province are produced in the central district.

### *Employment*

#### İstanbul

As of 2023, the labour force participation rate of TR10 (İstanbul) Region was 57%, and the employment rate was 51.9%. The unemployment rate for the TR10 region stands at 8.9% in 2023 (TURKSTAT, 2023). These statistics reflect the dynamics of the labour market in İstanbul, where the labour force participation and employment rates are lower than in the TR21 region (Tekirdağ, Edirne, Kırklareli), but the unemployment rate is higher. This data suggests

that while İstanbul has a significant portion of the population active in the labour market, there are challenges related to employment opportunities, especially for female population.

**Table 111: TR10 (İstanbul) Labour Force Indicators**

| TR10 | Total | Male | Female |
|---|---|---|---|
| **Labour force participation rate (%)** | 57 | 74.9 | 39.5 |
| **Employment rate (%)** | 51.9 | 69.3 | 34.9 |
| **Unemployment rate (%)** | 8.9 | 7.4 | 11.7 |

*Source: TURKSTAT, 2023*

### Tekirdağ

As of 2023, the labour force participation rate of TR21 (Tekirdağ, Edirne, Kırklareli) Region was 59%, and the employment rate was 54.5%, which are both the highest labour force participation and employment rates in Türkiye in general (TURKSTAT, 2023). The unemployment rate of TR21 region (Tekirdağ, Edirne, Kırklareli) is 7.6% in 2023 (TURKSTAT, 2023).

**Table 112: TR21 (Tekirdağ, Edirne, Kırklareli) Labour Force Indicators**

| TR21 | Total | Male | Female |
|---|---|---|---|
| **Labour force participation rate (%)** | 59 | 76.5 | 40.9 |
| **Employment rate (%)** | 54.5 | 71.8 | 36.7 |
| **Unemployment rate (%)** | 7.6 | 6.2 | 10.3 |

*Source: TURKSTAT, 2023*

#### 6.3.1.8.3 Neighbourhood Level

Information on the economic structure of the neighbourhood in the Project AoI is presented in this section. The main components of the economic system are average household income, main economic sectors, animal husbandry and agricultural production. The data on these components are obtained through the surveys.

Average household income in neighbourhoods and changes purchasing power in the last five years and the reasons behind the change are provided in Table 113.

**Table 113: Average Household Income and purchasing power change in Neighbourhoods**

| Province | District | Neighbourhood | Average household income (TRY) | Changes in purchasing power in the last five year | Reasons of change |
|---|---|---|---|---|---|
| **İstanbul** | **Silivri** | Danamandıra | 17,000 | Same | N/A |
| | | Alipaşa | 15,000 (2024) | ↓ | - |
| | | Çeltik | 10,000 | Same | N/A |
| | | Yolçatı | 6,500 | Same | N/A |

| Province | District | Neighbourhood | Average household income (TRY) | Changes in purchasing power in the last five year | Reasons of change |
|---|---|---|---|---|---|
| | | Çanta Sancaktepe | 8,500 | ↓ | High inflation |
| | | Çanta Balaban | 15,000 | ↓ | High inflation |
| | | Değirmenköy (Fevzipaşa) | 17,000 | ↓ | High inflation |
| | | Gümüşyaka | 8,500 | ↓ | High inflation |
| | | Semizkumlar | 20,000 (2024) | ↓ | High inflation and increased living cost |
| **Tekirdağ** | **Çorlu** | Seymen | 10,000 | Same | N/A |
| | | Şahbaz | 9,000 | ↓ | High inflation |
| | | Türkgücü | 12,000 | ↓ | High inflation |
| | | Yenice | 15,000 | ↓ | High inflation |
| | | Maksutlu | 8,000 | Same | N/A |
| **Tekirdağ** | **Marmaraereğlisi** | Türkmenli | 8,500 | ↓ | High inflation |
| | | Çeşmeli | 15,000 | ↓ | High inflation |
| | | Yakuplu | 10,000 | Same | N/A |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | N/A | N/A | N/A |
| | | İstiklal (Eskicami) | 17,000 | N/A | N/A |
| | | Karaevli | N/A | ↓ | High inflation |
| | | Gazioğlu | 8,500 | ↓ | High inflation |
| | | Karahisarlı | 30,000 (2024) | ↓ | High inflation and increased value of agricultural raw material |
| | | Köseilyas | 5,000 | ↓ | High inflation |
| | | Husunlu | 7,000 | Same | N/A |
| | | Kayı | 17,000 | ↑ | Increased value of agricultural products (sales increase) |
| | | Yağcı | 12,000 | ↓ | High inflation |
| | | Zafer | 25,000 (2024) | Same | N/A |

| Province | District | Neighbourhood | Average household income (TRY) | Changes in purchasing power in the last five year | Reasons of change |
|---|---|---|---|---|---|
| | | Osmanlı | 6,500 | ↑ | Increased value of agricultural products (sales increase) |
| | | Seymenli | 8,500 | ↑ | Increased value of agricultural products (sales increase) |
| | | Güveçli | 8,500 | ↓ | High inflation |
| | | Çiftlikönü (Gündoğdu) | 35,000 | ↓ | Increased living cost |
| | | Nusratfakı | 10,000 | Same | N/A |
| | | Nusratlı | 25,000 (2024) | ↓ | Increased value of agricultural raw material and drought |
| | | İnecik | 15,000 | ↓ | High inflation |
| | | Mahramlı | 12,500 (2024) | ↓ | Decrease in animal husbandry |
| | | Kınıklar | 10,000 | Same | N/A |
| **Tekirdağ** | **Muratlı** | Yukarısırıt | 40,000 (2024) | ↓ | High inflation |
| **Tekirdağ** | **Malkara** | Dereköy | 10,000 | Same | N/A |
| | | Yenice | 10,000 | Same | N/A |
| | | Hereke | 15,000 (2024) | Same | N/A |
| | | Ahievren | 12,000 | ↑ | New workplaces opened |
| **Tekirdağ** | **Şarköy** | Tepeköy | 15,000 | ↓ | Increased value of agricultural raw material, decreased agricultural land. |

## Economic Activities

The primary, secondary and tertiary income sources of the neighbourhoods located in the Project AoI are given in the Table 114.

**Table 114: Income Sources of the Neighbourhoods of the AoI**

| Province | District | Neighbourhood | Primary Income Source | Secondary Income Source | Tertiary Income Source |
|---|---|---|---|---|---|
| **İstanbul** | **Silivri** | Değirmenköy Fevzipaşa | Agricultural production | Animal Husbandry | Construction and industry |
| | | Alipaşa | Agricultural production | Animal husbandry | Retirement pension |
| | | Çeltik | Agricultural production | Animal Husbandry | Trade |
| | | Yolçatı | Agricultural production | Forestry | Beekeeping |
| | | Çanta Sancaktepe | Construction and industrial labour | Agricultural production | Animal Husbandry |
| | | Çanta Balaban | Retirement pension | Agricultural production | Tourism |
| | | Gümüşyaka | Agricultural production | Animal Husbandry | Trade |
| | | Danamandıra | Agricultural production | Animal Husbandry | Retirement pension |
| | | Semizkumlar | Trade | Construction and industry | Retirement pension |
| **Tekirdağ** | **Çorlu** | Seymen | Agricultural production | Animal Husbandry | Beekeeping |
| | | Şahbaz | Agricultural production | Animal Husbandry | Retirement pension |
| | | Türkgücü | Agricultural production | Retirement pension | Trade |
| | | Yenice | Agricultural production | Animal Husbandry | Retirement pension |
| | | Maksutlu | Agricultural production | Beekeeping | Animal Husbandry |
| **Tekirdağ** | **Marmaraereğlisi** | Türkmenli | Agricultural production | Animal Husbandry | Retirement pension |
| | | Yakuplu | Agricultural production | Retirement pension | Animal Husbandry |
| | | Çeşmeli | Agricultural production | Animal Husbandry | Retirement pension |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | Wage labour | Social pensions | Daily wage labour |

| Province | District | Neighbourhood | Primary Income Source | Secondary Income Source | Tertiary Income Source |
|---|---|---|---|---|---|
| | | Karaevli | Agricultural production | Animal Husbandry | Retirement pension |
| | | Gazioğlu | Agricultural production | Animal Husbandry | Beekeeping |
| | | Köseilyas | Agricultural production | Animal Husbandry | Retirement pension |
| | | Husunlu | Agricultural production | Retirement pension | Animal Husbandry |
| | | Çiftlikönü (Gündoğdu) | Construction and industry | Agricultural production | Retirement pension |
| | | İstiklal (Eskicami) | Wage labour | Retirement pension | - |
| | | Karahisarlı | Agricultural production | Animal Husbandry | Retirement pension |
| | | Kayı | Agricultural production | Animal Husbandry | Retirement pension |
| | | Yağcı | Agricultural production | Animal Husbandry | Retirement pension |
| | | Nusratlı | Agricultural production | Retirement pension | Animal Husbandry |
| | | Zafer | Trade | Retirement pension | Agricultural production |
| | | Osmanlı | Agricultural production | Animal Husbandry | Retirement pension |
| | | Seymenli | Agricultural production | Animal Husbandry | Retirement pension |
| | | Güveçli | Agricultural production | Animal Husbandry | Retirement pension |
| | | Nusratfakı | Agricultural production | Animal Husbandry | Retirement pension |
| | | İnecik | Agricultural production | Animal Husbandry | Retirement pension |
| | | Mahramlı | Agricultural production | Animal Husbandry | Retirement pension |
| | | Kınıklar | Animal Husbandry | Agricultural production | Retirement pension |
| **Tekirdağ** | **Malkara** | Dereköy | Animal Husbandry | Agricultural production | Retirement pension |

| Province | District | Neighbourhood | Primary Income Source | Secondary Income Source | Tertiary Income Source |
|---|---|---|---|---|---|
| | | Yenice | Agricultural production | Animal Husbandry | Retirement pension |
| | | Hereke | Agricultural production | Animal Husbandry | Retirement pension |
| | | Ahievren | Agricultural production | Animal Husbandry | Trade |
| **Tekirdağ** | **Şarköy** | Tepeköy | Retirement pension | Agricultural production (horticulture) | Animal Husbandry |
| **Tekirdağ** | **Muratlı** | Yukarısırt | Yukarısırıt | Agricultural production | Animal Husbandry |

## Occupational Distribution

The occupational distribution of the population of the neighbourhoods located in the Project AoI are given in Table 115. While people living in the neighbourhoods are mainly farmers, salaried employees and retired, there are business owners, casual employees and also unemployed population.

**Table 115: The Distribution of neighbourhood Population by Occupation**

| Province | District | Neighbourhood | Farmer (%) | Salaried employee (%) | Retired (%) | Business owner (%) | Casual employee (%) | Unemployed (%) |
|---|---|---|---|---|---|---|---|---|
| **İstanbul** | **Silivri** | Değirmenköy Fevzipaşa | 65 | 25 | 10 | 0 | 0 | 0 |
| | | Çeltik | 45 | 40 | 15 | 0 | 0 | 0 |
| | | Yolçatı | 40 | 4.5 | 50 | 4.5 | 0.5 | 0.5 |
| | | Çanta Sancaktepe | 5 | 70 | 17 | 1 | 2 | 5 |
| | | Çanta Balaban | 20 | 40 | 20 | 0 | 10 | 10 |
| | | Gümüşyaka | 35 | 15 | 20 | 20 | 5 | 5 |
| | | Alipaşa | 50 | 15 | 47 | 0.5 | 0 | 0 |
| | | Semizkumlar | 5 | 75 | 20 | 0 | 0 | 0 |
| | | Danamandıra | 28 | 60 | 10 | 1 | 1 | 0 |
| **Tekirdağ** | **Çorlu** | Seymen | 40 | 48 | 10 | 2 | 0 | 0 |
| | | Şahbaz | 25 | 30 | 44 | 1 | 0 | 0 |
| | | Türkgücü | 30 | 30 | 30 | 5 | 0 | 5 |
| | | Yenice | 10 | 15 | 60 | 5 | 8 | 2 |
| | | Maksutlu | 95 | 5 | 0 | 0 | 0 | 0 |
| **Tekirdağ** | | Türkmenli | 8 | 12 | 50 | 0 | 10 | 20 |

| Province | District | Neighbourhood | Farmer (%) | Salaried employee (%) | Retired (%) | Business owner (%) | Casual employee (%) | Unemployed (%) |
|---|---|---|---|---|---|---|---|---|
| | **Marmara ereğlisi** | Yakuplu | 80 | 5 | 13 | 1 | 1 | 0 |
| | | Çeşmeli | 50 | 5 | 40 | 5 | 0 | 0 |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | 0 | 30 | 30 | 10 | 15 | 15 |
| | | Karaevli | 50 | 20 | 28 | 2 | 0 | 0 |
| | | Gazioğlu | 70 | 6 | 18 | 6 | 1 | 0 |
| | | Köseilyas | 40 | 5 | 19 | 6 | 15 | 15 |
| | | Husunlu | 42.5 | 10 | 42.5 | 0 | 5 | 0 |
| | | Çiftlikönü (Gündoğdu) | 15 | 40 | 30 | 10 | 0 | 5 |
| | | İstiklal (Eskicami) | 0 | 50 | 50 | 0 | 0 | 0 |
| | | Karahisarlı | 60 | 5 | 30 | 3 | 0 | 2 |
| | | Kayı | 50 | 15 | 30 | 2.5 | 0 | 2.5 |
| | | Yağcı | 70 | 4 | 20 | 5 | 0 | 1 |
| | | Zafer | 15 | 60 | 20 | 0 | 0 | 5 |
| | | Osmanlı | 90 | 1 | 6 | 1 | 1 | 1 |
| | | Seymenli | 25 | 30 | 30 | 5 | 0 | 10 |
| | | Güveçli | 70 | 0 | 30 | 0 | 0 | 0 |
| | | Nusratfakı | 40 | 5 | 35 | 0 | 5 | 5 |
| | | İnecik | 60 | 5 | 19 | 10 | 5 | 1 |
| | | Nusratlı | 70 | 5 | 50 | 0 | 0 | 5 |
| | | Mahramlı | 0 | 1.5 | 50 | 4 | 0 | 0 |
| | | Kınıklar | 70 | 5 | 28 | 1 | 2 | 0 |
| **Tekirdağ** | **Malkara** | Dereköy | 65 | 0 | 35 | 0 | 0 | 0 |
| | | Yenice | 60 | 0 | 39 | 1 | 0 | 0 |
| | | Hereke | 0 | 4 | 0 | 0.5 | 0 | 0 |
| | | Ahievren | 65 | 5 | 18 | 10 | 1 | 1 |
| **Tekirdağ** | **Şarköy** | Tepeköy | 10 | 0 | 90 | 0 | 0 | 0 |
| **Tekirdağ** | **Muratlı** | Yukarısırt | 70 | 5 | 20 | 5 | 0 | 0 |

Whether there are changes in job opportunities in the neighbourhoods in the last five years were asked during social field study, and answers are presented in Table 116. While job opportunities stayed the same in some of the neighbourhoods, there are decrease and increase in other neighbourhoods.

**Table 116: Changes in Job Opportunities in the Neighbourhoods in the Last Five Years**

| Province | District | Neighbourhood | Change | Reasons of change |
|---|---|---|---|---|
| **İstanbul** | **Silivri** | Değirmenköy Fevzipaşa | ↑ | Development of industrial sector |
| | | Çeltik | Same | N/A |
| | | Yolçatı | ↓ | Increased inputs |
| | | Çanta Sancaktepe | ↑ | Development of industrial sector |
| | | Çanta Balaban | ↑ | Development of industrial sector |
| | | Gümüşyaka | ↑ | Development of industrial sector |
| | | Danamandıra | ↓ | Increased inputs |
| | | Alipaşa | Same | N/A |
| | | Semizkumlar | Same | N/A |
| **Tekirdağ** | **Çorlu** | Seymen | Same | N/A |
| | | Şahbaz | ↓ | Increased inputs |
| | | Türkgücü | ↑ | Development of industrial sector |
| | | Yenice | ↓ | Economic problems in the country |
| | | Maksutlu | Same | N/A |
| **Tekirdağ** | **Marmaraereğlisi** | Türkmenli | Same | N/A |
| | | Yakuplu | Same | N/A |
| | | Çeşmeli | Same | N/A |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | Same | N/A |
| | | Karaevli | ↓ | Economic problems in the country |
| | | Gazioğlu | Same | N/A |
| | | Köseilyas | ↓ | Increased inputs |
| | | Husunlu | ↓ | Increased inputs |
| | | Çiftlikönü (Gündoğdu) | ↑ | Development of industrial sector |
| | | İstiklal (Eskicami) | Same | N/A |
| | | Karahisarlı | Same | N/A |
| | | Kayı | ↓ | Increased inputs |
| | | Yağcı | ↓ | Increased inputs |
| | | Nusratlı | ↓ | Increased inputs |
| | | Osmanlı | ↓ | Increased inputs |
| | | Seymenli | Same | N/A |
| | | Güveçli | Same | N/A |

| Province | District | Neighbourhood | Change | Reasons of change |
|---|---|---|---|---|
| | | Nusratfakı | Same | N/A |
| | | İnecik | ↓ | Increased inputs |
| | | Zafer | Same | N/A |
| | | Mahramlı | Same | N/A |
| | | Kınıklar | Same | N/A |
| **Tekirdağ** | **Malkara** | Dereköy | Same | N/A |
| | | Yenice | ↓ | Increased inputs |
| | | Hereke | ↓ | Increased unemployment |
| | | Ahievren | ↑ | New workplaces and factories opened |
| **Tekirdağ** | **Şarköy** | Tepeköy | ↓ | Increased inputs and decreased farming land |
| **Tekirdağ** | **Muratlı** | Yukarısırt | Same | N/A |

### Animal Husbandry

Animal husbandry is one of the primary economic sectors of neighbourhoods. While poultry is very common in all of these neighbourhood, cattle breeding is predominant in some neighbourhood, and sheep and goat breeding is predominant in some others.

There is no animal husbandry in Bahçelievler, Değirmenaltı and Namık Kemal in the Süleymanpaşa District, which is due to the fact that Süleymanpaşa is the central district of Tekirdağ with having urbanised characteristics. Cattle breeding is predominant in Seymen and Şahbaz in the Çorlu District, Türkmenli in the Marmaraereğlisi District, Osmanlı and Yağcı in the Süleymanpaşa District, and Ahievren in the Malkara District. Sheep and goat breeding is carried out intensively in Fevzipaşa and Çanta Balaban in the Silivri District; Seymen, Şahbaz, and Türkgücü in the Çorlu District; Türkmenli in the Marmaraereğlisi District; Osmanlı and Yağcı in the Süleymanpaşa District; and Ahievren in the Malkara District. Beekeeping is a commercial income source only in Yolçatı, Seymen, Maksutlu, Gazioğlu, Hacıköy, and Akçahalil, and in other settlements it is carried out for hobby purposes or as household consumption. The numbers of animals in the neighbourhoods are provided in Table 117.

**Table 117: The Numbers of Animals for Animal Husbandry in the Neighbourhoods**

| Province | District | Neighbourhood | Number of cattle | Number of sheep and goats | Number of poultry | Number of beehives |
|---|---|---|---|---|---|---|
| **İstanbul** | **Silivri** | Değirmenköy Fevzipaşa | Unknown | Unknown | Unknown | Unknown |
| | | Alipaşa | 40 | 150 | 0 | 50 |
| | | Çeltik | 50 | 300 | 10,000 | 150 |
| | | Yolçatı | 250 | 1,600 | 25,000 | 200 |

| Province | District | Neighbourhood | Number of cattle | Number of sheep and goats | Number of poultry | Number of beehives |
|---|---|---|---|---|---|---|
| | | Çanta Sancaktepe | 300 | 1,500 | 500 | 25 |
| | | Çanta Balaban | 300 | 3,000 | 50 | 500 |
| | | Gümüşyaka | 500 | 1,500 | 500 | 750 |
| | | Danamandıra | 800 | 600 | 0 | 150 |
| | | Semizkumlar | 0 | 0 | 0 | 0 |
| **Tekirdağ** | **Çorlu** | Seymen | 2,000 | 3,000 | 0 | 350 |
| | | Şahbaz | 1,000 | 4,000 | 0 | 100 |
| | | Türkgücü | 600 | 4,000 | 1,000 | 1,000 |
| | | Yenice | 115 | 250 | 1,500 | 50 |
| | | Maksutlu | 150 | 50 | 500 | 350 |
| **Tekirdağ** | **Marmaraereğlisi** | Türkmenli | 1,000 | 3,000 | 1,500 | 300 |
| | | Yakuplu | 330 | 200 | 300 | 50 |
| | | Çeşmeli | 100 | 1,000 | 500 | 50 |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | 0 | 0 | 0 | 0 |
| | | Karaevli | 80 | 2,500 | 0 | 50 |
| | | Gazioğlu | 150 | 3,000 | 2,000 | 1,500 |
| | | Köseilyas | 300 | 1,200 | 200 | 300 |
| | | Husunlu | 50 | 200 | 400 | 20 |
| | | Çiftlikönü (Gündoğdu) | 0 | 0 | 0 | 0 |
| | | İstiklal (Eskicami) | 0 | 0 | 0 | 0 |
| | | Karahisarlı | 150 | 200 | 500 | 10 |
| | | Kayı | 750 | 1,900 | 300 | 150 |
| | | Yağcı | 1,000 | 2,500 | 500 | 600 |
| | | Zafer | 0 | 0 | 0 | 0 |
| | | Osmanlı | 1,200 | 700 | 800 | 150 |
| | | Seymenli | 500 | 500 | 0 | 100 |
| | | Güveçli | 80 | 100 | 200 | 50 |
| | | Nusratfakı | 70 | 100 | 25 | 120 |

| Province | District | Neighbourhood | Number of cattle | Number of sheep and goats | Number of poultry | Number of beehives |
|---|---|---|---|---|---|---|
| | | İnecik | 200 | 600 | 200 | 400 |
| | | Nusratlı | 20 | 500 | 50 | 200 |
| | | Mahramlı | 80 | 400 | 250 | 0 |
| | | Kınıklar | 200 | 150 | 800 | 70 |
| **Tekirdağ** | **Malkara** | Dereköy | 150 | 350 | 5 | 80 |
| | | Yenice | 100 | 100 | 250 | 100 |
| | | Hereke | 750 | 900 | 0 | 300 |
| | | Ahievren | 1,200 | 1,200 | 1,000 | 250 |
| **Tekirdağ** | **Şarköy** | Tepeköy | 4 | 600 | 100 | 200 |
| **Tekirdağ** | **Muratlı** | Yukarısırt | 20 | 600 | 200 | 0 |

### Agricultural Production

One of the primary economic activities is agricultural production in the neighbourhoods. Especially in Tekirdağ, wheat, barley and sunflower production is one of the main income sources. In addition, Türkiye's wheat and sunflower demand is mostly met by Tekirdağ. The annual number of agricultural products produced in the neighbourhoods (kg) are presented in Table 118

.

**Table 118: The Number of Agricultural Products Produced in the Neighbourhoods Annually (kg)**

| Province | District | Neighbourhood | Wheat | Barley | Chickpea | Sunflower | Corn | Feed crops | Canola |
|---|---|---|---|---|---|---|---|---|---|
| **İstanbul** | **Silivri** | Değirmenköy Fevzipaşa | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Alipaşa | 35,000,000 | 300,000 | 0 | 800 | 0 | 0 | 0 |
| | | Çeltik | 800,000 | 800,000 | 150,000 | 250,000 | 0 | 0 | 400,000 |
| | | Yolçatı | 650,000 | 550,000 | 150,000 | 250,000 | 0 | 0 | 0 |
| | | Çanta Sancaktepe | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Çanta Balaban | 11,200.000 | 5,600.000 | 0 | 5,600.000 | 0 | 0 | 0 |
| | | Gümüşyaka | 4,000.000 | 2,000.000 | 0 | 3,000.000 | 0 | 0 | 2,000.000 |
| | | Danamandıra | 0 | 500,000 | 0 | 0 | 500,000 | 0 | 0 |
| | | Semizkumlar | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Tekirdağ** | **Çorlu** | Seymen | 140,000 | 70,000 | 0 | 43,000 | 0 | 0 | 0 |
| | | Şahbaz | 1,600.000 | 400,000 | 0 | 2,500.000 | 0 | 0 | 500,000 |
| | | Türkgücü | 25,000.000 | 1,000.000 | 0 | 14,000.000 | 0 | 1,000.000 | 0 |
| | | Yenice | 15,000.000 | 10,000.000 | 0 | 5,000 | 0 | 0 | 0 |
| | | Maksutlu | 50,000.000 | 15,000.000 | 0 | 20,000.000 | 10,000,000 | 5,000.000 | 0 |
| **Tekirdağ** | **Marmaraereğlisi** | Türkmenli | 1,200.000 | 900,000 | 0 | 1,050.000 | 0 | 0 | 0 |
| | | Yakuplu | 4,000.000 | 1,000.000 | 0 | 2,000.000 | 0 | 0 | 0 |
| | | Çeşmeli | 2,000.000 | 500,000 | 0 | 1,000.000 | 0 | 0 | 0 |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Karaevli | 7,500.000 | 3,000.000 | 0 | 3,000.000 | 0 | 0 | 0 |
| | | Gazioğlu | 2,000.000 | 500,000 | 0 | 6,000.000 | 0 | 0 | 0 |
| | | Köseilyas | 3,000.000 | 600,000 | 0 | 6,000.000 | 0 | 0 | 0 |

| Province | District | Neighbourhood | Wheat | Barley | Chickpea | Sunflower | Corn | Feed crops | Canola |
|---|---|---|---|---|---|---|---|---|---|
| | | Husunlu | 3,150.000 | 1,000.000 | 0 | 900,000 | 0 | 0 | 0 |
| | | Çiftlikönü (Gündoğdu) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | İstiklal (Eskicami) | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Karahisarlı | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Kayı | 3,200.000 | 300,000 | 0 | 187,500 | 0 | 0 | 0 |
| | | Yağcı | 6,000.000 | 500,000 | 0 | 2,200.000 | 0 | 0 | 600,000 |
| | | Zafer | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | | Osmanlı | 10,000.000 | 1,000.000 | 0 | 4,000.000 | 0 | 0 | 0 |
| | | Seymenli | 40,000.000 | 100,000 | 0 | 8,000.000 | 0 | 0 | 0 |
| | | Güveçli | 1,000.000 | 50,000 | 0 | 200,000 | 0 | 0 | 0 |
| | | Nusratfakı | 2,400.000 | 1,200.000 | 0 | 0 | 0 | 0 | 150,000 |
| | | İnecik | 500,000 | 100,000 | 0 | 250,000 | 0 | 0 | 0 |
| | | Nusratlı | 5,850,000 | 0 | 0 | 1,800,000 | 0 | 0 | |
| | | Mahramlı | 2,000.000 | 10,000 | 0 | 7,500.000 | 0 | 0 | 200,000 |
| | | Kınıklar | 1,500.000 | 100,000 | 1000 | 500,000 | 25,000 | 0 | 0 |
| **Tekirdağ** | **Malkara** | Dereköy | 1,200.000 | 0 | 0 | 400,000 | 0 | 0 | 0 |
| | | Yenice | 1,200.000 | 0 | 0 | 500,000 | 0 | 0 | 0 |
| | | Hereke | 5,000.000 | 500.000 | 0 | 3,000,000 | 0 | 0 | 50,000 |
| | | Ahievren | 20,000.000 | 2,000.000 | 3,000 | 8,000.000 | 0 | 1,500.000 | 0 |
| **Tekirdağ** | **Şarköy** | Tepeköy | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Tekirdağ** | **Muratlı** | Yukarısırt | 2,000,000 | 0 | 0 | 0 | 0 | 0 | 50,000 |

### Ecosystem Service Usage

Ecosystem services is used for income sources, household consumption, and hobby purposes. Details of the ecosystem usage for each settlement located in the AoI is provided in Table 119

.

**Table 119: Ecosystem Service Usage in the Neighbourhoods**

| District | Neighbourhood | River (Existence, Usage, Fish Type, İrrigation Usage, Household numbers using for irrigation) | | | | | Forest (Existence, Usage Purpose, Wood Picking, Income from Wood Picking, Wood Picking for Household Consumption) | | | | | Plant picking (thyme, mushroom, etc.) (Existence, Using for income sources, Using for household consumption) | | | Hunting (Existence, Hunting for household consumption, Animals) | | | Picnic area (Existence) | Historical area (Existence, Detail) | | Spring water (Existence, Number of households using) | | Well water (Existence, Usage Purpose, Number of households using) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Silivri** | Değirmenköy Fevzipaşa | Kınık Creek | No | - | No | 0 | Yes | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | Yes | - | Yes | - | 120 |
| | Alipaşa | No | - | - | - | - | No | - | - | - | - | No | - | - | No | - | - | No | No | - | No | - | No | - | - |
| | Semizkumlar | No | - | - | No | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Çeltik | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Yolçatı | Yes | No | - | Yes | 40 | Yes | - | No | 0 | 0 | No | - | - | Yes | 4 | Duck | No | Yes | Plane Tree | Yes | 0 | No | - | 0 |
| | Çanta Sancaktepe | No | - | - | - | 0 | Yes | - | No | 2 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Çanta Balaban | Yes | Yes | - | No | 0 | Yes | - | No | 2 | 2 | Yes | - | - | Yes | 15 | Rabbit | No | Yes | Ahmet Faki Sanctorium | No | - | No | - | 0 |
| | Gümüşyaka | Yes | - | - | Yes | 10 | No | - | No | 0 | 0 | No | - | - | Yes | 10 | Quail | Yes | No | | No | - | Yes | Irrigation | 10 |
| | Danamandıra | Yes | No | - | Yes | 0 | Yes | Wood picking | Yes | 400 | 400 | Yes | 200 | - | No | - | - | No | No | | Yes | 400 | No | - | 0 |
| **Çorlu** | Seymen | Yes | No | - | Yes | 15 | Yes | - | No | 0 | 0 | No | - | - | No | - | - | Yes | No | | Yes | 100 | No | - | 0 |
| | Şahbaz | Yes | No | - | No | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Türkgücü | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | Yes | No | | Yes | 500 | No | - | 0 |
| | Yenice | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | Yes | 10 | Quail | Yes | Yes | Murtaza Sanctorium | No | - | Yes | Drinking and potable | 0 |
| | Maksutlu | No | - | - | - | 0 | Yes | Wood picking | Yes | 0 | 17 | No | - | - | No | - | - | No | No | | Yes | 17 | Yes | Drinking and potable | 17 |
| **Marmaraereğlisi** | Türkmenli | Yes | No | - | Yes | 5 | No | - | No | 0 | 0 | No | - | - | No | - | - | Yes | No | | No | - | Yes | Drinking | 250 |
| | Yakuplu | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | Yes | No | | No | - | Yes | Potable | 90 |
| | Çeşmeli | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | Yes | No | | Yes | - | Yes | - | 0 |
| **Süleymanpaşa** | Aydoğdu | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Karaevli | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | Yes | 60 | No | - | 0 |
| | Gazioğlu | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | Yes | 200 | Yes | Potable | 70 |
| | Köseilyas | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Husunlu | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | Yes | Drinking | 120 |
| | Çiftlikönü (Gündoğdu) | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | İstiklal (Eskicami) | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Karahisarlı | No | - | - | - | 0 | Yes | Plant picking | No | 0 | 0 | Yes | 0 | 10 | No | - | - | No | No | | No | - | No | - | 0 |
| | Kayı | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | Yes | Çoban Baba Sanctorium | Yes | 110 | Yes | Irrigation | 110 |

| District | Neighbourhood | River (Existence, Usage, Fish Type, İrrigation Usage, Household numbers using for irrigation) | | | | | Forest (Existence, Usage Purpose, Wood Picking, Income from Wood Picking, Wood Picking for Household Consumption) | | | | | Plant picking (thyme, mushroom, etc.) (Existence, Using for income sources, Using for household consumption) | | | Hunting (Existence, Hunting for household consumption, Animals) | | | Picnic area (Existence) | Historical area (Existence, Detail) | | Spring water (Existence, Number of households using) | | Well water (Existence, Usage Purpose, Number of households using) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Yağcı | Yes | No | - | Yes | 10 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | Yes | Yönbaba Sanctorium | No | - | Yes | Potable | 10 |
| | Zafer | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | Yes | Martyrdom | No | - | No | - | 0 |
| | Osmanlı | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | Yes | No | | Yes | 120 | No | - | 0 |
| | Seymenli | No | - | - | - | 0 | Yes | Wood picking | Yes | 0 | 30 | No | - | - | Yes | 5 | Pig | Yes | No | | No | - | No | - | 0 |
| | Güveçli | No | - | - | - | 0 | Yes | Wood picking | Yes | 0 | 20 | No | - | - | No | - | - | No | No | | Yes | 20 | Yes | Irrigation | 3 |
| | Nusratfakı | No | - | - | - | 0 | Yes | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | Yes | 20 | Yes | Irrigation | 20 |
| | İnecik | Yes | No | - | Yes | 10 | Yes | Wood picking | Yes | 0 | 200 | Yes | 0 | 2 | Yes | 8 | Rabbit | No | Yes | Historical mosque | Yes | 200 | Yes | Potable | 15 |
| | Nusratlı | Yes | Yes | 0 | 5 | 0 | No | - | No | 0 | 0 | No | - | - | Yes | - | Rabbit | No | No | | Yes | 60 | Yes | Irrigation | 20 |
| | Mahramlı | Yes | No | - | No | 0 | Yes | Not in use | No | 0 | 0 | No | 0 | 0 | No | 0 | - | No | No | | Yes | 30 | No | - | 0 |
| | Kınıklar | Yes | No | - | Yes | 10 | Yes | Wood and plant picking | Yes | 0 | 10 | Yes | 3 | - | No | - | - | Yes | Yes | Very old pine tree | Yes | 5 | Yes | - | 0 |
| **Malkara** | Dereköy | No | - | - | - | 0 | Yes | Wood picking | Yes | 0 | 60 | No | - | - | No | - | - | No | No | | Yes | 8 | No | - | 0 |
| | Yenice | Yes | No | - | No | 0 | Yes | Hunting | No | 0 | 0 | No | - | - | Yes | 0 | Pig | No | No | | Yes | 26 | No | - | 0 |
| | Hereke | No | No | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | No | - | 0 |
| | Ahievren | No | - | - | No | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | No | - | Yes | Irrigation | 10 |
| **Şarköy** | Tepeköy | No | - | - | - | 0 | Yes | - | No | 0 | 0 | No | - | - | No | - | - | No | No | | Yes | 140 | Yes | Drinking and potable | 140 |
| **Muratlı** | Yukarısırt | No | - | - | - | 0 | No | - | No | 0 | 0 | No | - | - | No | - | - | Yes | No | | Yes | 0 | No | - | 0 |

### 6.3.1.9 Vulnerable Groups

#### 6.3.1.9.1 Introduction

This section of the identifies vulnerable groups within the AoI, including province and neighbourhood level. The Mukhtars were asked to identify vulnerable groups in their neighbourhoods. Vulnerable groups were defined based on a predefined understanding of vulnerability in the social baseline. The following classification on vulnerable groups is used for the social baseline and impact studies especially on the settlement level:

- Illiterate individuals
- People who cannot speak Turkish
- Mobile beekeepers
- Refugees
- Woman headed households
- Households living with social aid
- Children at education age but not involved in education
- Bedridden patients
- Elderly living alone and over 70 years old
- People with physical disabilities
- People with mental disabilities

At the provincial level, detailed data on all vulnerable groups is often not accessible due to limitations in data collection and reporting systems.

#### 6.3.1.9.2 Province and District Level

Social assistance and solidarity foundations linked with the Provincial Governorship provide support to vulnerable groups at the provincial level. Every district in İstanbul has a Social Assistance and Solidarity Foundation established to meet the needs of vulnerable groups and people in need and affiliated with The Ministry of Family and Social Services. The list of social assistance and solidarity foundations in the Tekirdağ Province is presented below.

- Çerkezköy Social Assistance and Solidarity Foundation
- Çorlu Social Assistance and Solidarity Foundation
- Ergene Social Assistance and Solidarity Foundation
- Hayrabolu Social Assistance and Solidarity Foundation
- Kapaklı Social Assistance and Solidarity Foundation
- Malkara Social Assistance and Solidarity Foundation
- Marmaraereğlisi Social Assistance and Solidarity Foundation
- Süleymanpaşa Social Assistance and Solidarity Foundation

- Muratlı Social Assistance and Solidarity Foundation
- Saray Social Assistance and Solidarity Foundation
- Şarköy Social Assistance and Solidarity Foundation

In addition to social assistance and solidarity foundations, there are also social services centres in every district responsible for the supply and maintenance of social services.

### *Elderly living alone and over 70 years old*

While age does not create vulnerability by itself, certain problems experienced commonly by a particular group of people due to their age create social vulnerability. In this case, older adults may be considered a vulnerable group regarding physical, social, economic, and environmental factors. Considering the relatively lower education levels of the older population and their difficulties in adapting to the changes arising from the Project, this group is considered as a vulnerable group.

In cities, assisted living is one of the services provided by public and private institutions. Assisted living is a centre that provides a social life where older adults, who have difficulty sustaining their lives above a certain age, cared for 24 hours a day and life.

In İstanbul, there are 9 public institutions located in the Bahçelievler, Beylikdüzü, Üsküdar, Beşiktaş, Çekmeköy, Sarıyer, Maltepe, Sultangazi, Zeytinburnu districts that provide assisted living for older adults affiliated with The Ministry of Family and Social Services İstanbul Provincial Directorate are as follows:

- Bahçelievler Care and Rehabilitation Center for Older Adults
- Beylikdüzü Care and Rehabilitation Center for Older Adults
- Prof. Dr. Fahrettin Kerim-Nilüfer Gökay Care and Rehabilitation Center for Older Adults (Üsküdar)
- Etiler Care and Rehabilitation Center for Older Adults (Beşiktaş)
- Göztepe Semiha Şakir Care and Rehabilitation Center for Older Adults (Çekmeköy)
- İzzet Baysal Care and Rehabilitation Center for Older Adults (Sarıyer)
- Maltepe Care and Rehabilitation Center for Older Adults
- Sultangazi Assisted Living Facility
- Zeytinburnu Semiha Şakir Assisted Living Facility

In Tekirdağ, there are 3 public institutions located in the Çorlu, Malkara and Süleymanpaşa districts that provide assisted living for older adults affiliated with The Ministry of Family and Social Services Tekirdağ Provincial Directorate are as follows:

- Malkara Care and Rehabilitation Centre for Older Adults
- Tekirdağ Zübeyde Hanım Assisted Living Facility and Children’s Home (Merkez)
- Çorlu Assisted Living Facility

Apart from these public institutions, there are 10 private institutions that provide assisted living for older adults in İstanbul.

### *People with disabilities*

Metropolitan and district municipalities provide social services for people with disabilities. All municipalities have a unit or directorate responsible for social services provided for vulnerable groups. The type and the scope of these social services vary according to the different numbers and needs of people with disabilities living in the provinces and districts.

While the population of Istanbul is approximately 15 million, the population of people with disabilities is 370,430. The ratio of the population of people with disabilities to the provincial population is 2.47%, which is the lowest ratio in Türkiye (The Ministry of Family and Social Services, 2023).

The social services or projects provided by Silivri Municipality are:

- Silivri Municipality People with Disabilities and Older Adults Coordination Centre (EYKOM)

In Istanbul, there are 10 institutions affiliated with The Ministry of Family and Social Services İstanbul Provincial Directorate that provide special care for people with disabilities. These institutions are as follows:

- Çatalca Day Care Rehabilitation and Family Counselling Centre
- Bayrampaşa Day Care Rehabilitation and Family Counselling Centre
- Beylikdüzü Barrier-Free Living Care Rehabilitation and Family Counselling Centre
- Şeyh Zayed Bahçelievler Care Rehabilitation and Family Counselling Centre
- Bakırköy 80. Yıl Care Rehabilitation and Family Counselling Centre
- İstanbul Visually Handicapped Care Rehabilitation and Family Counselling Centre
- Esenyurt Care and Rehabilitation Centre
- Metin Sabancı Spastic Children Rehabilitation Centre
- Pendik Barrier-Free Living Care Rehabilitation and Family Counselling Centre
- İstanbul Autism Care Rehabilitation and Family Counselling Centre

In the case of Tekirdağ, there are no official data available on the population of people with disabilities living in the province. In Tekirdağ, there is currently a project in the construction phase of Ergene Soup House People with Disabilities and Older Adults Care Centre by Tekirdağ Metropolitan Municipality.

The social services or projects provided by Çorlu Municipality are:

- Barrier-free Taxi
- Barrier-free Cafe

The social services or projects provided by Malkara Municipality are:

- Malkara Persons with Disabilities Centre

The social services or projects provided by Süleymanpaşa Municipality are:

- Barrier-free Taxi
- Battery Wheelchair, Wheelchair, Medical Equipment and Educational Support

***Unemployed people and people living in poverty***

According to the Labour Market Research İstanbul Province 2023 Result Report by Turkish Employment Agency, the number of registered unemployed people in İstanbul was 332,068. 50.03% of this number consisted of women (166,139), and the unemployment rate of young people aged 15-24 is 15.5 percent (51,498) (Turkish Employment Agency, 2023). It can be said that the number of registered unemployed people, especially women, has decreased compared to the 2022 number of 424,542, consisting of 49.5% women (Turkish Employment Agency, 2022).

According to the Labour Market Research Tekirdağ Province 2023 Result Report by Turkish Employment Agency, the number of registered unemployed people in Tekirdağ is 35,131. 52.7% of this number consisted of women (18,530), and the unemployment rate of young people aged 18-24 is 18.8 percent (6,617) (Turkish Employment Agency, 2023). It can be said that the number of registered unemployed people, especially women, has increased compared to the 2022 number of 39,449, consisting of 54.1% of women (Turkish Employment Agency, 2022). In this case, women and the younger population suffer from unemployment the most, which puts them in a vulnerable condition.

Especially the Physical Worker (General) occupational group, followed by the occupational groups of Sales Consultant and Cleaning Officer, are the three groups with the highest registered unemployment rates. Although high registered unemployment rates for these occupational groups are common throughout Türkiye, it is also observed in Tekirdağ and İstanbul.

These unemployment trends highlight the ongoing challenge regarding unemployment among women and young people, which the Project aims to address by creating temporary employment opportunities during the construction phase. By focusing on the high unemployment rates within occupational groups like physical workers, sales consultants, and cleaning officers in İstanbul and Tekirdağ, the Project can provide much-needed employment, even if only for a limited time.

The persistent poverty rate, calculated using four-year panel data, includes individuals who were poor at 60% of the median household disposable income in the last year and in at least two of the previous three years. According to the survey results for 2023, the persistent poverty rate decreased by 1.7 points compared to the previous year and became 12.3%. (TURKSTAT, 2023). For 2023, the poverty threshold is increased from 14,197 to 23,349 TRY.

According to 2023 Income and Living Conditions Survey Regional Results, TR10 (İstanbul) and TR21 (Tekirdağ, Edirne, Kırklareli) regions have %12.6 and %11.5 poverty ratio, respectively (TURKSTAT, 2023).

#### 6.3.1.9.3 Neighbourhood Level

The number of individuals identified as vulnerable in the neighbourhoods through the household Survey is presented in Table 120.

**Table 120: Vulnerable Groups in the Neighbourhoods**

| District | Neighbourhoods | Illiterate | Cannot speak Turkish | Mobile beekeeper | Refugee | Woman household | Living with social aid | At education age but not involved in education | Bedridden Patients | Living alone over 70 years old | People with physical disabilities | People with mental disabilities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Silivri** | Değirmenköy Fevzipaşa | 5 | 20 | 15 | 50 | 150 | 0 | 0 | 100 | 11 | 6 | 1 |
| | Alipaşa | 5 | 0 | 0 | 0 | 0 | 0 | 5 | 93 | 0 | 0 | 0 |
| | Çeltik | 10 | 1 | 7 | 10 | 2 | 1 | 0 | 1 | 0 | 1 | 2 |
| | Yolçatı | 2 | 0 | 7 | 7 | 10 | 6 | 5 | 4 | 4 | 1 | 0 |
| | Çanta Sancaktepe | 10 | 0 | 0 | 150 | 250 | 50 | 0 | 150 | 0 | 0 | 0 |
| | Çanta Balaban | 10 | 10 | 0 | 30 | 200 | 18 | 5 | 10 | 50 | 20 | 10 |
| | Gümüşyaka | 0 | 0 | 10 | 0 | 0 | 500 | 0 | 2,000 | 10 | 10 | 10 |
| | Semizkumlar | 20 | 150 | 0 | 0 | 0 | 150 | 0 | 150 | 0 | 0 | 0 |
| | Danamandıra | 0 | 0 | 6 | 40 | 10 | 60 | 0 | 0 | 6 | 0 | 5 |
| **Çorlu** | Seymen | 0 | 0 | 15 | 12 | 30 | 15 | 0 | 200 | 5 | 7 | 4 |
| | Şahbaz | 0 | 0 | 2 | 8 | 15 | 0 | 0 | 0 | 1 | 1 | 2 |
| | Türkgücü | 0 | 0 | 10 | 0 | 20 | 15 | 0 | 10 | 20 | 10 | 2 |
| | Yenice | 0 | 0 | 20 | 20 | 50 | 20 | 0 | 45 | 25 | 15 | 12 |
| | Maksutlu | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 |
| **Marmaraereğlisi** | Türkmenli | 0 | 0 | 10 | 1 | 0 | 2 | 0 | 0 | 15 | 0 | 0 |
| | Yakuplu | 0 | 2 | 6 | 5 | 20 | 0 | 0 | 0 | 1 | 1 | 2 |
| | Çeşmeli | 0 | 0 | 5 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Süleymanpaşa** | Aydoğdu | Unknown | Unknown | Unknown | Unknown | Unknown | Unknown | Unknown [151] | Unknown | Unknown | Unknown | Unknown |
| | Karaevli | 0 | 0 | 0 | 0 | 3 | 3 | 0 | 0 | 2 | 0 | 0 |
| | Gazioğlu | 1 | 2 | 30 | 0 | 1 | 0 | 0 | 0 | 10 | 2 | 0 |
| | Köseilyas | 0 | 0 | 0 | 10 | 6 | 3 | 0 | 4 | 0 | 1 | 1 |
| | Husunlu | 0 | 0 | 0 | 0 | 25 | 15 | 0 | 10 | 25 | 1 | 0 |
| | Çiftlikönü (Gündoğdu) | 150 | 150 | 0 | 0 | 0 | 150 | 0 | 0 | 0 | 0 | 0 |
| | İstiklal (Eskicami) | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 23 | 0 | 5 | 0 |
| | Karahisarlı | 0 | 0 | 0 | 0 | 2 | 0 | 3 | 0 | 0 | 0 | 0 |
| | Kayı | 0 | 0 | 3 | 10 | 3 | 0 | 0 | 10 | 0 | 1 | 1 |
| | Yağcı | 0 | 0 | 0 | 10 | 8 | 0 | 0 | 80 | 5 | 4 | 1 |
| | Zafer | 200 | 0 | 0 | 0 | 0 | 20 | 0 | 0 | 0 | 0 | 0 |
| | Osmanlı | 0 | 0 | 0 | 27 | 4 | 2 | 0 | 1 | 2 | 2 | 0 |
| | Seymenli | 3 | 0 | 0 | 3 | 5 | 3 | 0 | 7 | 5 | 3 | 0 |

[151] During the interview, it was noted that Aydoğdu neighbourhood hosts Roman community with approximately 10,000 people whose literacy levels are lower, and many children do not attend school. The specific numbers are not available.

| District | Neighbourhoods | Illiterate | Cannot speak Turkish | Mobile beekeeper | Refugee | Woman household | Living with social aid | At education age but not involved in education | Bedridden Patients | Living alone over 70 years old | People with physical disabilities | People with mental disabilities |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Güvençli | 0 | 0 | 0 | 1 | 5 | 1 | 0 | 2 | 0 | 0 | 0 |
| | Nusratfakı | 5 | 0 | 0 | 0 | 6 | 2 | 0 | 10 | 2 | 0 | 0 |
| | İnecik | 0 | 0 | 4 | 0 | 3 | 4 | 0 | 0 | 0 | 3 | 3 |
| | Nusratlı | 5 | 0 | 15 | 1 | 0 | 0 | 7 | 5 | 0 | 0 | 0 |
| | Mahramlı | 0 | 0 | 3 | 5 | 8 | 1 | 0 | 0 | 0 | 0 | 1 |
| | Kınıklar | 2 | 0 | 2 | 2 | 2 | 2 | 0 | 0 | 0 | 0 | 0 |
| **Malkara** | Dereköy | 0 | 0 | 0 | 0 | 10 | 1 | 0 | 1 | 1 | 1 | 1 |
| | Yenice | 2 | 0 | 0 | 0 | 16 | 0 | 0 | 0 | 10 | 0 | 0 |
| | Hereke | 0 | 0 | 0 | 0 | 10 | 4 | 4 | 5 | 0 | 0 | 2 |
| | Ahievren | 0 | 15 | 5 | 15 | 10 | 5 | 0 | 0 | 6 | 2 | 0 |
| **Şarköy** | Tepeköy | 0 | 0 | 15 | 0 | 0 | 0 | 20 | 5 | 0 | 3 | 5 |
| **Muratlı** | Yukarısırt | 0 | 0 | 10 | 0 | 2 | 1 | 4 | 1 | 0 | 1 | 0 |

## 6.3.1.10 Education

### 6.3.1.10.1 Introduction

This section provides baseline information on the Project impact area, including education facilities and personnel, quality, literacy rates, access to higher education, and local challenges. Provincial and district-level data are drawn from secondary sources and Ministry of Education reports, while neighbourhood-level insights are based on primary data. This section provides baseline information on the Project impact area, including education facilities and personnel, quality of the education, literacy levels, access to higher education and local challenges. Baseline information is presented from the provincial to the Project impact level. The secondary sources and the Ministry of Education's Reports are used for the provincial and district level data and primary information is used for the neighbourhood level education baseline.

### 6.3.1.10.2 Province and District Level

#### *Education Facilities and Personnel*

According to the National Education Statistics Formal Education 2022/2023 data by the Ministry of National Education, there are 8,582 schools, 109,084 classrooms, 3,569,071 students and 178,071 teachers in the İstanbul Province, whereas there are 748 schools, 8,049 classrooms, 247,558 students and 12,890 teachers in the Tekirdağ Province. The selected education indicators of the province are presented in Table 121.

**Table 121: Formal Education Indicators of İstanbul and Tekirdağ**

| 2022-2023 Academic Year | Tekirdağ | İstanbul |
|---|---|---|
| Total Number of Students | 247,558 | 3,569,071 |
| Total Number of Teachers | 12,890 | 178,071 |
| Total Number of Schools | 748 | 8,582 |
| Total Number of Classrooms | 8,049 | 109,084 |
| Number of Schools with Boarding Houses | 11 | 102 |
| Number of Boarding Students | 993 | 8,822 |
| **Preschool** | | |
| Number of Students | 29,041 | 339,904 |
| Number of Teachers | 1,582 | 21,013 |
| Number of Schools | 400 | 4,900 |
| Number of Classrooms | 1,130 | 16,772 |
| Number of Students Falling to Schools | 72.6 | 69.4 |
| Number of Students Falling to Teachers | 18.4 | 16.2 |
| Number of Students Falling on The Classroom | 25.7 | 20.3 |
| **Primary school** | | |
| Number of Students | 68,920 | 973,978 |
| Number of Teachers | 3383 | 43,786 |
| Number of Schools | 180 | 1,645 |
| Number of Classrooms | 2,756 | 36,486 |
| Number of Students Per School | 382.9 | 592.1 |
| Number of Students Per Teacher | 20.4 | 22.2 |
| Number of Students Per Classroom | 25 | 26.7 |
| **Lower Secondary School** | | |
| Number of Students | 67,334 | 989,919 |
| Number of Teachers | 3,779 | 53,127 |
| Number of Schools | 182 | 1,764 |
| Number of Classrooms | 1,957 | 27,005 |

| 2022-2023 Academic Year | Tekirdağ | İstanbul |
|---|---|---|
| Number of Students Per School | 369,96 | 561,17 |
| Number of Students Per Teacher | 17.8 | 18.6 |
| Number of Students Per Classroom | 34.4 | 36.7 |
| **General Secondary Education (High School)** | | |
| Number of Students | 30,720 | 457,052 |
| Number of Teachers | 2,261 | 33,409 |
| Number of Schools | 75 | 1044 |
| Number of Classrooms | 1,220 | 18,166 |
| Number of Students Per School | 409.6 | 457.8 |
| Number of Students Per Teacher | 13.6 | 13.7 |
| Number of Students Per Classroom | 25.2 | 25.2 |
| **Vocational and Technical Secondary Education** | | |
| Number of Students | 22,696 | 278,131 |
| Number of Teachers | 1,791 | 20,311 |
| Number of Schools | 54 | 441 |
| Number of Classrooms | 906 | 9,307 |
| Number of Students Falling to Schools | 420.3 | 630.9 |
| Number of Students Falling to Teachers | 12.7 | 13.7 |
| Number of Students Falling on The Classroom | 25.1 | 29.9 |
| **Special Education** | | |
| Number of Students (Primary School) | 462 | 7,518 |
| Number of Students (Lower Secondary School) | 375 | 5,887 |
| Number of Allocated Classrooms (Primary School) | 235 | 3,949 |
| **Transporting and Transported Education[152] (Primary+Lower Secondary School)** | | |
| Number of Transporting Central Schools | 79 | 134 |
| Number of Transported Schools and Transported Settlement Places without a School | 36 | 205 |
| Number of Total Transported Primary School Students | 1,228 | 11,162 |
| Number of Total Transported Lower Secondary School Students | 1,607 | 11,576 |

*Source: The Ministry of National Education, 2023*

According to the data obtained from the website of the Ministry of National Education, as of 2023:

- In Silivri, there are 15 public preschools, 32 public primary schools, 20 public lower secondary schools, 10 high schools, 8 vocational training high schools and 1 public education centre.
- In Çorlu, there are 15 public preschools, 28 public primary schools, 17 public lower secondary schools, 10 high schools, 1 vocational training high school, and 1 public education centre.
- In Marmaraereğlisi, there are 2 public preschools, 4 public primary schools, 4 public lower secondary schools, 2 high schools, 1 vocational high school and 1 public education centre.
- In Malkara, there are 2 public preschools, 16 public primary schools, 13 public lower secondary schools, 4 high schools, 3 vocational training high schools, and 1 public education centre.

[152] Transported education is the education carried out in neighbourhoods with low populations and dispersed settlements by the daily transportation of students within the scope of compulsory education to central schools in larger settlements such as districts and provinces (The Ministry of National Education, 2022).

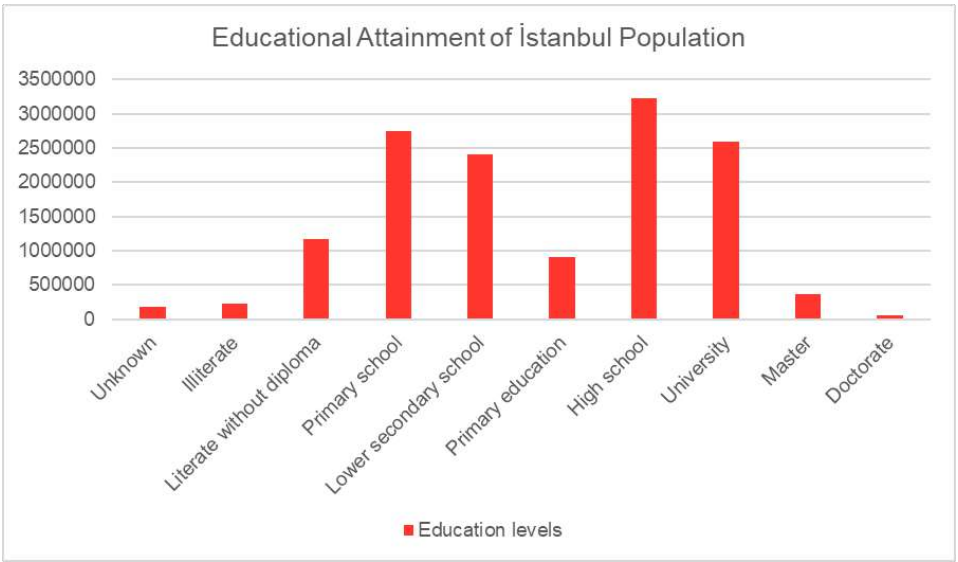
- In Şarköy, there are 2 public preschools, 6 public primary schools, 6 public lower secondary schools, 3 high schools, 2 vocational training high schools and 1 public education centre.
- In Süleymanpaşa, there are 8 public preschools, 22 public primary schools, 19 public lower secondary schools, 11 high schools, 8 vocational training high schools, and 1 public education centre.
- In Muratlı, there are 2 public preschools, 6 public primary schools, 7 public lower secondary schools, 2 high schools, 1 vocational training high school, and 1 public education centre.

## *Quality of Education*

No information and data are available on the quality of education at the district and province levels. There are international statistics available on the quality of education comparing different countries. Türkiye ranks 33 among 41 OECD countries according to the OECD Better Life Index.

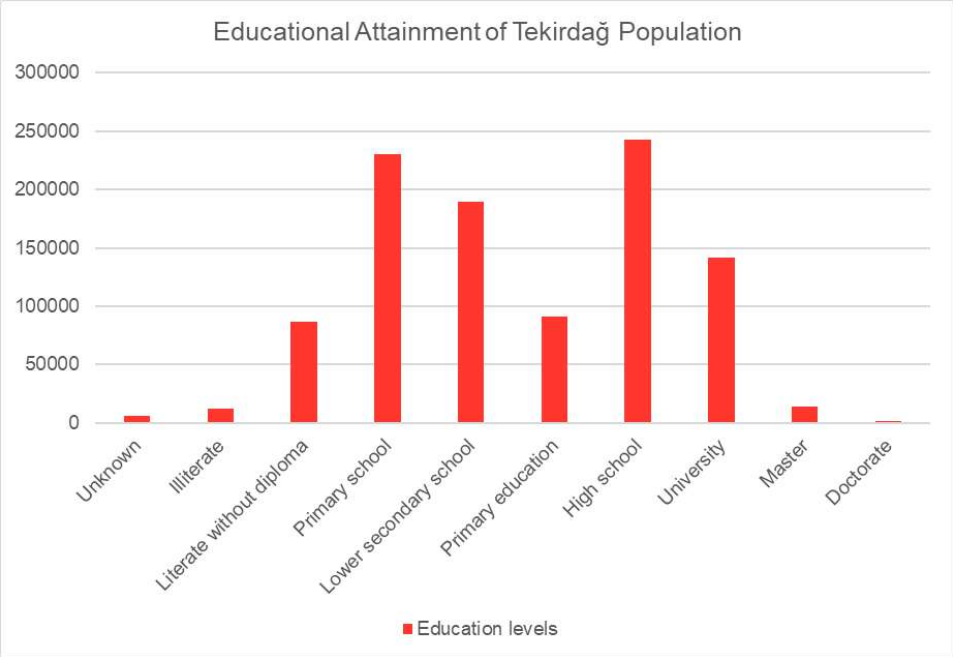
## *Literacy and Education levels*

The proportion of both province and district population by literacy and educational levels as 2023 are presented in the following sections.




- In İstanbul, high school graduates are the largest group of people in the province, followed by primary school and university graduates.

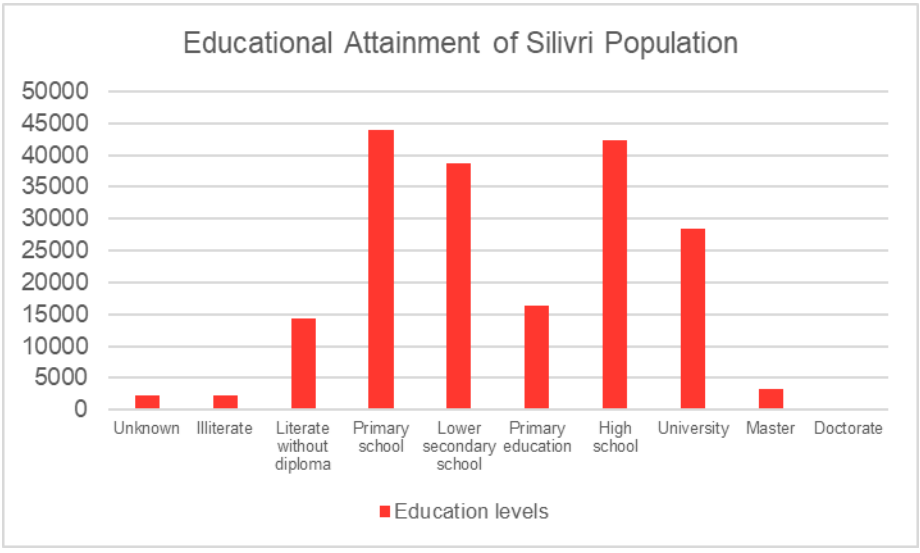
**Figure 116: Educational Attainment of İstanbul Population**

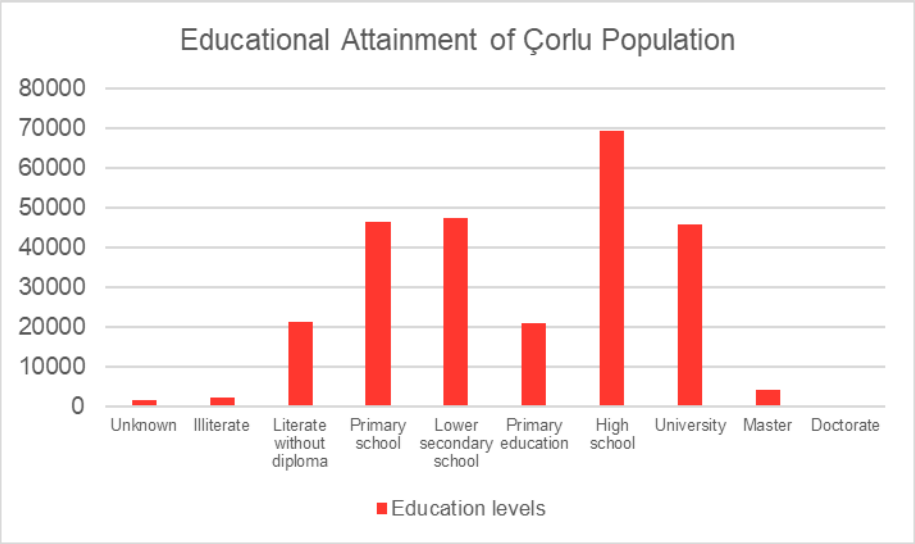
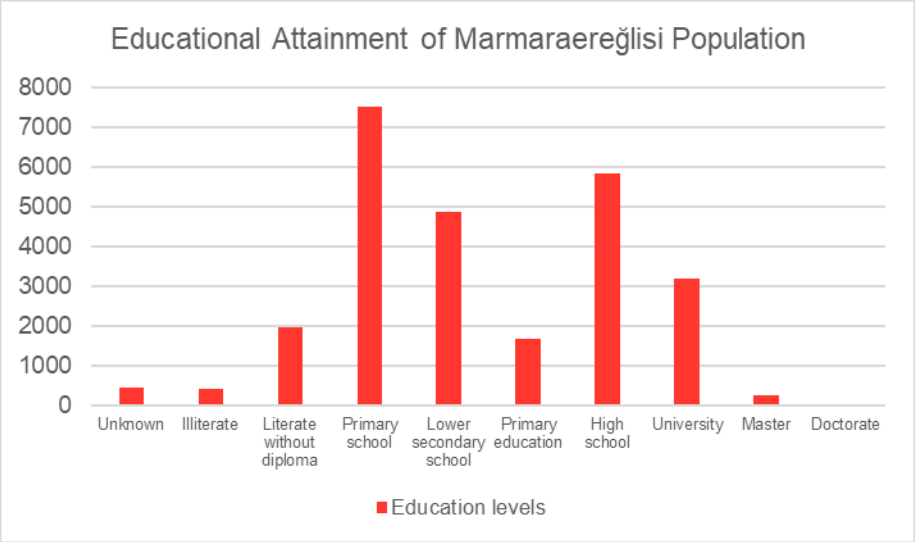
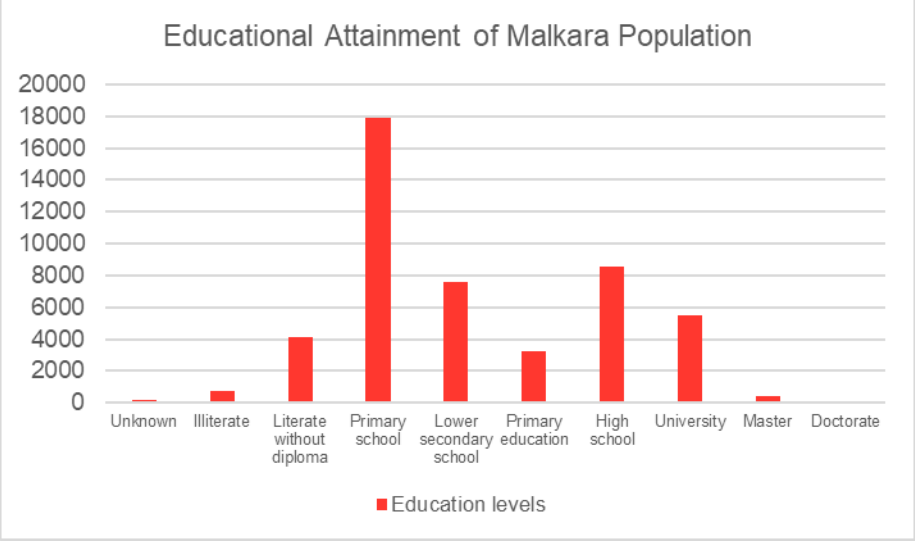


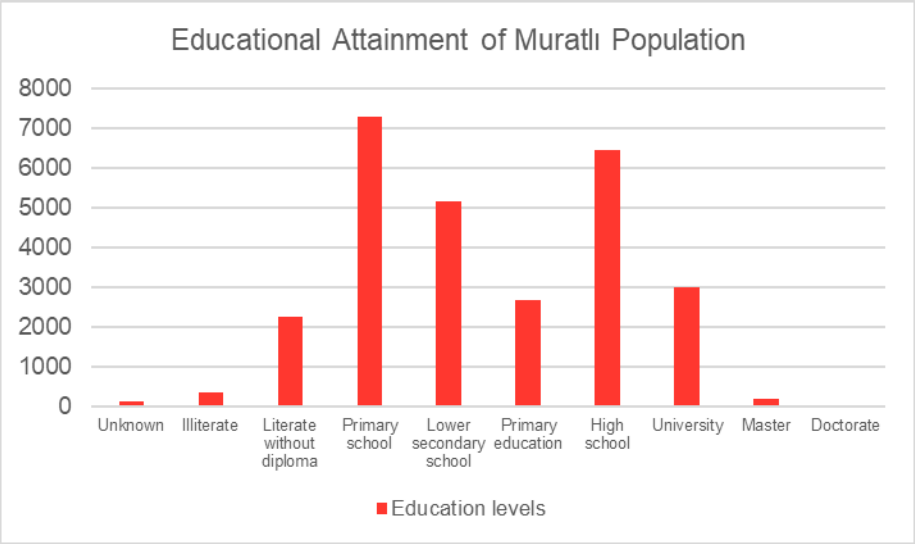
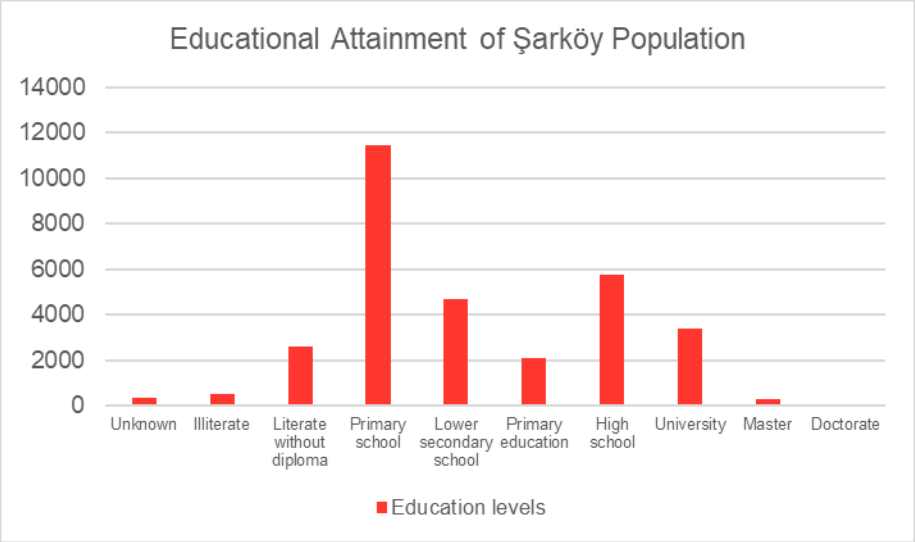
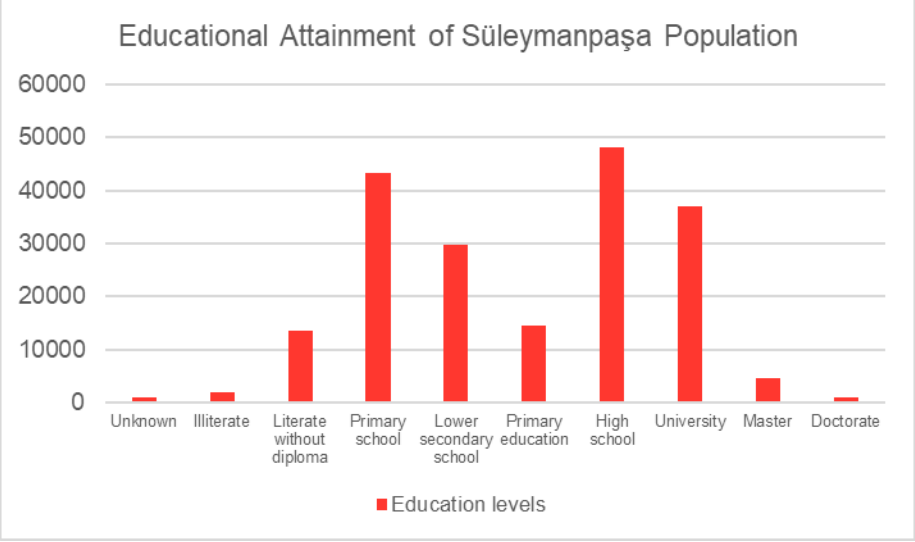

- In Tekirdağ, primary school and high school graduates are the two largest group of people in the province, followed by lower secondary school and university graduates.

**Figure 117: Educational Attainment of Tekirdağ Population**

**Table 122: Education Levels of Population of Districts**

| Province | District | Educational Levels |
|---|---|---|
| **İstanbul** | **Silivri** |  |

| Province | District | Educational Levels |
|---|---|---|
| **Tekirdağ** | **Çorlu** |  |
| | **Marmaraereğlisi** |  |
| | **Malkara** |  |

| Province | District | Educational Levels |
|---|---|---|
| | **Muratlı** |  |
| | **Şarköy** |  |
| | **Süleymanpaşa** |  |







*Source:* (TURKSTAT, Population and Housing Census, 2023)

### *Access to Higher Education*

According to the Governorship of İstanbul, there are 57 universities in İstanbul, including 13 state universities, 44 foundation universities and 3 foundation vocational schools. In addition, there are Air and Naval Military Colleges and 4 foundation vocational schools that are not affiliated with any university. İstanbul is home to 30.3 percent of universities in Türkiye. As of March 2024, the total number of students studying in higher education is 7,830,000. 553,203 students study at state universities, 440,586 at foundation universities, and 8,045 at foundation vocational schools.

Tekirdağ Namık Kemal University is the only university in the Tekirdağ Province. The total number of students as of June 2024 is 30,958 in 2006, the university has 11 faculties, 1 state conservatory, 3 institutes, 12 vocational schools of higher education, 16 research and application centres and 5 department heads. There are 55 undergraduate and 100 graduate programs at the university. In 12 vocational schools of higher education, there are 51 departments. Some of the vocational schools are located in the districts of AoI in Tekirdağ, which are as follows:

- Şarköy Vocational School
- Marmaraereğlisi Vocational School
- Çorlu Vocational School
- Malkara Vocational School

#### 6.3.1.10.3 Neighbourhood Level

##### *Education Facilities and Personnel*

The existence of schools in the neighbourhood were asked to Mukhtars during the field study. The schools and their proximity to the neighbourhoods are presented in Table 123.

**Table 123: Schools in the neighbourhoods**

| District | Neighbourhood | Does neighbourhood have a preschool? | Nearest preschool and proximity | Does neighbourhood have a primary school? | Nearest primary school and proximity | Does neighbourhood have a lower secondary school? | Nearest lower secondary school and proximity | Does neighbourhood have a secondary school (high school)? | Nearest secondary school and proximity |
|---|---|---|---|---|---|---|---|---|---|
| Silivri | Değirmenköy Fevzipaşa | Yes | | Yes | | Yes | | Yes | |
| | Alipaşa | Yes | | Yes | | Yes | | No | Silivri – 7 km |
| | Semizkumlar | Yes | | Yes | | Yes | | Yes | |
| | Çeltik | Yes | | Yes | | No | Çantaköy – 10 km | No | Silivri – 18 km |
| | Yolçatı | Yes | | Yes | | No | Çantaköy – 3 km | No | Silivri – 22 km |
| | Çanta Sancaktepe | No | Çantaköy – 2 km | No | Çantaköy – 2 km | No | Çantaköy – 2 km | No | |
| | Çanta Balaban | Yes | | Yes | | Yes | | Yes | |
| | Gümüşyaka | Yes | | Yes | | Yes | | Yes | |
| | Danamandıra | Yes | | Yes | | - | | No | Silivri – 38 km |
| Çorlu | Seymen | Yes | | Yes | | No | Önerler – 15 km | No | Çorlu – 15 km |
| | Şahbaz | No | Çorlu – 12 km | No | Önerler – 8 km | No | Önerler – 8 km | No | Önerler – 8 km |
| | Türkgücü | Yes | | Yes | | No | Önerler – 10 km | No | OSB – 6 km |
| | Yenice | Yes | | - | | - | | - | |

| District | Neighbourhood | Does neighbourhood have a preschool? | Nearest preschool and proximity | Does neighbourhood have a primary school? | Nearest primary school and proximity | Does neighbourhood have a lower secondary school? | Nearest lower secondary school and proximity | Does neighbourhood have a secondary school (high school)? | Nearest secondary school and proximity |
|---|---|---|---|---|---|---|---|---|---|
| | Maksutlu | No | Çorlu – 17 km | No | Çorlu – 17 km | No | Çorlu – 17 km | No | Çorlu – 17 km |
| Marmaraereğlisi | Türkmenli | No | Yeniçiftlik – 3 km | No | Yeniçiftlik – 3 km | No | Yeniçiftlik – 3 km | No | Yeniçiftlik – 3 km |
| | Yakuplu | No | Yeniçiftlik – 10 km | No | Yeniçiftlik – 10 km | No | Yeniçiftlik – 10 km | No | Yeniçiftlik – 10 km |
| | Çeşmeli | No | Yeniçiftlik – 5 km | No | Yeniçiftlik – 5 km | No | Yeniçiftlik – 5 km | No | Çorlu – 15 km |
| Süleymanpaşa | Aydoğdu | Yes | | Yes | | Yes | | Yes | |
| | Karaevli | No | Tekirdağ – 15 km | No | Tekirdağ – 15 km | No | Tekirdağ – 15 km | No | Tekirdağ – 15 km |
| | Gazioğlu | No | Değirmenaltı – 13 km | No | Değirmeanaltı – 13 km | No | Değirmenaltı – 13 km | No | Değirmenaltı – 13 km |
| | Köseilyas | Yes | | Yes | | Yes | | Yes | |
| | Husunlu | No | Değirmenaltı – 7 km | No | Değirmenaltı – 7 km | No | Değirmenaltı – 7 km | No | Değirmenaltı – 7 km |
| | Çiftlikönü (Gündoğdu) | Yes | | Yes | | Yes | | Yes | |
| | İstiklal (Eskicami) | No | Tekirdağ – 14km | No | Tekirdağ – 14km | No | Tekirdağ – 14km | No | Tekirdağ – 14km |
| | Karahisarlı | No | Tekirdağ – 13 km | No | Tekirdağ – 13 km | No | Tekirdağ – 13 km | No | Tekirdağ – 13 km |

| District | Neighbourhood | Does neighbourhood have a preschool? | Nearest preschool and proximity | Does neighbourhood have a primary school? | Nearest primary school and proximity | Does neighbourhood have a lower secondary school? | Nearest lower secondary school and proximity | Does neighbourhood have a secondary school (high school)? | Nearest secondary school and proximity |
|---|---|---|---|---|---|---|---|---|---|
| | Kayı | No | Tekirdağ – 5 km | No | Tekirdağ – 5 km | No | Tekirdağ – 5 km | No | Tekirdağ – 5 km |
| | Yağcı | No | Süleymanpaşa – 8 km | No | Süleymanpaşa – 8 km | No | Süleymanpaşa – 8 km | No | Süleymanpaşa – 8 km |
| | Zafer | Yes | | Yes | | Yes | | Yes | |
| | Osmanlı | No | Süleymanpaşa – 15 km | No | Süleymanpaşa – 15 km | No | Süleymanpaşa – 15 km | No | Süleymanpaşa – 15 km |
| | Seymenli | No | İnecik – 8 km | No | İnecik – 8 km | No | İnecik – 8 km | No | İnecik – 8 km |
| | Güveçli | No | İnecik – 9 km | No | İnecik – 9 km | No | İnecik – 9 km | No | İnecik – 9 km |
| | Nusratfakı | No | İnecik – 5 km | No | İnecik – 5 km | No | İnecik – 5 km | No | İnecik – 5 km |
| | İnecik | Yes | | Yes | | Yes | | No | Tekirdağ – 20 km |
| | Nusratlı | No | Yüzüncü Yıl – 6 km | No | Yüzüncü Yıl – 6 km | No | Yüzüncü Yıl – 6 km | No | Yüzüncü Yıl – 6 km |
| | Mahramlı | No | İnecik – 7 km | No | İnecik – 7 km | No | İnecik – 7 km | No | Tekirdağ – 28 km |
| | Kınıklar | No | İnecik – 10 km | No | İnecik – 10 km | No | İnecik – 10 km | No | Tekirdağ – 35 km |
| Malkara | Dereköy | No | Müstecep – 9 km | No | Müstecep – 9 km | No | Malkara – 20 km | No | Malkara – 20 km |

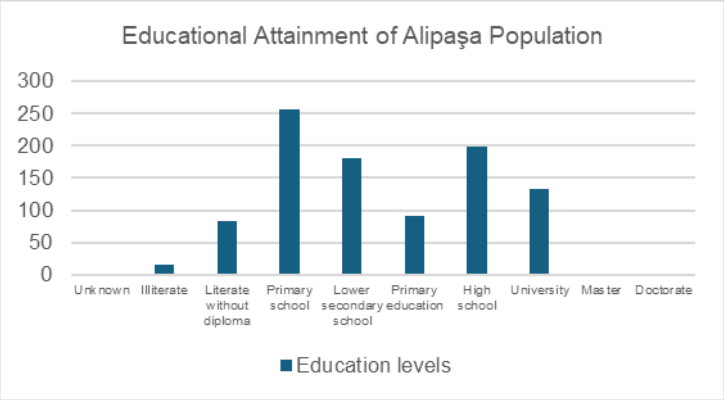
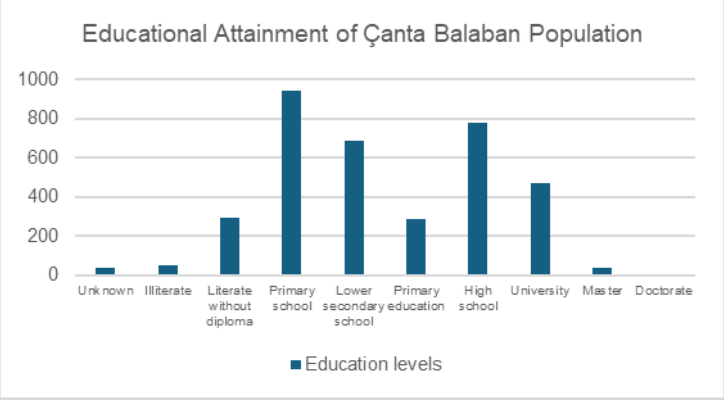
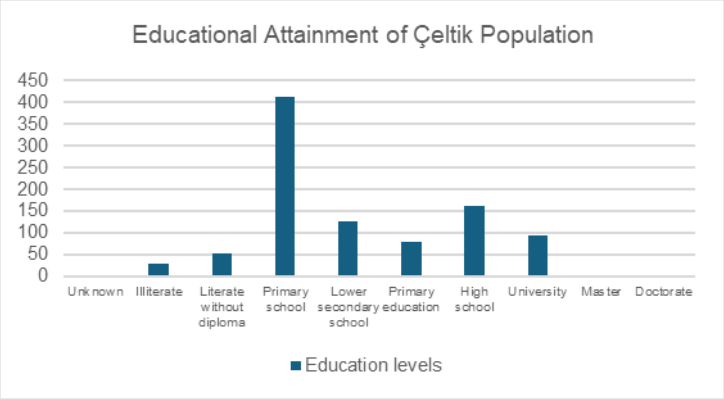
| District | Neighbourhood | Does neighbourhood have a preschool? | Nearest preschool and proximity | Does neighbourhood have a primary school? | Nearest primary school and proximity | Does neighbourhood have a lower secondary school? | Nearest lower secondary school and proximity | Does neighbourhood have a secondary school (high school)? | Nearest secondary school and proximity |
|---|---|---|---|---|---|---|---|---|---|
| | Yenice | No | İnecik – 20 km | No | Yörüklü – 10 km | No | Yörüklü – 10 km | No | Malkara – 23 km |
| | Hereke | No | Yörükköy – 9 km | No | Yörükköy – 9 km | No | Yörükköy – 9 km | No | Yörükköy – 9 km |
| | Ahievren | No | Malkara – 12 km | No | Malkara – 12 km | No | Malkara – 12 km | No | Malkara – 12 km |
| Şarköy | Tepeköy | No | Eriklice – 6 km | No | Eriklice – 6 km | No | Eriklice – 6 km | No | Eriklice – 6 km |
| Muratlı | Yukarısırt | No | Muratlı – 5 km | No | Muratlı – 5 km | No | Muratlı – 5 km | No | Muratlı – 5 km |

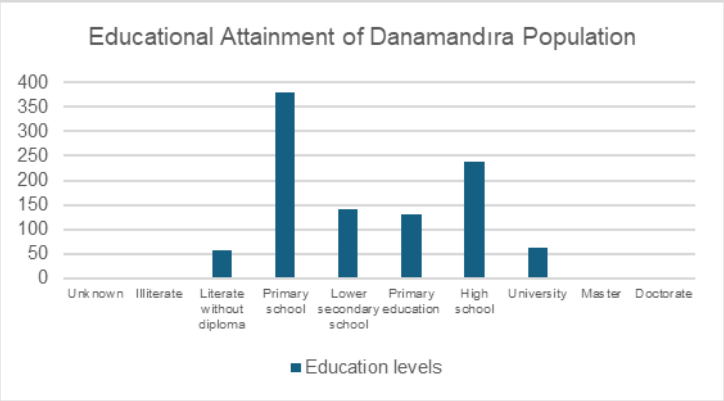
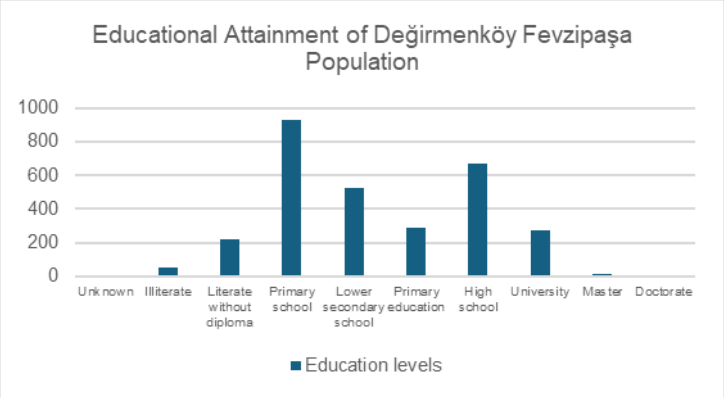
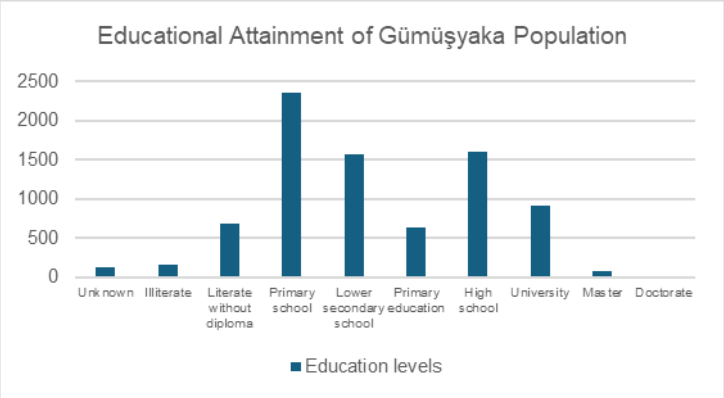
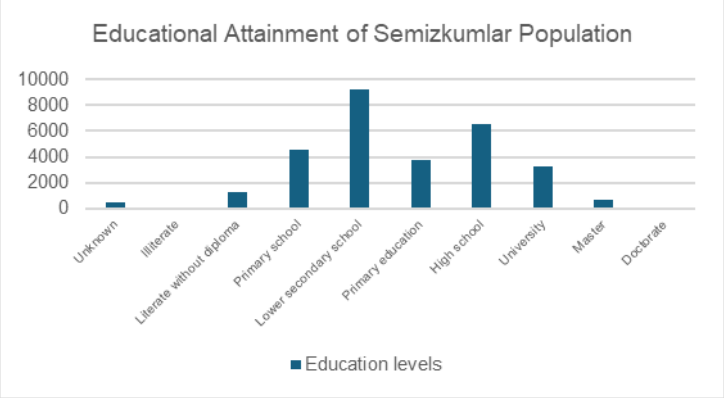
Transported education is the education carried out in neighbourhoods with low populations and dispersed settlements by the daily transportation of students within the scope of compulsory education to central schools in larger settlements such as districts and provinces (The Ministry of National Education, 2022).

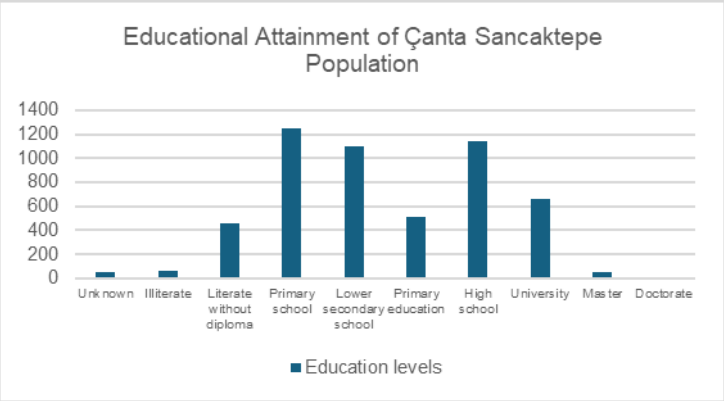
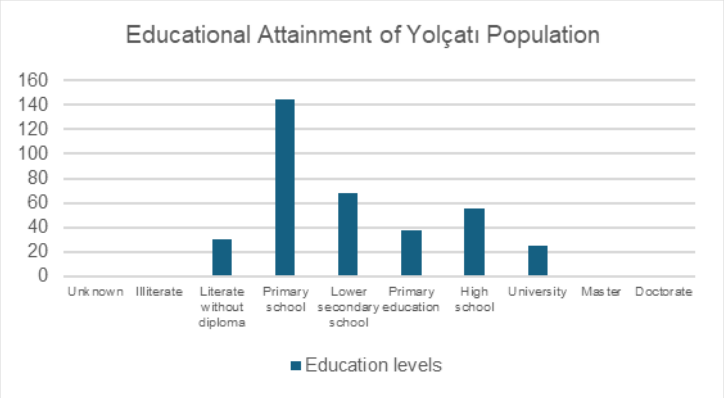
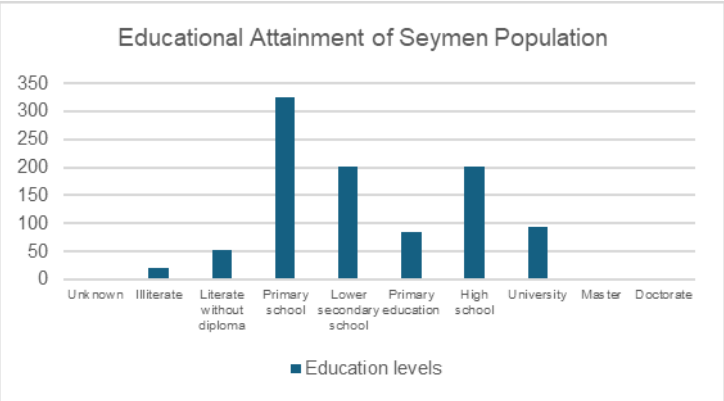
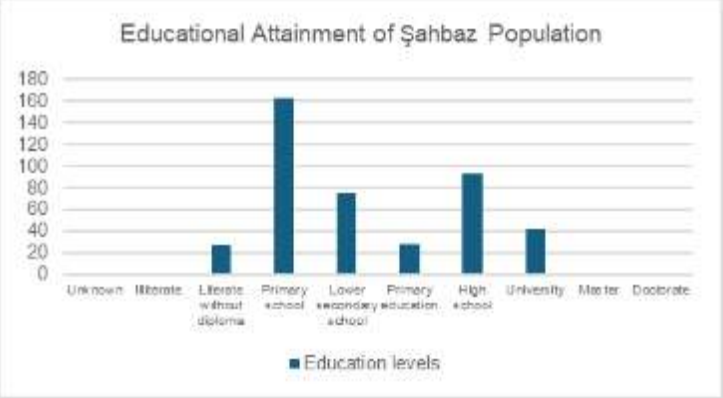
### *Education Levels*

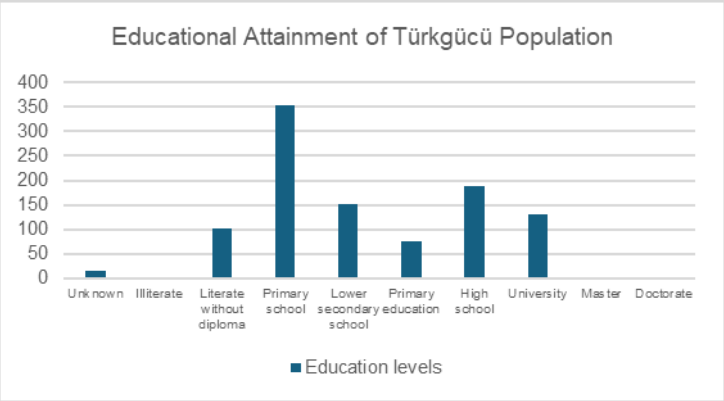
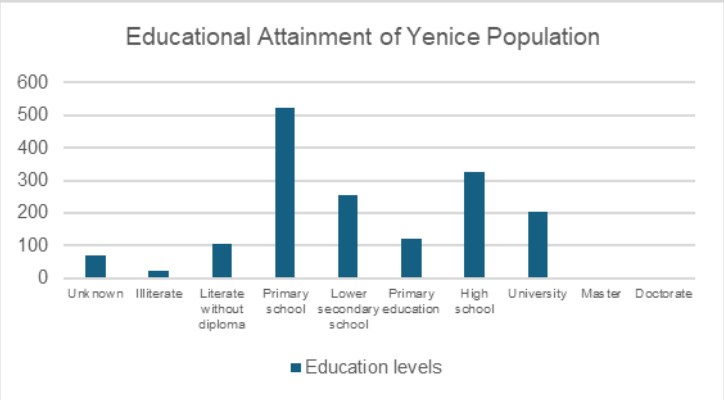
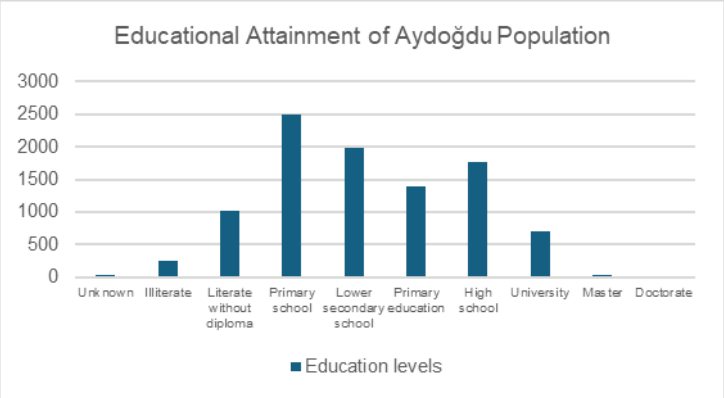
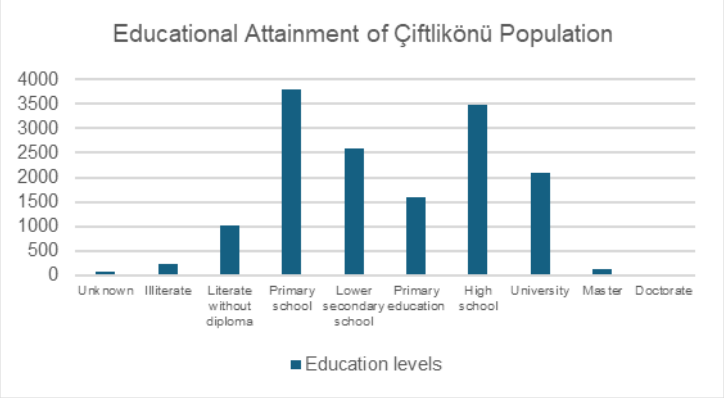
Education levels of the neighbourhood population was gathered from both the TURKSTAT data and the Mukhtars provided in Table 124.

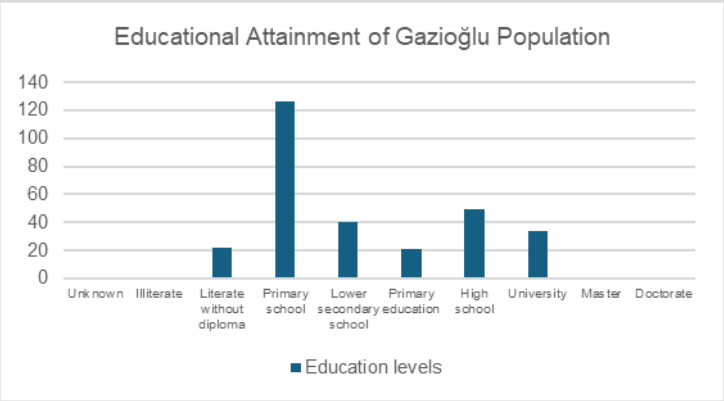
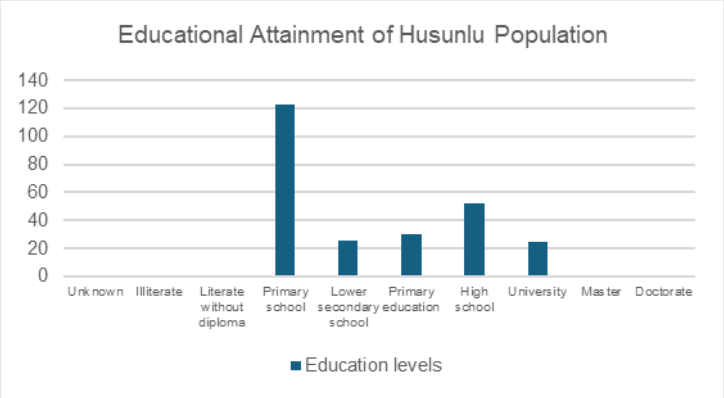
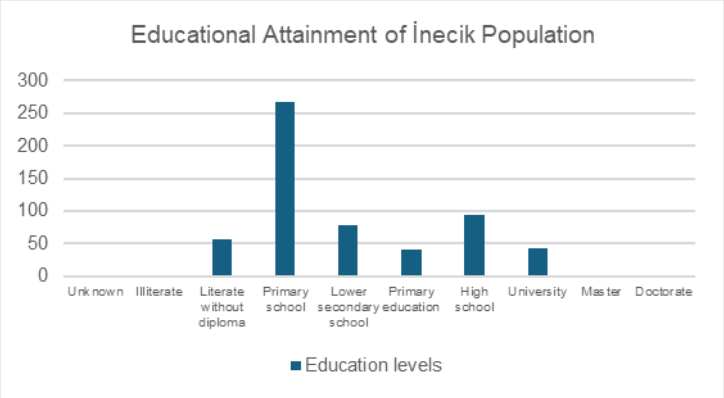
**Table 124: Education Levels of the Neighbourhood Population**

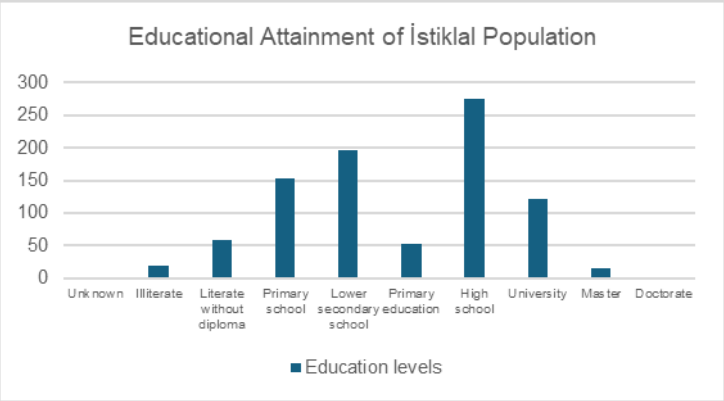
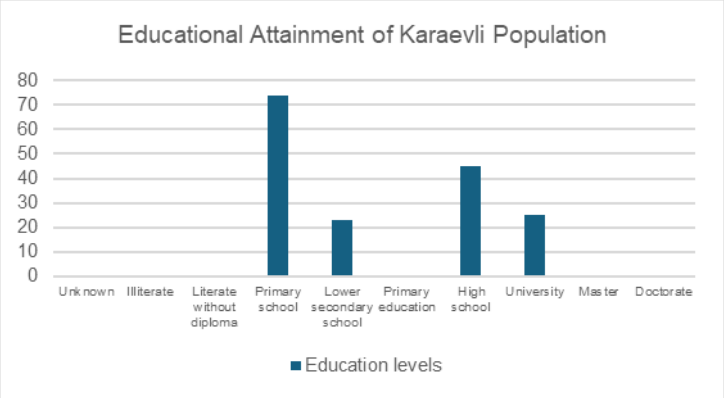
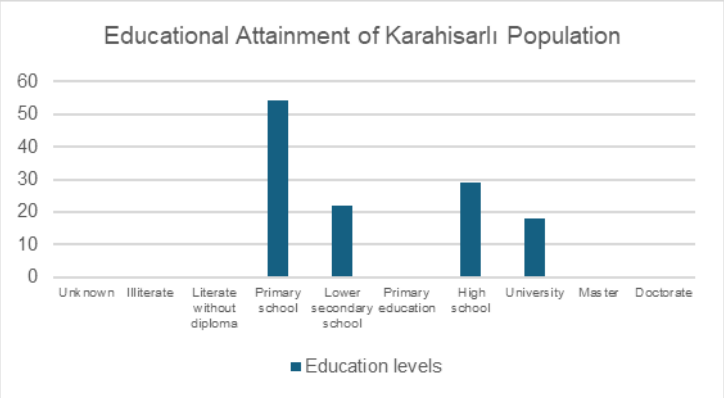
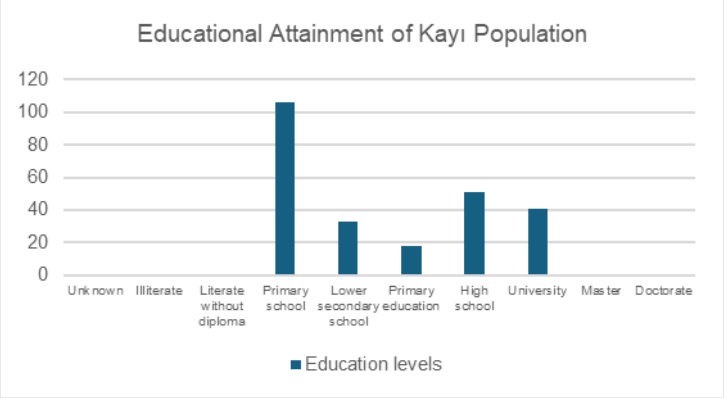
| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| **İstanbul** | **Silivri** | Alipaşa |   |
| | | Çanta Balaban |   |
| | | Çeltik |   |

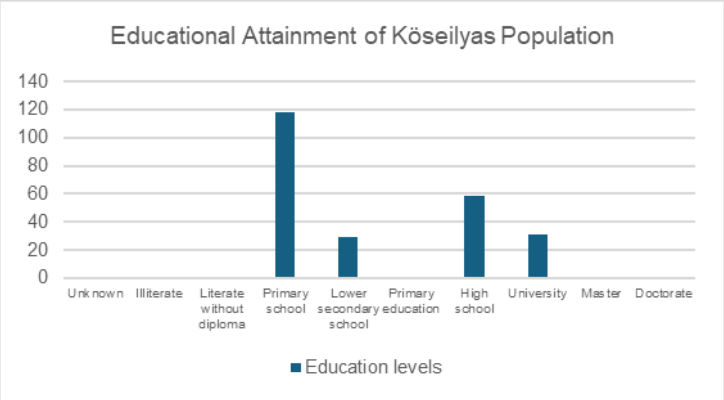
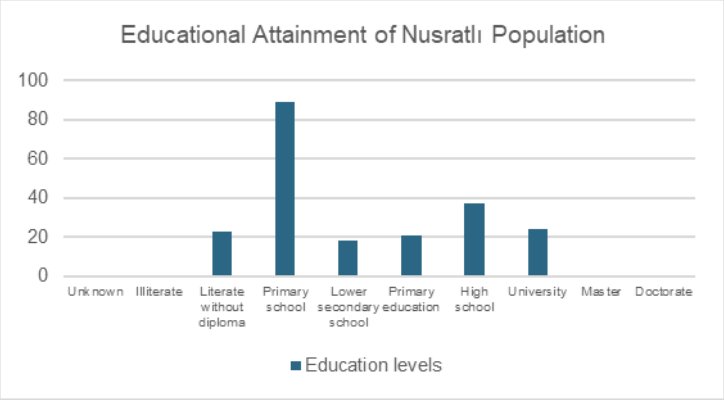
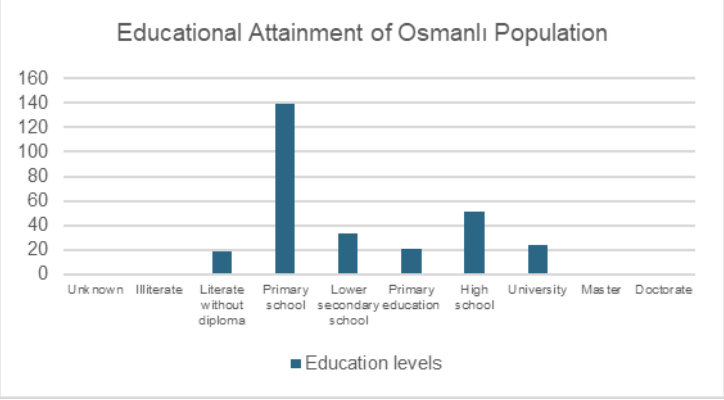
| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Danamandıra |  |
| | | Değirmenköy (Fevzipaşa) |  |
| | | Gümüşyaka |  |
| | | Semizkumlar |  |

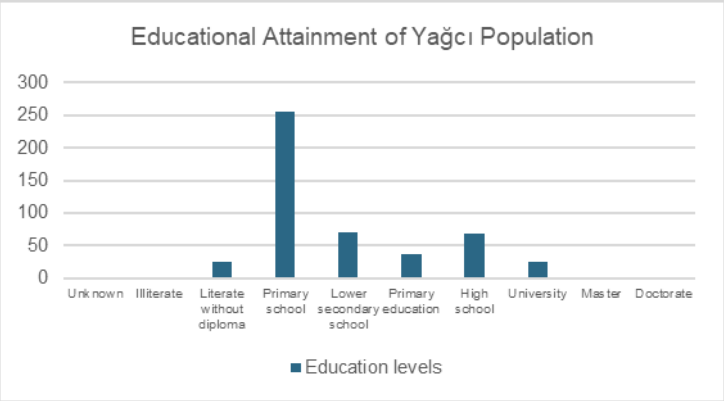
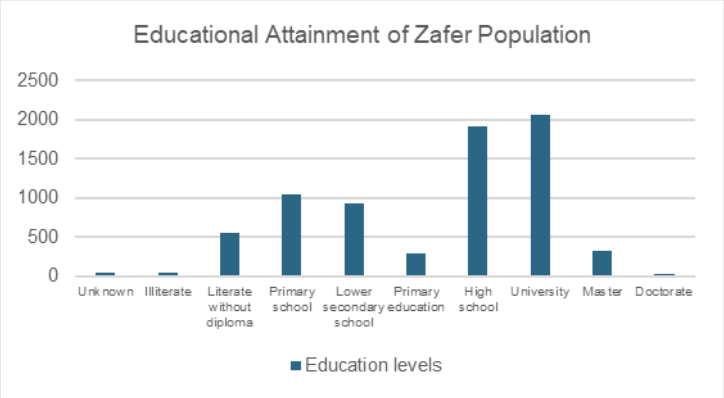
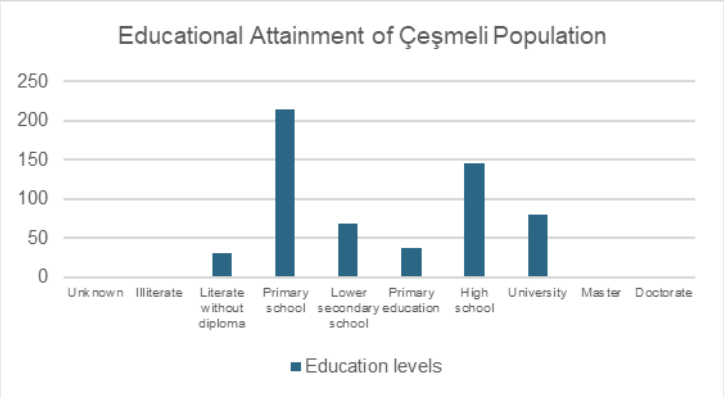
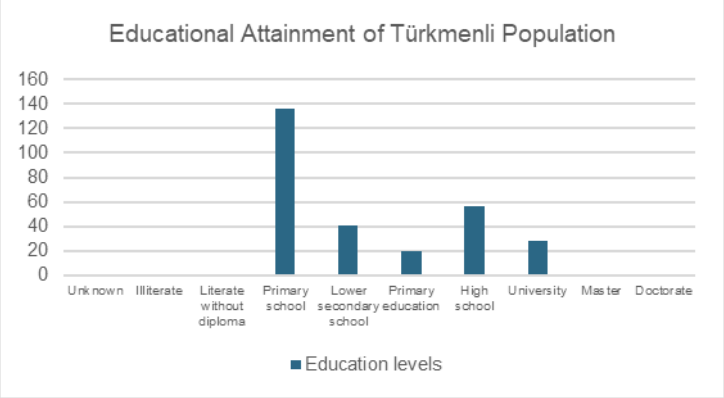
| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Çanta Sancaktepe |  |
| | | Yolçatı |  |
| **Tekirdağ** | **Çorlu** | Maksutlu | Unknown |
| | | Seymen |  |
| | | Şahbaz |  |

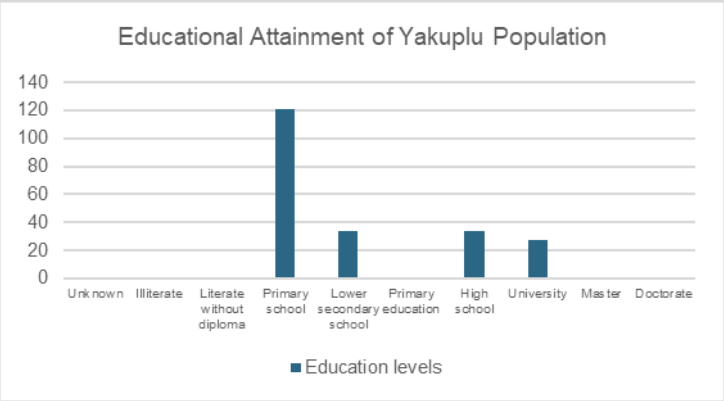
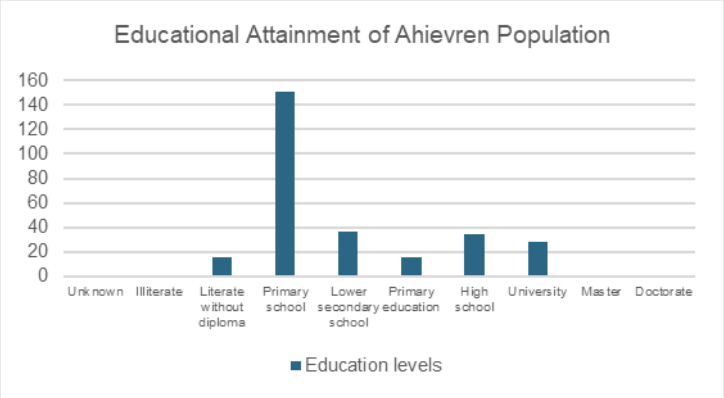
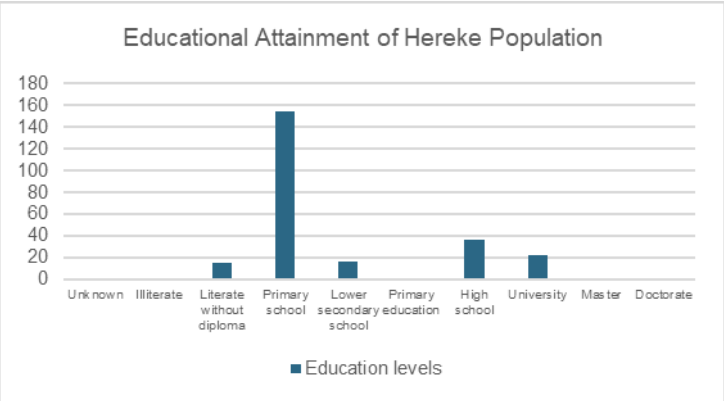
| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Türkgücü |  |
| | | Yenice |  |
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu |  |
| | | Çiftlikönü (Gündoğdu) |  |

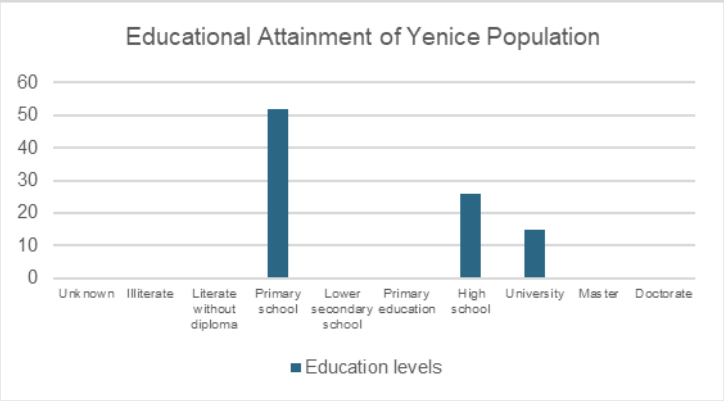
| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Gazioğlu |  |
| | | Güveçli | Unknown |
| | | Husunlu |  |
| | | İnecik |  |

| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | İstiklal (Eskicami) |  |
| | | Karaevli |  |
| | | Karahisarlı |  |
| | | Kayı |  |

| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Kınıklar | Unknown |
| | | Köseilyas |  |
| | | Mahramlı | Unknown |
| | | Nusratfakı | Unknown |
| | | Nusratlı |  |
| | | Osmanlı |  |
| | | Seymenli | Unknown |

| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Yağcı |  |
| | | Zafer |  |
| **Tekirdağ** | **Marmaraereğlisi** | Çeşmeli |  |
| | | Türkmenli |  |

| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Yakuplu |  |
| **Tekirdağ** | **Malkara** | Ahievren |  |
| | | Dereköy | Unknown |
| | | Hereke |  |

| Province | District | Neighbourhood | Education Levels |
|---|---|---|---|
| | | Yenice |  |
| **Tekirdağ** | **Muratlı** | Yukarısırt | Unknown |
| **Tekirdağ** | **Şarköy** | Tepeköy | Unknown |

*Source:* (TURKSTAT, Population and Housing Census, 2023)

#### *6.3.1.11 Health*

##### 6.3.1.11.1 Introduction

Health issues and facilities aim at identifying the main health determinants in the AoI, the presence of health structures and the level of service provided to local communities. This section aims to provide information on health indicators of İstanbul, Silivri and the local AoI. Also, Tekirdağ, Çorlu, Marmaraereğlisi, Süleymanpaşa, Malkara, Muratlı, Şarköy and local AoI. The baseline information presented in this section has been gathered from household surveys, key informant interviews and relevant secondary data.

##### 6.3.1.11.2 Province and District Level

###### *Healthcare Facilities and Personnel*

According to the Provincial Heath Directorate of İstanbul, 908 institutions provide health services in İstanbul. The city has 147 Private Hospitals, 196 Medical Centres, 173 Oral and Dental Health Centres, 69 Dialysis Centres, 235 Polyclinics, 17 Eye Diseases Centres, 58 State Hospitals, and 13 University Hospitals. As of 2023, the total number of available beds in the province is 47,968. A total of 201,626 health personnel, including 24,033 specialist physicians and 9,067 general practitioners, work in İstanbul (including the Faculty of Medicine and private hospitals), and there are 2.8 doctors per thousand people.

Some selected health-related statistics of İstanbul Province as of 2022 data are presented in Table 125.

**Table 125: Health Indicators of İstanbul**

| Health Indicators | Quantity |
|---|---|
| Number of Hospitals | 218 |
| Number of Bed | 47,968 |
| Number of Hospital Bed per 10,000 Population | 30.2 |
| Number of Qualified Bed | 31,509 |
| Number of Intensive Care Unit Bed | 82.1 |

| Health Indicators | Quantity |
|---|---|
| Proportion of Qualified Bed[153] | 234 |
| Intensive Care Unit Bed per 10,000 Population | 6 |
| Number of Family Medicine Unit | 4,992 |
| Population per Family Medicine Unit | 3,187 |

*Source:* (General Directorate of Health Service & General Directorate of Public Health, 2024)

These hospitals listed below are located in Silivri, İstanbul.

- Prof. Doctor Necmi Ayanoğlu Silivri State Hospital
- Silivri DiyaCenter Dialysis Centre
- Private Medical Park Silivri Hospital
- Private Silivri Kolan Hospital
- Marmara Penal Institution State Hospital

According to the Provincial Heath Directorate of Tekirdağ, 36 institutions provide health services in Tekirdağ. The city has 10 State Hospitals, 4 Private Hospitals, 1 Oral and Dental Health Centres, 5 Dialysis Centres, 2 Eye Diseases Centres, 1 University Hospital, 9 Polyclinic, 1 City Hospital. The total number of available beds in the province is 3,223. A total of 10,604 health personnel, including 971 specialist physicians and 660 general practitioners, work in Tekirdağ (including the Faculty of Medicine and private hospitals), and there are 1.6 doctors per thousand people.

Some selected health-related statistics of Tekirdağ Province as of 2022 data are presented in Table 101.

**Table 126: Health Indicators of Tekirdağ**

| Health Indicators | Quantity |
|---|---|
| Number of Hospitals | 16 |
| Number of Bed | 3,223 |
| Number of Hospital Bed per 10,000 Population | 289 |
| Number of Qualified Bed | 2,247 |
| Number of Intensive Care Unit Bed | 732 |
| Proportion of Qualified Bed[154] | 90.2 |
| Intensive Care Unit Bed per 10,000 Population | 6.4 |
| Number of Family Medicine Unit | 353 |
| Population per Family Medicine Unit | 3,236 |

*Source:* (General Directorate of Health Service & General Directorate of Public Health, 2024)

[153] Intensive care unit beds are not included.

[154] Intensive care unit beds are not included.

Tekirdağ City Hospital was put into service in 2020 by the Ministry of Health and Akfen Group with the Public-Private Partnership model. The hospital, with a bed capacity of 605, was established on a total construction area of 159,000 $m^2$.

**Main Hospital**

- Number of Beds: 605
- Number of Polyclinics: 128
- Number of Operating Rooms: 18
- Number of Intensive Care Units: 119
- Palliative Care Centre: 22
- Sleep Labs: 6
- LDR Rooms: 5

The proximity of the districts of AoI to Tekirdağ City Hospital are as follows:

- Çorlu = 38 km
- Marmaraereğlisi = 47 km
- Malkara = 72 km
- Şarköy = 97 km
- Süleymanpaşa = 12 km

Tekirdağ City Hospital is located in the Süleymanpaşa district. In addition, there are also state hospitals in the districts of AoI, which are Çorlu State Hospital, Marmaraereğlisi State Hospital, Malkara State Hospital, and Şarköy State Hospital.

#### 6.3.1.11.3 Neighbourhood Level

During the social field study, the quality of the healthcare services was questioned at the local level. It was informed that there are primary healthcare units in most neighbourhoods, yet; some neighbourhoods lack healthcare services because there are no primary healthcare units. These primary health care units are meeting only the primary health needs of the communities, and for the more complicated health problems, locals are using city hospitals if possible.

Total of 19 neighbourhood in AoI have no healthcare units (refer to the Table 139), doctors make visits and visits are insufficient since such service is only available for a few days a month. Also, in neighbourhoods distant from the city centre, doctors cannot make frequent visits which cause communities to lack access to health care.

### *6.3.1.12 Utilities, Infrastructure, and Services*

#### 6.3.1.12.1 Introduction

This section provides baseline information on infrastructure and services in the Project impact area, including housing, water sources, wastewater and sanitation, electricity, heating source, waste disposal, fire services, police service, telecommunication, transportation and public space and recreation. Infrastructure and services are key social components that allow having an understanding of the type of infrastructures present in the AoI, of the access for local communities and of the level of services provided. Baseline information is presented from

the İstanbul and Tekirdağ and the districts of Silivri, Çorlu, Marmaraereğlisi, Süleymanpaşa, Malkara, Muratlı and Şarköy located in the AoI through the information gathered through the secondary and the primary data.

#### 6.3.1.12.2 Province and District Level

***Housing***

The data for the construction and housing of the İstanbul Province is presented in Table 127.

**Table 127: Data for the Construction and Housing of İstanbul Province**

| Number of Buildings by Building License | Number of Flats by Building License | Surface Area According to Building License ($m^2$) | Number of Buildings by Occupancy Permit | Number of Flats by Occupancy Permit | Surface Area According to the Occupancy Permit |
|---|---|---|---|---|---|
| **16,779** | 158,921 | 32,634,429 | 9,911 | 91,369 | 17,106,557 |

*Source: TURKSTAT, 2023*

The data for the construction and housing of the Tekirdağ Province is presented in Table 128.

**Table 128: Data for the Construction and Housing of Tekirdağ Province**

| Number of Buildings by Building License | Number of Flats by Building License | Surface Area According to Building License ($m^2$) | Number of Buildings by Occupancy Permit | Number of Flats by Occupancy Permit | Surface Area According to the Occupancy Permit |
|---|---|---|---|---|---|
| **4,082** | 22,338 | 3,641,341 | 1,775 | 11,930 | 1,992,507 |

*Source: TURKSTAT, 2023*

The latest data on housing by ownership status and number of rooms of housing unit for İstanbul and Tekirdağ is presented in Table 129 and Table 130.

**Table 129: Number of Households by Ownership Status of Housing Unit**

| Province | Total Number of Households | Owner (%) | Tenant (%) | Other (%) | Unknown |
|---|---|---|---|---|---|
| **Tekirdağ** | 349,057 | 60.5 | 23.5 | 10 | 6 |
| **İstanbul** | 4,755,086 | 52.6 | 37.1 | 7.5 | 2.8 |

*Source: TUKSTAT, 2021*

**Table 130: Number of Households by Number of Rooms in the Housing Unit**

| Province | Total Number of Households | Number of Rooms (%) | | | |
|---|---|---|---|---|---|
| | | **1-2** | **3** | **4** | **5+** |
| **Tekirdağ** | 349,057 | 5.1 | 43.1 | 46.2 | 5.6 |
| **İstanbul** | 4,755,086 | 6.1 | 52.1 | 36.8 | 4.9 |

*Source: Turkish Statistical Institute, 2021*

### *Water Sources (drinking, utility, irrigation)*

The water sources are divided into surface water and groundwater. Streams, natural lakes, ponds and reservoirs are surface waters. According to 2022 Environmental Status Reports, some selected stream data of İstanbul and Tekirdağ Provinces are presented in Table 131 and Table 132.

Assessments have indicated that there are no crossings between the route and the rivers within the Istanbul Province. The only river crossing in the Tekirdağ Province is at the Seymen River at 43+330 km of the route.

**Table 131: Rivers of İstanbul Province**

| Stream Name | Total Length (km) | Provincial Boundaries in Length (km) | Flowrate ($m^3$/sec) | Tributary Stream |
|---|---|---|---|---|
| **Istranca** | - | - | 2.06 | |
| **Karasu** | 70 | - | 1.65 | - |
| **Sarısu** | 25 | - | 0.74 | - |
| **Göksu** | - | 25 | 5.75 | - |
| **Çakıl** | - | - | 0.33 | - |
| **Yılgındere** | - | - | 0.28 | - |
| **Kabakozdere** | - | - | 1.26 | - |
| **Çanakdere** | - | - | 4.21 | - |
| **Ozan dere** | - | - | 1.4 | - |
| **Göçbeyli** | - | - | - | - |
| **Sazlıdere** | 40 | - | - | - |
| **Riva** | 100 | - | - | - |
| **Hiciv** | 50 | - | - | - |
| **Kuzuludere** | - | - | - | - |
| **Düzdere** | - | - | - | - |
| **Nakkaş** | - | - | - | - |
| **Alibeyköy** | 50 | - | - | - |
| **Kağıthane** | - | - | - | - |

*Source: İstanbul Province Environmental Status Report, 2023*

**Table 132: Rivers of Tekirdağ Province**

| Stream Name | Total Length (km) | Provincial Boundaries in Length (km) | Flowrate ($m^3$/sec) | Tributary Stream |
|---|---|---|---|---|
| **Ergene** | 220 | 85 | 26.5 | Meriç |
| **Hayrabolu** | 55 | 55 | 4.4 | Ergene Stream |
| **Çorlu** | 85 | 85 | 2.7 | Ergene Stream |
| **Beşiktepe** | 92.8 | 92.8 | 2.04 | Ergene Stream |

| Stream Name | Total Length (km) | Provincial Boundaries in Length (km) | Flowrate ($m^3$/sec) | Tributary Stream |
|---|---|---|---|---|
| **Koca** | 52 | 44 | 1.4 | Koca Stream |
| **Seymen** | 16.5 | 16.5 | - | Seymen Stream |
| **Hoşköy** | 14.6 | 14.6 | - | Hoşköy Stream |
| **Kayı** | 12.9 | 12.9 | - | Kayı Stream |
| **Gazioğlu** | 13.3 | 13.3 | - | Gazioğlu |

*Source: Tekirdağ Province Environmental Status Report, 2023*

According to the İstanbul Province 2022 Year Environmental Status Report, drinking and potable waters are provided from these sources; Darlık, Alibey, Sazlıdere, Kazandere and Pabuçdere Dams; Melen, Sakarya, Yeşilçay İsaköy, Yeşilçay Sungurlu, Yeşilvadi, Düzdere, Kuzuludere, Büyükdere, Elmalıdere and Sultanbahçedere Regulators.

According to the Tekirdağ Province 2022 Year Environmental Status Report, drinking and potable waters are provided from these sources; Türkmenli Pond, Naip Dam Lake, Şarköy Pond, Müstecep Pond, and water wells.

### *Wastewater and Sanitation*

As of 2022, Istanbul has 89 wastewater treatment facilities at the level of physical, biological, and advanced treatment. Total of 40 municipalities in the province are served by wastewater treatment plants. The wastewater treatment plants located in the District of Silivri at the level of physical, biological, and advanced treatment (İstanbul Province 2022 Environmental Status Report, 2023).

Tekirdağ has wastewater treatment plants in the city centre and in its districts. As of 2022, Tekirdağ has 19 wastewater treatment facilities at the level of physical, biological, and advanced treatment. The wastewater treatment plants located in the districts of Çorlu, Muratlı, Süleymanpaşa, and Malkara is also at the level of physical, biological, and advanced treatment. The wastewater treatment plants located in the District of Marmaraereğlisi one of it at the level of physical, biological and advanced treatment, two of its level of physical and biological. The wastewater treatment plants located in the district of Şarköy is at the level of physical treatment (Tekirdağ Province 2022 Environmental Status Report, 2023).

In Tekirdağ there are ten Organized Industrial Zones. Two of them is located at Çorlu, one of it is located at Malkara and the others are located at Çerkezköy, Muratlı, Velimeşe, Ergene, Hayrabolu, and European Free Zone. In these Organized Industrial Zones, there are treatment plants for domestic wastewater. Also, in some businesses operating in these Organized Industrial Zones, there are industrial wastewater treatment plants. One of the treatment plants located in the Tekirdağ, Çorlu Organized Industrial Zone has a 30,500 ton/day capacity, and the other one 36,000 ton/day capacity and it produces 77.6 ton/day sludge. Both of it at the level of physical, biological, and chemical treatment. The treatment plant located in the Tekirdağ, Malkara Organized Industrial Zone has a 200 ton/day capacity, and it produces 0.05 ton/day sludge. It is level of biological treatment (Tekirdağ Province 2022 Environmental Status Report, 2023).

In İstanbul there are eight Organized Industrial Zones, and none of them are in Silivri (İstanbul Province 2022 Environmental Status Report, 2023).

The infrastructure data for wastewater and sanitation of the İstanbul Province is presented in Table 133.

**Table 133: The Infrastructure Data for Wastewater and Sanitation of İstanbul Province**

| The ratio of Municipal Population Provided with Wastewater Service to Total Municipal Population (%) | The ratio of the population provided with wastewater treatment services (%) | Daily wastewater generation rate per person (L/cap.day) | Rate of Population Provided with sewage service (%) | The ratio of Population with Drinking Water Network (%) | The ratio of Population Provided with Drinking Water Treatment Services (%) |
|---|---|---|---|---|---|
| 100 | 99.7 | 248 | 100 | 100 | 100 |

*Source: TURKSTAT, 2021*

The infrastructure data for wastewater and sanitation of the Tekirdağ Province is presented in Table 134.

**Table 134: The Infrastructure Data for Wastewater and Sanitation of Tekirdağ Province**

| The ratio of Municipal Population Provided with Wastewater Service to Total Municipal Population (%) | The ratio of the population provided with wastewater treatment services (%) | Daily wastewater generation rate per person (L/cap.day) | Rate of Population Provided with sewage service (%) | The ratio of Population with Drinking Water Network (%) | The ratio of Population Provided with Drinking Water Treatment Services (%) |
|---|---|---|---|---|---|
| 100 | 93 | 153 | 93 | 100 | 14 |

*Source: TURKSTAT, 2021*

### *Electricity*

Türkiye Electricity Distribution Inc. (TEDAŞ) is the state economic enterprise responsible for the distribution and retail sale of electrical energy in Türkiye. TEDAŞ consists of a central organization and a provincial organization. TEDAŞ provincial organization was privatized by dividing it into 21 regional electricity distribution companies.

For the Tekirdağ Province, the assigned supply company is Trakya Electricity Retail Sales Co. (TREPAŞ), and the distribution company is Trakya Electricity Distribution Inc. Co. (TREDAŞ).

TREPAŞ provides electricity to 1 million people and many public institutions in the Thrace Region—Tekirdağ, Edirne and Kırklareli.

According to the latest data of TURKSTAT (2021), total electricity consumption is 40,220,045 megawatt-hour (MWh), and the total electricity consumption per capita is 2539 kilowatt-hours (Kwh) in İstanbul Province.

According to the latest data of TURKSTAT (2021), total electricity consumption is 7,834,995 megawatt-hour (MWh), and the total electricity consumption per capita is 7037 kilowatt-hours (Kwh) in Tekirdağ Province.

## *Heating Source*

According to the Natural Gas Sector Report for 2022 of the Energy Market Regulatory Authority, in 2022 the national natural gas consumption amount was 53,521.06 million standard cubic meters ($Sm^3$) in Türkiye.

In 2022, 8,279.836 million $Sm^3$ of pipe gas, 65.935 million $Sm^3$ of liquefied natural gas (LNG), 0.506 million $Sm^3$ of Compressed Natural Gas (CNG), 0.380 million $Sm^3$ of Auto CNG and a total of 8,346.657 $Sm^3$ of natural gas were consumed in İstanbul.

In 2022, 1,704.750 million $Sm^3$ of pipe gas, 12,075 million $Sm^3$ of liquefied natural gas (LNG), 2,662 million $Sm^3$ of Compressed Natural Gas (CNG) and a total of 1,719.486 million $Sm^3$ of natural gas were consumed in Tekirdağ.

### *Waste Disposal*

Domestic solid wastes in Tekirdağ Province are submitted to Demirli Solid Waste Landfill Facility under Tekirdağ Metropolitan Municipality. The collection of packaging waste separately operates within the framework of the packaging waste management plan in each district in province wide. Medical wastes are collected separately through the sterilisation facility established in Süleymanpaşa District.

Number of waste treatment facilities in Tekirdağ and İstanbul Provinces as of 2023 is presented in Table 135 and Table 136.

**Table 135: Waste Management Facilities in İstanbul**

| Facility Type | Number |
|---|---|
| Class II Landfill (Municipal Waste and Non-hazardous Waste) | 2 |
| Packaging Waste Collection, Separation and Recovery Facilities | 112 |
| Packaging Waste Recycling Facilities | 158 |
| Hazardous Waste Recovery Facilities | 112 |
| Waste Oil Recovery Facility | 1 |
| Vegetable Waste Oil Recovery Facility | 3 |
| Waste Battery and Accumulator Recovery Facility | 20 |
| End-of-life Tire Recovery Facility | 2 |
| Medical Waste Sterilisation Facility | 1 |
| Non-Hazardous Waste Recovery Facility | 650 |
| Waste Electrical and Electronic Equipment Processing Facility | 24 |
| Mine Waste Disposal Facility | 0 |
| Coastal Waste Receival Facility* | 0 |
| Excavated Soil, Construction and Demolition Waste Storage/Recycling Facility | 0 |

*Source:* (İstanbul Governship, 2023)

**Table 136: Waste Management Facilities in Tekirdağ**

| Facility Type | Number |
|---|---|
| Class II Landfill (Municipal Waste and Non-hazardous Waste) | 2 |
| Packaging Waste Collection, Separation and Recovery Facilities | 120 |
| Packaging Waste Recycling Facilities | 91 |

| Facility Type | Number |
|---|---|
| Hazardous Waste Recovery Facilities | 15 |
| Waste Oil Recovery Facility | 2 |
| Vegetable Waste Oil Recovery Facility | 1 |
| Waste Battery and Accumulator Recovery Facility | 0 |
| End-of-life Tire Recovery Facility | 0 |
| Medical Waste Sterilisation Facility | 1 |
| Non-Hazardous Waste Recovery Facility | 134 |
| Waste Electrical and Electronic Equipment Processing Facility | 1 |
| Mine Waste Disposal Facility | 0 |
| Coastal Waste Receival Facility* | 0 |
| Excavated Soil, Construction and Demolition Waste Storage/Recycling Facility | 0 |

*Source:* (Tekirdağ Governship, 2023)

### *Fire Service*

According to the Laws of Municipalities, it is the duty of municipalities to establish fire organizations. Under this law, Tekirdağ Metropolitan Municipality and İstanbul Metropolitan Municipality and district municipalities has fire organizations.

According to the İstanbul Metropolitan Municipality 2023 Activity Report, there are 575 specific Fire Service trucks a total of 925 vehicles in the İstanbul Fire Authority. According to the Tekirdağ Metropolitan Municipality 2023 Activity Report, there are 1 automobile, 18 vans, 74 trucks in the Tekirdağ Fire Authority.

### *Police*

In Türkiye, internal security is carried out by the General Directorate of Security and the police force affiliated with it. There is İstanbul Provincial Police Department, Silivri District Police Department. In addition, there are gendarmerie stations affiliated to the gendarmerie general command in areas outside the jurisdiction of the police. Hence, Silivri District Gendarmerie Command is responsible from the public safety in rural areas.

There is Tekirdağ Provincial Police Department, also Çorlu, Marmaraereğlisi, Süleymanpaşa, Şarköy, Muratlı and Malkara District Police Department. In addition, there are gendarmerie stations affiliated to the gendarmerie general command in areas outside the jurisdiction of the police. In this context, the gendarmerie station commands in the Çorlu, Marmaraereğlisi, Süleymanpaşa, Şarköy and Malkara districts are:

- Çorlu District Gendarmerie Command
- Marmaraereğlisi District Gendarmerie Command
- Yeniçiftlik Gendarmerie Station Command
- Süleymanpaşa District Gendarmerie Command
- Kumbağ Gendarmerie Station Command
- Cezaevi Gendarmerie Station Command

- Şarköy District Gendarmerie Command
- Malkara District Gendarmerie Command
- Muratlı District Gendarmerie Command

### *Telecommunications*

Türk Telekom (Turkish Telecommunication Company) was established by the state to provide telecommunication services to Türkiye. It is the first integrated telecommunications operator in the country, with more than 180 years of history. It offers broadband internet, fixed telephone, mobile, and digital TV services. The provinces of Tekirdağ and İstanbul receive the same services. Besides Türk Telekom, private companies like Turkcell and Vodafone also provide telecommunication services in Türkiye.

### *Transport (incl. accidents) and Road Infrastructure (port and harbours, airport)*

**Highway**

İstanbul and Tekirdağ Provinces are affiliated with the 1st Regional Directorate of Highways, which has a coverage area of 3,982 km² and includes Sakarya, Kocaeli, Kırklareli, Tekirdağ, Yalova, Edirne, İstanbul and Çanakkale provinces within its borders. According to the website of the 1st regional directorate of the General Directorate of Highways, 2,043 km of state road, 1,147 km of provincial road, and a total of 3,982 km of road are within the region of responsibility of the 1st Regional Directorate of Highways. 82% of our road network is bituminous hot mix. The population of the region is 16,863,800. There are 99.8 m of roads and 489 people per km². The number of registered vehicles within the borders of the region is 3,500,000.

The total length of the 11 provincial roads in Tekirdağ's General Directorate of Highways records is 189 km. The total number of vehicles passing through these roads per day is 63,053. The road with the highest number of vehicles is the Çerkezköy-Veliköy road, numbered 59-04, with a length of 15 km, with 23,153 vehicles.

**Table 137: Road Network in İstanbul Province**

| Road Network by Surface Type (km) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Asphalt | | | Cobblestone (paving stone ) | Stabilize | Soil | Other Roads | Network Length |
| | Asphalt Concrete | Surface Coating | Total | | | | | |
| **State Road** | 335 | - | 335 | - | - | - | 18 | 353 |
| **Provincial Road** | 47 | - | 47 | - | - | - | 40 | 87 |
| **Total** | 382 | - | 382 | - | - | - | 58 | 440 |

*Source:* (General Directorate of Highways, 2023)

**Table 138: Road Network in Tekirdağ Province**

| Road Network by Surface Type (km) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Asphalt Roads | | | Parquet | Stabilize | Soil | Other Roads | Network Length |
| | Asphalt Concrete | Surface Coating | Total | - | - | - | - | |
| **State Road** | 342 | 25 | 367 | - | - | - | - | 367 |

| Road Network by Surface Type (km) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Provincial Road** | 157 | 32 | 189 | - | - | - | 1 | 190 |
| **Total** | 499 | 57 | 556 | - | - | - | 1 | 557 |

*Source:* (General Directorate of Highways, 2023)

**Railway**

Istanbul – Kapıkule Regional Railway is 289.69 km long, single-track, without signalisation and electrification railway line, which provides service in the Trakya region. The train which has 304 passenger capacity departs from Halkalı and passes through Çatalca, Kabakça, Silivri, Çerkezköy and provides transportation to the Velimeşe, Çorlu and Muratlı districts of Tekirdağ. As an alternative to the existing single-track railway, a 229 km long, double-track, electrified and signalled, 200 km/h new Trakya High-Speed Railway is being built, connecting Istanbul to Europe via Kapıkule. The Project consists of 3 parts, namely Halkalı Ispartakule, Ispartakule Çerkezköy and Çerkezköy-Kapıkule. The 155 km Çerkezköy-Kapıkule section of the Project will be completed with the co-financing of the European Union and Türkiye, and a total of 275 million euros of EU funds will be used. Other parts of 76 km will be constructed simultaneously by the General Directorate of Turkish State Railways (TCDD) with the national budget possibilities.

**Airway**

İstanbul Airport and Sabiha Gökçen Airport are two airports in the İstanbul Province. İstanbul Airport was put into service in 2018 and Sabiha Gökçen Airport was put into service in 2001. İstanbul Airport is located 54 km away from the city centre. Sabiha Gökçen Airport is located 45 km away from the city centre. According to the Republic of Türkiye Ministry of Transport and Infrastructure, Sabiha Gökçen Airport has 25,000,000 passenger /year capacity. İstanbul Airport has 150,000,000 passenger/year capacity. International flights are also available both from Sabiha Gökçen Airport and İstanbul Airport.

Tekirdağ Çorlu Atatürk Airport is only airport in the Tekirdağ Province. Tekirdağ Airport was put into service in 1998. Tekirdağ Çorlu Atatürk Airport is located 15 km away from the city centre. According to the Republic of Türkiye Ministry of Transport and Infrastructure, Tekirdağ Çorlu Atatürk Airport has 1,000,000 passenger/year capacity. International flights are also available from Tekirdağ Çorlu Atatürk Airport.

**Maritime Transport**

There are 3 international ports in Tekirdağ. These are Ceyport in Tekirdağ Süleymanpaşa district, Martaş port in Marmaraereğlisi district, and Asyaport, Türkiye's first transit container port (Hubport), in Tekirdağ Barbaros.

Ceyport Terminal, Logistics and Trade Inc., being a part of Cey Group and established in 2000, provides port, freight-unloading, packing, container repair-maintenance, container loading-unloading and project-based freight-unloading services in all ports of Türkiye.

Founded in 1993 in the Marmara City of Tekirdağ, the Port of MARTAŞ is located 48 miles west of Istanbul on the northern shore of the Sea of Marmara. With an annual loading and unloading capacity of 6,000,000 tons, the facility provides all the services and general warehouse management required by today's port management with the most modern equipment that can handle bulk and mixed cargo.

Asyaport is a joint venture between Global Terminal Limited (GTL), a terminal investment company of MSC, and the Turkish Soyuer family in Barbaros/Tekirdağ. Asyaport, the first Transhipment Container Terminal (Hub Port) of Türkiye, has a draft of up to 18 m, 2,000 m total quay length with a capacity of up to 2.5 million TEU.

### *Public Space and Recreation*

According to the latest data of Turkish Statistical Institute (Library and Museum Statistics, 2023), in İstanbul as of 2023 there are:

- 219 theatres with a total of 78,814 seats
- 669 cinema halls with a total of 82,578 seats
- 69 Public libraries with a total of 2,435,359 books inside
- 15 museums affiliated with the Ministry of Culture and Tourism with a total of 821,752 artifacts
- 71 private museums with a total of 181,984 artifacts
- 0 ruins

According to the Turkish Statistical Institute (Library and Museum Statistics, 2023), in Tekirdağ as of 2023 there are:

- 12 theatres with a total of 4,511 seats
- 37 cinema halls with a total of 3,571 seats
- 10 Public libraries with a total of 226,849 books inside
- 2 museums affiliated with the Ministry of Culture and Tourism with a total of 24,264 artifacts
- 0 private museum with a total of 0 artifacts
- 0 ruins

According to the İstanbul Province 2022 Year Environmental Status Report (2022), there are 83 beaches in İstanbul. There are 2 beaches in the city that has been awarded the Blue Flag. In addition, there is one inactive fish farm on the seas in the İstanbul Province. In İstanbul Province, there are 56 Natural Protected Areas. Avcıkoru Nature Park, Ayvat Bendi Nature Park, Bentler Nature Park, Büyükada Nature Park, Çilingoz Nature Park, Danamandıra Nature Park, Değirmenburnu Nature Park, Dilburnu Natural Park, Elmasburnu Natural Park, Falih Rıfkı Atay Natural Park, Fatih Çeşmesi Natural Park, Fatih Sultan Mehmet Natural Park, Göktürk Göleti Natural Park, Göztepe Natural Park, Hacetderesi Natural Park, Irmak Natural Park, Kirazlıbent Natural Park, Marmaracık Koyu Natural Park, Mehmet Akif Ersoy Natural Park, Mihrabat Natural Park, Neşetsuyu Natural Park, Türkmenbaşı Natural Park, Park Ormanı Natural Park, Polonezköy Natural Park, and Şamlar Natural Park declared by the General Directorate of Nature Conservation and National Parks.

According to the Tekirdağ Province 2022 Year Environmental Status Report (2023), there are 34 beaches in Tekirdağ. There are 6 beaches in the city that has been awarded the Blue Flag. In addition, there are no fish farm on the seas in Tekirdağ. In Tekirdağ Province, there are 6 Natural Protected Areas, Çamlıkoy Nature Park, and Kartaltepe Nature Park declared by the General Directorate of Nature Conservation and National Park.

#### 6.3.1.12.3 Neighbourhood Level

Neighbourhood data for Utilities, infrastructure, and services provided in Table 139.

**Table 139: Utilities, Infrastructure, and Services in the Neighbourhoods**

| District | Neighbourhood | Electricity | | Drinking water | | Potable water | | Irrigation water | | Sewage system | | Heating source | | Waste disposal | | Telecommunication services | | Internet | | Roads | | Health units | | School | | Mosque | | Cemetery | | Transportation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Silivri** | Değirmenköy Fevzipaşa | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN |
| | Alipaşa | Yes | IN | No | IN | Yes | S | No | - | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | IN | Yes | S |
| | Semizkumlar | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | IN | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S |
| | Çeltik | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S |
| | Yolçatı | Yes | IN | Yes | S | Yes | IN | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | IN | Yes | IN | Yes | IN |
| | Çanta Sancaktepe | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Çanta Balaban | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | IN | Yes | S |
| | Gümüşyaka | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Danamandıra | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| **Çorlu** | Seymen | Yes | IN | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S |
| | Şahbaz | Yes | S | Yes | S | Yes | S | Yes | IN | No | - | Yes | IN | Yes | S | Yes | IN | Yes | IN | Yes | IN | No | IN | No | - | Yes | S | Yes | S | Yes | S |
| | Türkgücü | Yes | IN | Yes | IN | Yes | S | No | - | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Yenice | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | IN | Yes | IN |
| | Maksutlu | Yes | S | Yes | S | Yes | S | No | - | No | - | No | IN | Yes | S | No | - | No | - | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S |
| **Marmaraereğlisi** | Türkmenli | Yes | S | Yes | S | Yes | S | Yes | IN | No | IN | Yes | IN | Yes | S | Yes | IN | Yes | IN | Yes | S | No | S | No | IN | Yes | S | Yes | S | Yes | S |
| | Yakuplu | Yes | S | Yes | S | Yes | S | No | - | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | No | IN | Yes | S | Yes | IN | Yes | S |
| | Çeşmeli | Yes | IN | Yes | S | Yes | S | No | - | No | IN | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| **Süleymanpaşa** | Aydoğdu | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Karaevli | Yes | S | Yes | S | Yes | S | No | - | No | - | No | - | Yes | S | Yes | S | Yes | IN | Yes | IN | No | - | Yes | S | Yes | - | Yes | - | Yes | - |
| | Gazioğlu | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | v | Yes | S | Yes | IN |
| | Köseilyas | Yes | S | Yes | IN | Yes | IN | No | - | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | IN | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | IN |
| | Husunlu | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN z | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S |
| | Çiftlikönü (Gündoğdu) | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN |
| | İstiklal (Eskicami) | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | No | - | No | - | No | - | No | - | Yes | IN |
| | Karahisarlı | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | IN | No | - | No | - | Yes | IN | Yes | IN | Yes | IN |
| | Kayı | Yes | S | Yes | S | Yes | S | Yes | IN | No | - | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | No | - | Yes | S | Yes | S | Yes | S | Yes | IN |
| | Yağcı | Yes | S | Yes | IN | Yes | S | No | - | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Zafer | Yes | IN | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Osmanlı | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Seymenli | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |
| | Güveçli | Yes | S | Yes | IN | Yes | IN | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S |
| | Nusratfakı | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S |
| | İnecik | Yes | S | Yes | IN | Yes | IN | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S |

| District | Neighbourhood | Electricity | | Drinking water | | Potable water | | Irrigation water | | Sewage system | | Heating source | | Waste disposal | | Telecommunication services | | Internet | | Roads | | Health units | | School | | Mosque | | Cemetery | | Transportation | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nusratlı | Yes | S | Yes | S | Yes | S | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S | Yes | IN | No | - | No | - | Yes | S | Yes | S | Yes | IN |
| | Mahramlı | Yes | S | Yes | S | Yes | S | No | - | No | - | Yes | IN | Yes | S | Yes | S | Yes | IN | Yes | S | No | - | No | - | Yes | S | Yes | S | No | - |
| | Kınıklar | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S |
| **Malkara** | Dereköy | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | S | Yes | S | Yes | IN | Yes | IN | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S |
| | Yenice | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | S |
| | Hereke | Yes | S | Yes | IN | Yes | IN | Yes | - | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | No | - | No | - | Yes | S | Yes | S | Yes | IN |
| | Ahievren | Yes | IN | Yes | S | Yes | S | Yes | IN | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | S | Yes | S |
| **Şarköy** | Tepeköy | Yes | IN | Yes | S | Yes | S | No | - | Yes | S | Yes | S | Yes | S | No | - | Yes | S | Yes | IN | No | - | No | - | Yes | S | Yes | S | Yes | S |
| **Muratlı** | Yukarısırt | Yes | IN | Yes | IN | Yes | IN | No | - | No | - | Yes | IN | Yes | IN | Yes | S | Yes | IN | Yes | IN | No | - | No | - | Yes | IN | Yes | S | No | - |

*S: Sufficient; IN: Insufficient

The problems experienced by the neighbourhoods were questioned during the social field study. The answers of the Mukhtars are presented in Table 140.

Most neighbourhoods experience environmental and economic problems. While social and health problems are prominent for some others, mostly no chronic illnesses are seen in the settlements. When asked whether there has been an increase in crime rates in the last five years, robbery and drug addiction were mentioned in certain settlements.

**Table 140: Problems Faced in the Neighbourhoods**

| District | Neighbourhood | Environmental | Economic | Social | Health | Criminal |
|---|---|---|---|---|---|---|
| **Silivri** | Değirmenköy Fevzipaşa | Yes | No | No | No | None |
| | Alipaşa | Yes | No | No | No | None |
| | Semizkumlar | No | No | No | No | None |
| | Çeltik | Yes | Yes | No | Yes | None |
| | Yolçatı | Yes | Yes | Yes | Yes | None |
| | Çanta Sancaktepe | No | Yes | No | No | Drug addiction |
| | Çanta Balaban | Yes | No | No | No | Drug addiction |
| | Gümüşyaka | Yes | Yes | Yes | Yes | Robbery |
| | Danamandıra | Yes | Yes | No | No | None |
| **Çorlu** | Seymen | No | No | No | No | None |
| | Şahbaz | No | Yes | Yes | No | None |
| | Türkgücü | Yes | No | No | No | None |
| | Yenice | Yes | Yes | No | No | Drug addiction |
| | Maksutlu | Yes | Yes | No | No | None |
| **Marmaraereğlisi** | Türkmenli | No | Yes | Yes | Yes | Robbery |
| | Yakuplu | No | No | No | No | None |
| | Çeşmeli | No | No | No | No | None |
| **Süleymanpaşa** | Aydoğdu | Yes | No | Yes | No | Drug addiction and sex trafficking |
| | Karaevli | No | Yes | No | No | None |
| | Gazioğlu | No | No | No | No | None |
| | Köseilyas | No | Yes | No | No | Robbery |
| | Husunlu | No | Yes | Yes | No | Robbery |
| | Çiftlikönü (Gündoğdu) | No | No | No | No | None |

| District | Neighbourhood | Environmental | Economic | Social | Health | Criminal |
|---|---|---|---|---|---|---|
| | İstiklal (Eskicami) | No | No | No | No | None |
| | Karahisarlı | No | Yes | No | No | None |
| | Kayı | Yes | No | No | No | None |
| | Yağcı | Yes | Yes | No | No | Robbery |
| | Zafer | No | No | No | No | Drug addiction |
| | Osmanlı | No | No | No | No | None |
| | Seymenli | No | No | No | No | None |
| | Güveçli | No | Yes | No | No | None |
| | Nusratfakı | Yes | No | Yes | No | Robbery |
| | İnecik | No | No | No | No | Robbery |
| | Nusratlı | No | Yes | Yes | Yes | None |
| | Mahramlı | Yes | No | Yes | No | None |
| | Kınıklar | No | No | No | No | None |
| **Malkara** | Dereköy | No | No | No | No | None |
| | Yenice | No | Yes | Yes | No | None |
| | Hereke | No | No | No | No | None |
| | Ahievren | No | Yes | Yes | No | None |
| **Şarköy** | Tepeköy | Yes | Yes | Yes | Yes | None |
| **Muratlı** | Yukarısırt | No | No | Yes | Yes | None |

Moreover, whether there have been conflicts among the residents of the settlements in the last five years was asked of Mukhtars. The answers and reasons to the conflicts in the neighbourhoods are presented in Table 141.

**Table 141: Conflicts Occurred in the Neighbourhoods**

| District | Neighbourhood | Grazing | River | Forest | Well water | Land | Economic | Among residents | Solution |
|---|---|---|---|---|---|---|---|---|---|
| **Silivri** | Değirmenköy Fevzipaşa | No | No | No | No | No | Yes | Yes | - |
| | Alipaşa | No | No | No | No | No | No | No | - |
| | Semizkumlar | | | | | | | | |
| | Çeltik | Yes | No | No | No | No | No | Yes | Court |
| | Yolçatı | Yes | Yes | No | No | No | No | Yes | - |
| | Çanta Sancaktepe | No | No | No | No | No | No | Yes | Court |

| District | Neighbourhood | Grazing | River | Forest | Well water | Land | Economic | Among residents | Solution |
|---|---|---|---|---|---|---|---|---|---|
| | Çanta Balaban | No | No | No | No | No | No | No | - |
| | Gümüşyaka | No | No | No | No | No | No | Yes | Court |
| | Danamandıra | No | No | No | No | No | No | No | - |
| **Çorlu** | Seymen | Yes | No | No | No | No | No | No | Not solved |
| | Şahbaz | No | No | No | No | No | No | No | - |
| | Türkgücü | No | No | No | No | No | No | No | - |
| | Yenice | No | No | No | No | No | No | No | - |
| | Maksutlu | No | No | No | No | Yes | No | No | - |
| **Marmaraereğlisi** | Türkmenli | No | No | No | No | No | Yes | No | - |
| | Yakuplu | Yes | No | No | No | No | No | No | - |
| | Çeşmeli | No | No | No | No | No | No | No | - |
| **Süleymanpaşa** | Aydoğdu | No | No | No | No | No | No | Yes (ethnicity) | |
| | Karaevli | No | No | No | No | No | No | No | - |
| | Gazioğlu | No | No | No | No | No | No | No | - |
| | Köseilyas | No | No | No | No | No | No | No | - |
| | Husunlu | No | No | No | No | No | No | No | - |
| | Çiftlikönü (Gündoğdu) | No | No | No | No | No | No | No | - |
| | İstiklal (Eskicami) | No | No | No | No | No | No | No | - |
| | Karahisarlı | No | No | No | No | No | No | No | - |
| | Kayı | Yes | No | No | Yes | Yes | No | Yes | Reconciliation (Mukhtar) |
| | Yağcı | No | No | No | No | No | No | No | - |
| | Zafer | No | No | No | No | No | No | Yes (ethnicity) | - |
| | Osmanlı | No | No | No | No | No | No | No | - |
| | Seymenli | No | No | No | No | No | No | No | - |
| | Güveçli | No | No | No | No | No | No | No | - |
| | Nusratfakı | No | No | No | No | No | No | Yes | Reconciliation (Mukhtar) |
| | İnecik | No | No | No | No | No | No | Yes | Reconciliation (Mukhtar) |

| District | Neighbourhood | Grazing | River | Forest | Well water | Land | Economic | Among residents | Solution |
|---|---|---|---|---|---|---|---|---|---|
| | Nusratlı | No | No | No | No | No | No | No | - |
| | Mahramlı | No | No | No | No | Yes | Yes | No | Reconciliation (Mukhtar) and gendarmerie |
| | Kınıklar | No | No | No | No | Yes | No | No | Reconciliation (Mukhtar) |
| **Malkara** | Dereköy | No | No | No | No | No | No | No | - |
| | Yenice | No | No | No | No | Yes | No | No | Reconciliation (Mukhtar) |
| | Hereke | No | No | No | No | No | Yes | No | - |
| | Ahievren | No | No | No | No | No | No | No | - |
| **Şarköy** | Tepeköy | No | No | No | No | Yes | No | Yes | Reconciliation (Mukhtar) |
| **Muratlı** | Yukarısırt | No | No | No | No | No | No | Yes | - |

### 6.3.2 Cultural Heritage Baseline

Tangible and intangible cultural assets in the AoI were identified through desk and field investigations. The cultural heritage baseline study aims to report on the immovable cultural and archaeological assets identified along the Project's planned route and impact area, define their limits of expansion, assess the potential impacts of construction works on these assets and provide recommendations for mitigation measures. National legislation (laws and regulations) and relevant international standards were closely followed during the study.

The main objectives of the archaeological investigation and other possible activities that may need to be completed before the commencement of construction activities are as follows:

- To assess the potential and characteristics of cultural assets in specific locations prior to the start of construction, and develop plans and design strategies to prevent construction damage to these sites in the Project Area,
- To provide data on the potential sites identified for inclusion in reports for proper planning of Project construction (including the Project schedule) to avoid delays in the Project construction activities,
- To develop strategies following the legal procedures and propose changes (if necessary) in the orientation/transposition of associated facilities in areas of high archaeological value. To propose further actions to be taken where re-orientation/transposition of associated facilities is not possible,
- To collect and record archaeological data scattered throughout the construction area using the of scientific methods described below, and to facilitate the transportation of movable cultural heritage items to the relevant museums,
- To archive all data gathered on archaeological sites and to prepare identification and registration labels of archaeological assets to be reported to the Ministry of Culture and Tourism of the Republic of Türkiye, and
- To enrich the cultural and archaeological inventory of Türkiye with the approved new archaeological finds and features.

#### *6.3.2.1 Area of Influence*

All areas where significant impacts are likely to occur are included in the AoI, and project components and associated facilities are also considered when determining the AoI. The AoI for the cultural heritage component is defined as follows:

| ESIA Component | AoI |
|---|---|
| Cultural Heritage | AoI includes all the Project components and associated facilities. Designed as a 250 m buffer (on both sides -total 500 m) around the motorway route, project components and associated facilities. |

### 6.3.2.2 Methodology

#### 6.3.2.2.1 Regulatory Requirements

##### *Tangible Cultural Heritage*

In Türkiye, the movable and immovable cultural and natural assets are protected and preserved by the "Law on the Preservation of Cultural and Natural Assets" No.2863 (Adopted on 21.07.1983, published in the Official Gazette dated 23.07.1983 and numbered 18113) as amended by Law No.3386.[155] According to the Law, the main assets which are identified as cultural and natural heritage under legal protection are identified as follows:

- Natural and immovable cultural assets of the 19th century and before,
- Any immovable cultural asset built after the end of the 19th Century and categorized as an "important asset to be protected" by the Ministry of Culture and Tourism,
- Immovable cultural assets located within the Protected Areas (in the Law, Protected Area are defined as ancient sites and city ruins that reflect the main social, economic or architectural characteristics of their era. Protected Areas may also be locations where fundamental historical events took place or areas where significant natural or cultural assets with natural and cultural characteristics that need to be protected),
- Structures, buildings, or places that have witnessed significant historical events during the Turkish Independence War or the establishment of the Turkish Republic, regardless of time and registration; and
- All dwellings and buildings that have been used by Mustafa Kemal ATATÜRK regardless of the time of construction or registration.

Within the scope of this Law, the Ministry of Culture and Tourism and its local branches (Cultural and Natural Assets Preservation Boards, Museums) are responsible for taking decisions at the national level and providing the necessary legal actions to protect cultural and natural assets listed above. At the local level, Regional Boards for the Preservation of Cultural and Natural Assets is responsible to register and classify the cultural and natural heritage, inspecting and taking decisions on land use and construction works related to highway projects which can affect these assets. Declaration of site protection, covering discovered cultural heritage located in their area of authorization, is also under the responsibility of the Regional Boards whose decisions may also directly affect the Project.

According to Law on Preservation of Cultural and Natural Assets No.2863, all natural and cultural assets that meet the legal protection conditions are the property of the State. Therefore, Regional Boards have the power and the authority to ensure legal protection and conservation of relevant sites and to approve or reject all activities which have the potential for negative impact on these sites such as construction, destruction, road blockage and excavation. Currently, the İstanbul Regional Board for the Preservation of Cultural and Natural Asset No.1 and Edirne Regional Board for Preservation of Cultural and Natural Assets are the responsible boards for the Project Area.

Apart from the Law No.2863 on the Preservation of Cultural and Natural Assets, which regulates the procedures for the protection and conservation of cultural and natural assets, there are some additional regulations. First of these is the Principal Decision of the Ministry of Culture and Tourism of Türkiye named "Protection and Use Conditions of

[155] https://www.mevzuat.gov.tr/MevzuatMetin/1.5.2863.doc

Archaeological Sites" (No. 658, issued 5 November 1999).[156] This decision states that all archaeological sites need to be classified and protected according to their significant features. Three main categories are determined as relevant to archaeological sites:

- 1st Degree Archaeological Sites
- 2nd Degree Archaeological Sites
- 3rd Degree Archaeological sites.

Principle Decision No: 658 defines these sites as follows:

**1st Degree Archaeological Sites:** Areas requiring the highest level of protection. Any alteration of these sites is prohibited except for the purpose of scientific research, archaeological excavations and conservation of the site. The area should be free of any type of building and construction. All kinds of construction, excavation, and modification activities are prohibited. However, for exceptional cases such as the necessity for infrastructure construction, Regional Preservation Boards may permit such activities based on the approval of the relevant museum and the head of the scientific excavation team.

**2nd Degree Archaeological Sites:** Areas requiring a medium level of protection. They should be preserved based on the conditions of protection and utilization set by the Regional Preservation Boards. Additional construction is prohibited. As for the 1st degree archaeological sites, for exceptional cases such as the necessity for infrastructure construction, Regional Preservation Boards may permit such activities based on the approval of the relevant museum and the head of the scientific excavation team.

**3rd Degree Archaeological Sites:** Lowest level protection area. In light of the protection and utilization decisions, new arrangements can be permitted in these archaeological areas. Construction is permitted based on the decisions of Regional Preservation Boards. Before applying for a construction permit, test pit excavations should be conducted and the outcomes of these excavations should be reviewed by the relevant museum and, if present, the head of the scientific excavation team. Reviews should be submitted to Regional Preservation Boards. The Boards may ask for an extension of the areal test pit coverage before taking any decision.

Furthermore, "Implementation Guidelines for Field Surveys, Test Pits and Excavation Works on Cultural and Natural Assets" of the Ministry of Culture and Tourism of Türkiye with the approval number 94949537-160.99-51264, dated 13/03/2013[157] define the procedures for salvage excavations, archaeological test pits, and other studies that might be required.

In addition to the regulations mentioned above, the following guidelines were taken into consideration during the study:

(i) International Finance Corporation-IFC, Performance Standard 8

(ii) Department for Transport UK, Design Manual for Roads and Bridges Part 2 HA 208/07 Cultural Heritage

(iii) The World Bank, ESS8: Cultural Heritage, First Edition Published June 2018

[156] https://kvmgm.ktb.gov.tr/TR-44310/ilke-karari--karar-no-658--karar-tarihi-05111999.html

[157] https://teftis.ktb.gov.tr/TR-50815/kultur-ve-tabiat-varliklariyla-ilgili-yapilacak-yuzey-a-.html

(iv) International Council on Monuments and Sites (ICOMOS).

### *Intangible Cultural Heritage*

The United Nations Educational, Scientific and Cultural Organization (UNESCO) had accepted the “Convention for the Safeguarding of the Intangible Cultural Heritage” in 2003. Türkiye had become party to the Convention in 2006.

According to the Article 2 of the Convention:

- The “intangible cultural heritage” means the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity. For the purposes of this Convention, consideration will be given solely to such intangible cultural heritage as is compatible with existing international human rights instruments, as well as with the requirements of mutual respect among communities, groups and individuals, and of sustainable development.[158].

Buildings, historic places, monuments, and artefacts are cultural property. Intangible heritage consists of nonphysical intellectual wealth, such as folklore, customs, beliefs, traditions, knowledge, and language. In 2001, UNESCO organized a survey among States and NGOs to try to agree on a definition, and the Convention for the Safeguarding of the Intangible Cultural Heritage was drafted in 2003 for its protection and promotion. Türkiye became a party to the Convention in 2006.

Within the Convention the “intangible cultural heritage” is manifested inter alia in the following domains:

(a) oral traditions and expressions, including language as a vehicle of the intangible cultural heritage (myths, epics, legends, folk tales, riddles, poems, lullabies etc.),

(b) performing arts (traditional theatre, puppets, folk dance, folk music etc.),

(c) social practices, rituals and festive events (birth, circumcision, farewells to military, weddings, anniversaries, Hıdrellez, The Navruz, Sema, Semah, etc.),

(d) knowledge and practices concerning nature and the universe (folk meteorology, traditional cuisines etc.),

(e) traditional craftsmanship (pottery, wood carving, filigree, paper marbling etc),[159]

Türkiye is a party to the UNESCO Convention on Intangible Cultural Heritage.

#### 6.3.2.2.2 Methodological approach

The studies were carried out with the participation of expert archaeologists of HERMES Environmental, Social and Archaeology Consultancy Services (herein after called as Hermes). The names of the archaeologists who conducted the study and contributed to the report are presented in Table 142.

[158] Basic Texts of the 2003 Convention for the Safeguarding of the Intangible Cultural Heritage, 2018

[159] Convention for the Safeguarding of the Intangible Cultural Heritage, Article 2.2.

**Table 142: Expert Team Table Performing the Study**

| Name | Title | Duty |
|---|---|---|
| **Engin ÇOŞAR** | Senior Archaeologist | Field Coordinator,<br>Field Studies, Reporting |
| **Erkan ATAY** | Senior Archaeologist | Reporting, Support |
| **Gözde ERGÜL** | Archaeologist | Reporting, Support |

The research methodology used by the experts, in general, is composed of three consecutive parts that could be listed as:

f) Desktop Study,

g) Detailed surface survey,

h) Reporting

The archaeological findings that are highly likely to be encountered during a field survey could be listed below[160][161]:

- Flat settlements,
- Flat ground settlements,
- Hilltop settlements,
- Mounds,
- Chapel,
- Cemeteries (Late Ottoman, Early Republican),
- Monumental Tombs,
- Necropolises,
- Sanctuaries,
- Modern Cemeteries,
- Lookout Towers,
- Forts,

[160] https://www.oxfordreference.com/display/10.1093/acref/9780199534043.001.0001/acref-9780199534043?btog=chap&hide=true&pageSize=20&skipEditions=true&sort=titlesort&source=%2F10.1093%2Facref%2F9780199534043.001.0001%2Facref-9780199534043

[161] https://dictionary.cambridge.org/dictionary/

- Aqueducts,
- Ancient Bridges,
- Ancient roads and culverts,
- Areas of Archaeological Potential etc.

The archaeological evaluation method of a determined area is made according to the table below.

**Table 143: Archaeological Evaluation Method Table**

| Site | Type of the Surface Material | Intensity Rate of the Surface Material |
|---|---|---|
| **Registered Sites** | Sites that are registered and protected by Law No. 2863. | |
| **Non-registered Sites** | Sites that are cultural assets but non-registered | |
| **Sites in the Process of Registration** | Sites that are in the process of registration as per Law No. 2863. | |
| **Potential Archaeological Sites** | Ceramic, roof tile, architectural stone block, glass object shards, stone object shards, metal object shards, bone etc. | Between 1-10 pieces (Low Intensity) |
| **Archaeological Sites** | Ceramic, roof tile, architectural stone block, glass object shards, stone object shards, metal object shards, bone etc. | Between 10-100 pieces (High Intensity) |
| | Architectural remains, etc. | 1 tumulus, 1 wall, 1 cistern etc. |
| **Other Sites** | Sites which include the remains of the bridge, bastion, blockhouse, fountain, entrenchment, grave/cemetery, etc. | |

**Desktop Studies**

The provinces of İstanbul and Tekirdağ, where the Project Site is located and inspections were made, is among the regions with high archaeological risk zones. With its climate, trade connections, connection with the sea and harbours, the region presents many advantageous characteristics for the past societies. These factors have triggered continuous habituation within the region since antiquity. Nowadays, field inspections and registration work in the region are ongoing under the authority of the staff of the Ministry of Culture and Tourism.

There is still a need for updated field surveys considering the numerous cultures that have dominated the region antiquity together with the continuous shifts of its streams. This was followed by a review of scientific publications,

documents, archives of Regional Conservation Boards, Museums and the Ministry of Culture and Tourism to obtain a holistic picture of the archaeological potential of the impact area.

Firstly, data on provinces, districts, and cities/villages within the Project Site scope was thoroughly collected. All publications on previous archaeological works conducted in the relevant geographical regions and data on archaeological sites located in the vicinity of the Project Site and impact area were studied.

Resources that were used during the desk study:

- Academic publications about archaeological sites around the Project Site and its surroundings,
- Historical maps,
- Reports on previous Cultural Heritage Works and Field Survey Results,
- Inventory Archives of the Ministry of Culture and Tourism.

The main resources used for the desktop study is listed below. All resources are detailed in Chapter 12: References.

- Guidance on Heritage Impact Assessments for Cultural World Heritage Properties, A publication of the International Council on Monuments and Sites January 2011[162]
- Statistics of Immovable Cultural Properties to Be Preserved by Provinces, Ministry of Culture and Tourism, Directorate General of Cultural Assets and Museums[163]
- Ministry of Culture and Tourism, High Council for the Conservation of Cultural and Natural Assets, Principle Decision on Archaeological Sites, *'Archaeological Sites, Conservation and Utilization Conditions'*, Decision No: 658, Date: 05.11.1999[164]
- UNESCO Turkey National Commission, UNESCO Intangible Cultural Heritage Lists[165]
- UNESCO, Historic Areas of Istanbul[166]
- Web pages:
  - https://kulturenvanteri.com/yer
  - https://www.malkara.bel.tr
  - https://www.marmaraereglisi.bel.tr
  - https://www.silivri.bel.tr
  - https://www.suleymanpasa.bel.tr/kategori/festivaller

[162] https://www.iccrom.org/sites/default/files/2018-07/icomos_guidance_on_heritage_impact_assessments_for_cultural_world_heritage_properties.pdf

[163] https://kvmgm.ktb.gov.tr/TR-284336/illere-gore-korunmasi-gerekli-tasinmaz-kultur-varligi-istatistigi.html

[164] https://kvmgm.ktb.gov.tr/TR-44310/ilke-karari--karar-no-658--karar-tarihi-05111999.html

[165] https://www.unesco.org.tr/Pages/126/123/UNESCO-%C4%B0nsanl%C4%B1%C4%9F%C4%B1n-Somut-Olmayan-K%C3%BClt%C3%BCrel-Miras%C4%B1-Temsil%C3%AE-Listesi

[166] https://whc.unesco.org/en/list/356/

- https://trakyaotoblog.com/trakya-festivalleri/
- https://www.trakyanet.com/trakya
- http://www.tekirdag.gov.tr

Additionally, all archaeological sites have been defined during this desk study phase with the help of topographical maps and satellite imagery.

As a result of the fieldwork of Hermes and desk studies, the document formats for collecting data were designed as “Impact Assessment Form” and “Archaeological Status Table”. Impact Assessment Forms include all needed data for the GIS database.

As a result of the research conducted on the website of the Ministry of Culture and Tourism numbers related to immovable cultural assets were found and listed in Table 144.

**Table 144: Statistics of Immovable Cultural Assets in Need of Protection, End of 2021**

| IMMOVABLE CULTURAL ASSETS | Amount | |
|---|---|---|
| | İstanbul | Tekirdağ |
| Streets under Protection | 12 | - |
| Monuments | 81 | 9 |
| Governmental Buildings | 566 | 34 |
| Cultural Buildings | 2,382 | 142 |
| Martyrdoms | 10 | 3 |
| Military Buildings | 123 | 20 |
| Industrial or Trading Buildings | 580 | 44 |
| Religious Buildings | 1,339 | 62 |
| Cemeteries | 810 | 55 |
| Examples of Civil Architecture | 25,396 | 509 |
| Remains | 769 | 31 |
| TOTAL | 32,068 | 909 |

***Source:*** *https://kvmgm.ktb.gov.tr/TR-284336/illere-gore-korunmasi-gerekli-tasinmaz-kultur-varligi-istatistigi.html*

**Detailed Surface Surveys**

The main principle of these activities was constituted by the on-site investigation of all archaeological areas, including the already known, and surveying along with all the Project Site senior archaeologists.

In the detailed surface surveys, the route was inspected in July 2022, and the areas with associated facilities such as quarries and camp (accommodation) sites were visited in November 2022.

Due to the changes and additions of new associated facilities, additional investigations were realized within the borders of the Silivri District of the Istanbul Province and Marmaraereğlisi, Çorlu, Süleymanpaşa, Malkara and

Şarköy districts of the Tekirdağ Province between 23.01.2023 and 29.01.2023. These two different studies were conducted on different dates and with different characteristics, so the results are presented in a way to avoid overlapping information in separate sub-headings (Chapters 6.3.2.3.2 and 6.3.2.3.3).

Extensive field walking was used as the principal methodology for the identification of movable and immovable archaeological and cultural assets along the Project Site during the surveys. Areas with low or impossible chances of access (rice fields, dense vegetation, high altitude over 2500 m) were surveyed through satellite imagery and 1/25,000 scaled maps. Additionally, those areas were studied through the use of ancient sources and field surveys/excavations that had been previously conducted.

The following activities were carried out within the scope of intensive surveys: determination of the ties of the Project Site with the archaeological areas, identification of the spatial extension of the archaeological features by observing the surface findings, observing the locations where surface findings were concentrated, and identification of sections where the Project Site intercepts the concentration areas.

Coordinates of all discoveries presented in Appendix F-Cultural Heritage Findings. The maps showing the locations of cultural heritage findings are also presented in Appendix I.

During all investigations in the Project Site, only archaeological objects visible on the surface were monitored.

During the site walking, all findings (architectural remains or traces, graves or traces of graves, mounds, tumuli, etc.), were recorded on Field Survey Forms and additionally were included in the daily fieldwork reports.

The Project Site was taken as the centre of the field research, including its immediate surroundings.

**Reporting**

As a result of the fieldwork the relevant sections of the ESIA was developed with all archaeological movable/immovable cultural assets that were discovered.

All computational data on the forms were prepared through the preference of one of the UTM ED50 and WGS systems. Furthermore, all computational data (such as kmz/kml) related to discovered areas were also prepared.

The interrelations between the discovered archaeological sites and the Project Site were studied. Identified interrelations are presented in the ESIA together with their degree of importance, impact, and sensitivity. The mitigation measures to be followed for minimizing the effects of construction activities are also presented in the impact assessment chapter (Chapter 7.3.2).

### *6.3.2.3 Baseline Findings*

#### 6.3.2.3.1 Historical Geography of the Region

**İstanbul Province**

Strategically located on the Bosphorus peninsula between the Balkans and Anatolia, the Black Sea and the Mediterranean, Istanbul was successively the capital of the Eastern Roman Empire, and the Ottoman Empire and has been associated with major events in political history, religious history, and art history for more than 2,000 years. The city is situated on a peninsula which is surrounded by the Golden Horn (Haliç), a natural harbor on the north, the Bosphorus on the east and the Marmara Sea on the south. The Historic Peninsula, on which ancient Byzantium and Constantinople developed, was surrounded by ancient walls first built by Theodosius in the early fifth century.

The Outstanding Universal Value of Istanbul lies in its unique integration of architectural masterpieces that reflect the meeting of Europe and Asia over many centuries, and its unique skyline formed by the creative genius of Byzantine and Ottoman architects.

The distinctive and characteristic skyline of Istanbul was built up over many centuries and encompasses the Hagia Sophia whose vast dome reflects the architectural and decorative expertise of the 6th century, the 15th century Fatih complex and Topkapı Palace - that was continually extended until the 19th century, the Süleymaniye Mosque complex and Şehzade Mosque complex, works of the chief architect Sinan, reflecting the climax of Ottoman architecture in the 16th century, the 17th century Blue Mosque and the slender minarets of the New Mosque near the port completed in 1664.

The four areas of the property are the Archaeological Park, at the tip of the Historic peninsula; the Süleymaniye quarter with Süleymaniye Mosque complex, bazaars, and vernacular settlement around it; the Zeyrek area of settlement around the Zeyrek Mosque (the former church of the Pantocrator), and the area along both sides of the Theodosian land walls including remains of the former Blachernae Palace. These areas display architectural achievements of successive imperial periods also including the 17th century Blue Mosque, the Sokollu Mehmet Pasha Mosque, the 16th century Şehzade Mosque complex, the 15th century Topkapı Palace, the hippodrome of Constantine, the aqueduct of Valens, the Justinian churches of Hagia Sophia, St. Irene, Küçük Ayasofya Mosque (the former church of the St. Sergius and Bacchus), the Pantocrator Monastery founded under John II Comnene by Empress Irene; the former Church of the Holy Saviour of Chora with its mosaics and paintings dating from the 14th and 15th centuries; and many other exceptional examples of various building types including baths, cisterns, and tombs[167].

***Silivri District***

Silivri is located at the shore of the Sea of Marmara, at a distance of 67 km towards the west of İstanbul. Büyük Çekmece is located in the east, Çatalca in the north, Çorlu and Marmara Ereğilisi districts in the west, and the Marmara Sea covers the entire southern border.[168]

History of Silivri: The city was known in antiquity by different names such as Selymbria or Selybria. It had been an important centre of power throughout the whole of antiquity thanks to its natural harbour and location on important trading routes. Silivri is located at the shore of the Sea of Marmara (Propontis in antiquity) between the centres of İstanbul (Byzantion) and Marmara Ereğlisi (Perintos).

The adjunct "bria" at the end of the ancient name of Selymbria is equivalent to the Greek word "polis" (city). This information is indicative that the region was home to Thracian tribes possibly as back as 1200 BC. Strabo is clear that the city was established by a legendary founder names Selis and explains why the city was named the Selybria (= City of Selys).

The city was colonized by the Doric settlement of Megara between 750-550 BC during the colonial movement of mainland Greeks. During the Archaic Period, the city was known to be under Persian domination. This era was followed by the Classical Period during which not just Selymbria but also the whole of Thrace was devastated first by the so-called Persian Wars and later by the Peloponnesian War.

[167] https://whc.unesco.org/en/list/356/

[168] https://www.silivri.bel.tr/sayfa/silivri_cografyasi/73

The region around Selymbria was subject to certain military expeditions following the unsuccessful invasion of Greece by the Persians. These expeditions aimed at freeing the region from the Persian domination and were commanded by Cimon, the famed Athenian general. As a result of the Cimons expedition, the whole littoral of Thrace was freed from the Persian domination by 475 BC. Tax lists indicate that Selymbria was a member of the Attic-Delian Sea League starting from 451-450 BC. However soon Selymbria left the League to be a subject of the city of Byzantion in the west.

Selymbria continued its existence as a modest port city throughout the Roman period. Later in the Late Antiquity, Constantinus I (306-337 AD) formed the Eastern Roman Empire. The governmental seat was removed from Nicomedia to Byzantion. The name of the latter was changed to Constantinopolis by 330 AD and became the capital of the Empire. Following this Selymbria became a Byzantine settlement continuing its life as so until its conquest by the Turks.[169]

The Germiyan Church: The church was built in 1896. It was turned into a mosque following the exchange. The building was transformed into a school in 1948 after a new mosque was built within the village. In 1960 a huge landslide triggered the transportation of the whole population of the village. This event, in the end, caused the structure to be abandoned and damaged due to neglect. The building was registered in 1995. [170]

The Çantuğa Church: The building is thought to be built during the 19th century. Nowadays the building is devoid of its whole upper structure. Archival research by the Ministry of Culture states that the building was also known as the Şaraphane Church [The Winery Church] (Papazın Kilisesi) or is instead a khan known by the name "Deveciler Hanı [Khan of Camel Riders]". The building lies abandoned today devoid of its real function. [171]

Historical Old Mosque of Selimpaşa: Though its exact date of construction is not known, the building is known to exist at least since 1796. According to the records the building was destroyed during a fire that happened in 1817. A year later in 1818, it was repaired with the funding of the Prince of Bogdan (Moldovia). Later in 1820, the building was rebuilt at its original location with the funding collected from the Greek community at İstanbul and Epivates (Bigados).

**Tekirdağ Province**

Tekirdağ is among the three provinces of Türkiye which lie completely in Europe. The city is located towards the northeast of the Sea of Marmara in a relatively flat region that is rich in alluvial soils.[172] Known throughout its past first as Bisanthe (5th century BC) and later as Rhaedestus (343 BC - 843 AD), Rodosto (843-1358 AD), Rodosçuk (after the Ottoman Conquest at 1358), Tekfurdağı (1732) the region was finally named as Tekirdağ following the establishment of the Republic.

Tekirdağ has nearly 6000 years of settlement history. It had always been an urban centre of attraction throughout its past due to its fertile lands and strategic location between Anatolia and the Balkans.

The Güngörmez and Güneşkaya caves from the District of Şarköy together with Toptepe Höyük from the Marmara Ereğlisi supply us with information on the Chalcolithic Period. Surveys along the littoral of the region had shown the

[169] https://www.silivri.bel.tr/sayfa/silivri_tarihi/263

[170] https://kulturenvanteri.com/yer/germiyan-rum-kilisesi/#16/41.131729/28.029606

[171] https://kulturenvanteri.com/yer/silivri-cantuga-kilisesi/#16/41.059284/28.088425

[172] http://www.tekirdag.gov.tr/cografi-durumu

whole seafront was densely settled during the Early Bronze Age. Migrations in great amounts dominated the history of the region throughout the Middle and Late Bronze Ages.

Thrace became an important trade stop following its colonization by the Greeks within the 7th century BC. Many cities were known to be established along the Thracian littoral during this century. The region went under Persian domination around 514-513 BC following the Scythian Campaign of Darius the Great. The Persian domination of Thrace ended in 478-477 BC with the cleansing of the region from Persians by the forces of the Attic-Delian League. Among many Thracian tribes, the Odrysian Kingdom dominated the region following its freeing from the Persians. However, Thrace went under Macedonian power after its conquest in 342 BC by Macedonian king Philip II, who subjected the Odrysian Kingdom to his rule. Thracians were known to follow Alexander the Great in his Eastern Campaign, be of great use there and return to their homeland with extreme riches. Following the death of Alexander the Great Thrace fall under the rule of Lysimachus, one of the diadochi.

Roman Emperor Tiberius' sending of a governor to Thrace was the first signal of Roman interest in the region. Later in 46 AD, this interest gained officiality by the establishment of a Province in Thrace by Emperor Cladius. Thrace, after that, continued to be a Roman Province until the demolishing of the Empire being a part of the Eastern Roman Empire after 395 BC. Turkish domination of the region commenced around 1354 by entering the forces of Süleyman Pasha into the region of Gelibolu. Şarköy and Malkara were both conquered in 1356 whereas Tekirdağ and Çorlu joined the Ottoman lands in 1357 after the conquests of Murat I.[173]

***Marmaraereğlisi District***

Marmaraereğlisi lies 90 km to İstanbul and a total of 38 km to the Province of Tekirdağ.[174]

History: Marmaraereğlisi (ancient city of Perinthos), located at the southern shores of the Turkish Thrace, is known to be founded by colonists from Samos around 600 BC. Nevertheless, archaeological excavations at Toptepe Mound, located 5 km west of Marmaraereğlisi, show that the region was already habituated by 4300 BC.

Having two natural harbours of importance for a developed trade and economy and being at the junction of all ancient roads contributed the city to develop. Following its foundation, in 570 BC, the city was unsuccessfully besieged by the colonists from Megara, who had also founded the neighbouring city of Selymbria (Silivri). The city faces a later and this time successful siege by Darius II in 514 BC during the great Thracian Expedition of the king. City stayed under Persian domination until 476-475 BC by the freeing of the whole region of Thrace by Cimon and his forces. Perinthos later joined the Attic-Delian League in 337 BC.

Philip II is also known to besiege the city with no success. However, his son Alexander the Great gained control of the city with the rest of Thrace and minted coins in his name there. The city flourished during the Hellenistic period. Another unsuccessful siege of the city was by the Pontic king Mithridates VI during the 1st century BC. Perinthous became the seat of the Provincial Governor following the establishment of Thrace as a Roman province in 46 AD. The city is known to gain much importance during the Roman period. This is mainly due to its positioning on VIA EGNATIA, the coastal road that stretched from Dyrrachium on the Adriatic coast until Byzantion (İstanbul), as well as being the ending point of the military road which commenced from Singidunum (Belgrad). In 196 AD Perinthos had sided with Rome during the war with Byzantion. Following the victory against Byzantion Roman Emperor Septimus Severus (193-211 AD) decreased the status of Byzantion to a village by giving all its lands to the people

[173] http://www.tekirdag.gov.tr/tekirdag-tarihi

[174] https://www.marmaraereglisi.bel.tr/content-1203-cografi_yapi.html

of Perinthos and additionally granted the city with rights to organize sports games. The people of Perinthous erected an over-life size sculpture of Septimus Severus within the city and constructed temples to commemorate the victory over Byzantion and honour the emperor.

The city was started to be known as Heraklia (the city of Herakles) following the death of Emperor Aurelian (270-275 AD). Heraklia was famous for its carpets throughout the whole 4th and 5th centuries AD. Unfortunately, its importance dramatically decreased after the partition of the Roman Empire in 395 AD. The city went under vast repair and re-urbanization processes' during the reign of Byzantine Emperors Anastasius (491-518 AD) and Justinianus (527-565 AD). It is also during these periods that the city had become a Piscobal centre.

Heraklia faced hard destructions and pillaging both during the Avar invasion of 591 AD and the Bulgarian invasion of 719. The city became a Venetian trading post starting in 1204. Finally, it was conquered by Süleyman Pasha and joined the Ottoman State in 1353 with the rest of Thrace.[175]

***Malkara District***

Malkara is located 56 km distance to Tekirdağ. Its north is occupied by the Uzunköprü District of Tekirdağ, northeast by Hayrabolu, southeast by Şarköy, south by the Gelibolu District of Çanakkale and west by the Keşan District of Edirne[176].

History: The first mention of Malkara is found in ancient written sources. The narratives supply us with the information on a building fortress at Gürgen Bayırı, a location nearby of Malkara, during the Persian Wars between Xerxes and the Greek poleis. As the surrounding of the fortress was bustling with snakes it was named Margar or Margaar in Persian, meaning Cave of Snakes (mar = snake and gaar= cave).

Another narrative on Malkara dates slightly later to the Hellenistic period. Following his cleansing of Thrace from the Persians, Alexander the Great had left some reserves at Malgar (Malkara) under three local commanders named Sazan, Malgar and Kumardar. The latter of the third is known to build a fortress in his name (probably at the locality still known as Kumardaş Tepe). Sazan also built a fortress (probably at the locality still known as Sazan Çiftliği) as well as Malgar (Malkara). All these fortresses lasted as important military posts throughout both the Roman and Byzantine periods.

Following its conquest by the Ottomans Malkara was settled by Yörük Turks that were deported from Anatolia. Additionally, certain Ahi groups were also brought to Malkara from the regions of Ankara and Çankırı (this must be the reason behind the naming of Ahievren Village). We know well that most of the Yörük's which had been settled in Malkara and its surroundings were from the Beylik of Saruhanlı that were deported during the reign of Mehmet (Çelebi) I (1402-1421). Those were deported from Konya, Aydın and Muğla and were led by the famed Paşaviğit (from whom the Paşaviğit town of Keşan is named after).

After the conquest of Constantinopolis by Turks, Malkara became an important strategic station and gathering point for the armies that would realize raids into Balkans. This importance of Malkara continued and during the reign of Fatih the Conqueror it was started to be known as Evlad-ı Fatihan, the center for the Turkish raiders.[177]

[175] https://www.marmaraereglisi.bel.tr/content-1202-tarihce.html

[176] https://www.malkara.bel.tr/malkara/cografya

[177] https://www.malkara.bel.tr/malkara/tarih

Archaeological Assets: Thrace is among the regions in which we have less archaeological knowledge. Especially our knowledge of the prehistory of Malkara and its surroundings is solely based on small-scale excavations and chance finds. This is indeed interesting as Malkara is one of the oldest settlements of Thrace and had always been an important centre by being at the junction of roads that connected Asia and Europe as well as Aegean and the Black Sea. Thanks to this advantage it had always been subject to any kind of cultural interaction and invasion of different cultures.

Below is a list of the archaeological and cultural remains and locations from Malkara and its neighbouring villages.

Mound – Tumulus: They are known as the burial places of the Thracian kings and aristocracy. They were built as artificial and high mounds which symbolized the wealth and superiority of their owners. Many were known to top the built chamber tombs. Tumuli were abandoned as being used as graves by the coming of Christianity to the region.

Among the most known tumuli from the region of Malkara, we can name Kermeyan Tumulus, which is the largest thanks to its height and radius. The artificial mound of the tumulus has a height of 10 m. It is much affected by agricultural ploughing and illicit excavations.

The tumulus belongs to a group of tumuli all located around the city of Apri (Kermiyan Neighborhood) located on the ancient Roman road of VIA EGNATIA. Since Apri is especially known to be an important Roman settlement the tumulus is likely of Roman date.

Another tumulus is located in the Kum locality of the Kırıkali Neighbourhood. Like the former, it measures 10 m in height. Interestingly it is located on the same axis as the Kermeyan Tumulus. This tumulus has a flattened top.

Other tumuli from the region are found in the localities of Kartaltepe, Tavşantepe, within the limits of the Tugay District, Batkın, Hacısungur, Kürtüllü, Kozyörük, Sarnıç, Tekke, Pirinççeşme, Kavakçeşme, Gözsüz, Müstecep and Yılanlı neighbourhoods.

Ruins of Yenatuz: These ruins are also located within the limits of the Kermeyan Village. Its history goes as back to the time of the Thracian tribes. Dedication fragments some of which bearing the name VESPASIANOS are indicative of its importance during the Roman period too. Nevertheless, the ruins are generally accepted to date from the Byzantine period.

Kermeyan Castle: Kermeyan Castle, also known by the name Kermeyan Kal'ası (Zesutare), is among the most important castles in its region. Its ancient name was Apri. It is located in a 200-hectare area within the limits of the Kermeyan village between the rivers Taşlık and Kala. Castle is built of Keşan stones.

Elmalı and Yenidibek Castles: Two castles slightly in ruins are known first from the Elmalı and second from the Yenidibek neighbourhoods of Malkara. The latter is also named Blovazt Kala. Both castles rest on high hills that dominate vast lands around them. Their positions indicate that both castles had served important duties of protection for many centuries. Their destruction must be sought in the Ottoman era.

Karacahalil (Kocakale) Castle: The castle, also known as Kocakale, lies within the limits of the Karacahalil Village. It sits on an advantageous high ground with a perfect view of the Dardanelles and the Bay of Saros. Surface finds from the castle indicate that it was continuously in use from the 5th century BC until the Roman period.

#### 6.3.2.3.2 General State of the Project Area, Archaeological Findings (1st Survey)

Archaeological survey and fieldwork focusing on the Kınalı-Malkara Motorway Project, which is planned to be built along a 130 km length passing through Silivri-Marmraereğlisi-Süleymanpaşa-Çorlu and Malkara districts, was carried out in May-June 2022.

The Ministry of Culture and Tourism staff informed the Project company about the existence of two registered sites in the vicinity of Süleymanpaşa District of Tekirdağ Province through report sharing. Although the exact coordinates of these sites are not available, they were identified during the fieldwork. However, the distances given to the Project axis by the decision of the Conservation Board for these tumulus sites were found to be insufficient. Accordingly, the information provided in the Board's decision on these registered sites and the specific additional information and recommendations as a result of the recent field survey will be briefly mentioned.

Information about the archaeological findings is provided in the following sections. Satellite image showing Project Site and general archaeological assets in the vicinity is presented in Figure 118.

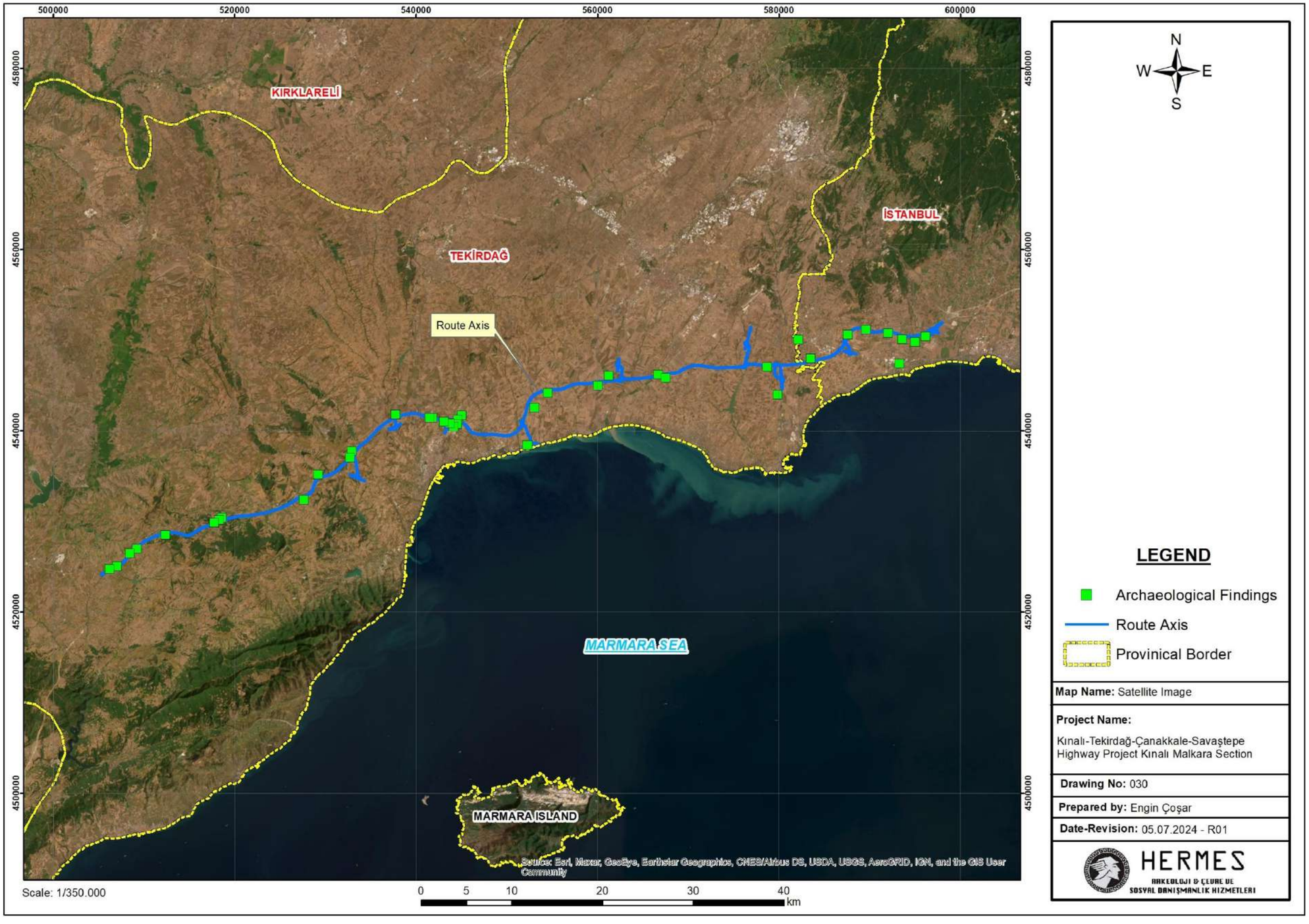



**Figure 118: Satellite Image Showing Project Route and Identified Archaeological Assets**

### İstanbul Province

During the field studies initiated from the borders of Silivri District, eight archaeological site discoveries that are not yet known have been made. These areas include historical bridges, tumuli, ancient settlements, and mounds.

The works on this zone which has a route length of 8 km around the border of İstanbul were commenced on 24.05.2022 and lasted for two days. Information on the inspected areas is given below.

**Table 145: Province of İstanbul, Archaeological and Cultural Heritage Findings**

| No | Site Name/ Code | Findings Type | Period | From TR Ministry of Culture and Tourism | | | Province | District/ Village | Distance Between Route (m) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Reg. | Unreg. | Unknown | | | |
| 1 | HRM-1 | Altun Tepe Tumuli | Roman | | X | | İstanbul | Silivri | 328 m |
| 2 | HRM-2 | Settlement | Roman/ Byzantine | | X | | İstanbul | Silivri | 515.5 m |
| 3 | HRM-3 | Bridge | Early Republic | | X | | İstanbul | Silivri | 368.5 m |
| 4 | HRM-4 | Bridge | Early Republic | | X | | İstanbul | Silivri | 2.500 m |
| 5 | HRM-5 | Mound | Roman | | X | | İstanbul | Silivri | 53 m |
| 6 | HRM-6 | Flat Settlement | Byzantine/Ottoman | | X | | İstanbul | Silivri | 63 m |
| 7 | HRM-7 | Multi stratigraphy Mound | Chalcolithic, Roman, Byzantine | | X | | İstanbul | Silivri | On the route axis |
| 8 | HRM-8 | Flat Settlement | Late Roman/Byzantine | | X | | İstanbul | Silivri | 320 m |

**Reg: Registered Uneg: Unregistered*

*HRM-1 Altuntepe Tumuli*

The tumulus is located in the Province of Istanbul, within the borders of the Silivri district. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region. No traces of looting were found during the survey, and only a few randomly dispersed sherds of ceramics were located on the surface. Due to the density of the vegetation on the ground, the surface examination was limited.




**Figure 119: General View of Archaeological Area**

*HRM-2 Settlement, Roman and Byzantian Period*

It is located in the Province of Istanbul, within the borders of the Silivri district. Surrounded by two rivers from the south of the Çeltik District as well as on the east and west sides, the archaeological site is characterized by an intense ceramic repertory on the surface. Based on the findings, it can be suggested that the site was inhabited during both the Late Roman and Byzantine periods. Among the surface finds, apart from the ceramics, there are many pieces of roof tiles, glass bracelets and also Byzantine ceramics glazed in brown and with decoration. On the other hand, the amorphous stones seen at the summit of the hill suggest that they are surfaced architectural elements from buildings.





**Figure 120: General View of Archaeological Area and Findings**

*HRM-3 Bridge*

It is located in the Province of İstanbul, within the borders of the Silivri district. The bridge is located at the point where the access road joining the main route begins. The structure is on an actively used route. It was built on the Kula stream and its buttresses made of well-cut stone blocks are still visible on both sides of the stream. On the buttresses, which have a height of approximately 2 m, there are horizontal concrete blocks which were added later to ensure safe passage for modern vehicles. The mid-portion of the ancient bridge was not preserved, stones of which can still be seen dispersed on the sides of the stream.

There is no clear information on the actual date of the bridge, but through similar, an early Republican date can be securely suggested.




**Figure 121: General View of Archaeological Area**

*HRM-4 Bridge*

It is located in the Province of İstanbul, within the borders of the Silivri district. The bridge is located at the point where the access road joining the main route begins. The structure is on an actively used route. It was built on the stream and its buttresses made of well-cut stone blocks are still visible on both sides of the stream. On the buttresses, which have a height of approximately 2 m, there are horizontal concrete blocks which were added later to ensure safe passage for modern vehicles. The mid-portion of the ancient bridge was not preserved, stones of which can still be seen dispersed on the sides of the stream.

There is no clear information on the actual date of the bridge, but through similarity, an early Republican date can be securely suggested.

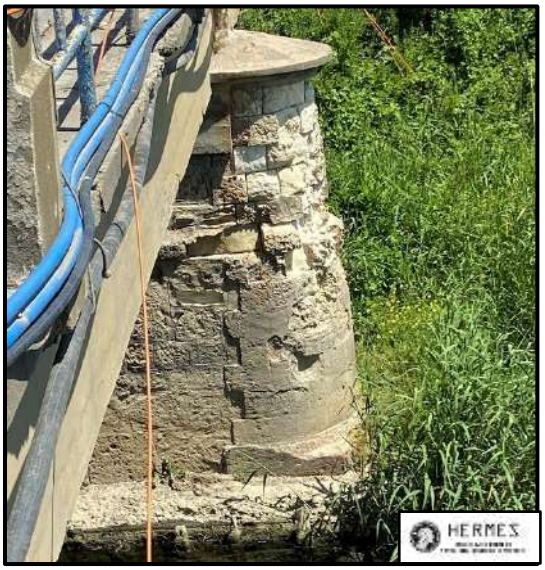



**Figure 122: General View of Archaeological Finding**

*HRM-5 Mound/Settlement*

It is located in the Province of İstanbul, within the borders of the Silivri district. An intense ceramic layer is evident on the surface of the mound, which is located in the southwest of the Çeltik District and on the side of the Çanta Stream. Based on the findings, it can be put forward that the area was inhabited during the Hellenistic and Roman periods. Intense fragments of roof tiles and pots for daily use together with black slip ceramics of Late Hellenistic-Early Roman date were encountered. In addition, a few pieces of human bones were encountered and there is a possibility that a necropolis had existed in the area. Many looters' pits were encountered around the area.




**Figure 123: General View of Archaeological Area**




**Figure 124: General View of Archaeological Findings**

*HRM-6 Flat Settlement*

It is located in the Province of Istanbul, within the borders of the Silivri District. The settlement is located in the southwest of the Çanta neighbourhood on a Flat facing south. Ceramic sherds that are not densely spread around can be seen throughout the surface of the settlement area. Based on the findings, it can be put forward that the settlement was inhabited during the Hellenistic and Roman periods. A fragment of roof tile, some fragments from pots of daily use and a black slip ceramic fragment, finds of Late Hellenistic-Early Roman date, were encountered. Considering its location, there is a possibility that the area was indeed a necropolis.

The Project Route passes through the southern part of the identified area. There is no direct contact with the Project Route.




**Figure 125: General View of Archaeological Area and Findings**

*HRM-7 Mound, Early Period*

It is located in the Province of Istanbul, within the borders of the Silivri District. The site is located in the east of the Değirmenköy District partially on a high ground that dominates the plain. Ceramic finds from various periods can be seen dispersed on the surface of the mound. Based on the findings, it can be stated that the area was inhabited uninterruptedly during the Chalcolithic period, the Iron Age, the Hellenistic Period, the Roman period and finally the Byzantine period.

The finds mostly consisted of roof tile fragments, fragments from pottery for daily use, fragments from stone axes and blades, seashells (used as dyestuff or jewellery), glass bracelet fragments, a kylix handle, worked bone fragments, black slipped and also later ceramics of Hellenistic-Early Roman date. Considering the spread of the settlement and the finds located, it can be suggested that this locality once housed one of the largest settlements in the region.

The site lies directly on the construction area of the Project Route.




**Figure 126: General View of Archaeological Area and Findings**

*HRM-8 Flat Settlement*

It is located in the Province of Istanbul, within the borders of the Silivri district. The settlement, which is located in the southwest of the Değirmenköy district, is 320 m away from the main route axis. On the surface, ceramics can be seen dispersed around which are not much in numbers. Based on the finds, it can be put forward that the area was inhabited during the Late Roman-Early Byzantine periods. A fragment from a roof tile and fragments of pottery for daily use were encountered. Considering its location, the area is likely to be a necropolis, but the finds favour more the possible existence of a simple rural settlement within the locality.




**Figure 127: General View of Archaeological Findings**

**Tekirdağ Province**

After passing the Silivri District, the fieldwork continued within the provincial borders of Tekirdağ. During the on-site studies, 32 unknown archaeological site discoveries were realized. These include historical bridges, tumuli, ancient settlements, aqueducts, cemetery areas, necropolis, and mounds.

In this section, investigations were made in Marmaraereğlisi, Çorlu, Süleymanpaşa and Malkara districts, respectively. The works on this zone which has a route length of 88 km around the border of Tekirdağ were commenced on 25.05.2022 and lasted for nine days. Information on the findings is given below.

**Table 146: Province of Tekirdağ, Archaeological and Cultural Heritage Findings**

| No | Site Name/Code | Findings Type | Period | From TR Ministry of Culture and Tourism | | | Province | District/ Village | Distance Between Route (m) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Reg. | Unreg. | Unknown | | | |
| 9 | HRM-9 | Tumulus | Roman | | X | | Tekirdağ | Marmaraereğlisi | 650 m |
| 10 | HRM-10 | Historical Bridge | Roman | | | X | Tekirdağ | Marmaraereğlisi | 2.600 m |
| 11 | HRM-11 | Rural Settlement | Late Ottoman | | X | | Tekirdağ | Marmaraereğlisi | 80 m |
| 12 | HRM-12 | Rural Settlement | Late Ottoman | | X | | Tekirdağ | Marmaraereğlisi | 84 m |
| 13 | HRM-13 | Rural Settlement | Late Ottoman | | X | | Tekirdağ | Marmaraereğlisi | 380 m |
| 14 | HRM-14 | Rural Settlement | Late Ottoman | | X | | Tekirdağ | Çorlu | 450 m |
| 15 | HRM-15 | Potential Tumulus | Roman | | X | | Tekirdağ | Çorlu | 330 m |
| 16 | HRM-16 | Settlement and Necropolis | Roman | | X | | Tekirdağ | Süleymanpaşa | 160 m |
| 17 | HRM-17 | Settlement | Late Ottoman | | X | | Tekirdağ | Süleymanpaşa | 750 m |
| 18 | HRM-18 | Tumulus | Roman | | X | | Tekirdağ | Süleymanpaşa | On the route axis |
| 19 | HRM-19 | Tumulus | Roman | | X | | Tekirdağ | Süleymanpaşa | On the route axis |
| 20 | HRM-20 | Rural settlement and Shrine | Late Ottoman | | X | | Tekirdağ | Süleymanpaşa | 560 m |

| No | Site Name/Code | Findings Type | Period | From TR Ministry of Culture and Tourism | | | Province | District/ Village | Distance Between Route (m) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Reg. | Unreg. | Unknown | | | |
| 21 | HRM-21 | Rural settlement | Late Ottoman | | X | | Tekirdağ | Süleymanpaşa | On the route axis |
| 22 | HRM-22 | Necropolis | Byzantine | | X | | Tekirdağ | Süleymanpaşa | 205 m |
| 23 | HRM-23 | Rural settlement | Late Ottoman | | X | | Tekirdağ | Süleymanpaşa | 5 m |
| 24 | HRM-24 | Potential Tumulus | Roman | | X | | Tekirdağ | Süleymanpaşa | 75 m |
| 25 | HRM-25 | Aquaeduct | Roman | X | | | Tekirdağ | Süleymanpaşa | 235 m |
| 26 | HRM-26 | Necropolis | Byzantine | | X | | Tekirdağ | Süleymanpaşa | 200 m |
| 27 | HRM-27 | Necropolis and settlement | Byzantine/Late Ottoman | | X | | Tekirdağ | Süleymanpaşa | 148 m |
| 28 | HRM-28 | Settlement | Late Ottoman | | X | | Tekirdağ | Süleymanpaşa | 52 m |
| 29 | HRM-29 | Rural settlement | Roman/Late Roma | | X | | Tekirdağ | Süleymanpaşa | 230 m |
| 30 | HRM-30 | Rural settlement | Late Ottoman | | X | | Tekirdağ | Süleymanpaşa | 15 m |
| 31 | HRM-31 | Güvençli Cemetery | Ottoman/Modern | | X | | Tekirdağ | Süleymanpaşa | 355 m |
| 32 | HRM-32 | Nusratfakı Cemetery | Ottoman/Modern | | X | | Tekirdağ | Süleymanpaşa | 308 m |
| 33 | HRM-33 | Rural settlement | Byzantine | | X | | Tekirdağ | Süleymanpaşa | 335 m |

| No | Site Name/Code | Findings Type | Period | From TR Ministry of Culture and Tourism | | | Province | District/ Village | Distance Between Route (m) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Reg. | Unreg. | Unknown | | | |
| 34 | HRM-34 | Rural settlement | Byzantine | | X | | Tekirdağ | Süleymanpaşa | 205 m |
| 35 | HRM-35 | Necropolis and settlement | Late Roman/Byzantine | | X | | Tekirdağ | Süleymanpaşa | 65 m |
| 36 | HRM-36 | Settlement | Byzantine | | X | | Tekirdağ | Süleymanpaşa | 105 m |
| 37 | HRM-37 | Necropolis | Roman | | X | | Tekirdağ | Malkara | 97 m |
| 38 | HRM-38 | Settlement | Late Roman/Byzantine | | X | | Tekirdağ | Malkara | On the route axis |
| 39 | HRM-39 | Potential Necropolis | Hellenistic /Roman | | X | | Tekirdağ | Malkara | On the route axis |
| 40 | HRM-40 | Potential Necropolis | Late Roman/Byzantine | | X | | Tekirdağ | Malkara | 35 m |

**Reg: Registered Uneg: Unregistered*

*HRM-9 Tumuli*

It is located within the borders of the Marmaraereğlisi District of Tekirdağ Province. The location and general characteristics of the mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other tumuli in the region. During the survey, many traces of illegal excavations were found on it, and a few fragments of ceramics were seen thrown on the surface. Due to the density of the vegetation, the visual surveying of the locality could be limitedly realized.

Possible elevations that are situated near a project can be used for quarry or material obtaining. This site is located far from the route, but was recorded because it reflects the potential for use as a quarry.




**Figure 128: General View of Archaeological Area**



**Figure 129: General View of Illegal Excavation**

*HRM-10 Bridge, Roman Period*

It is located within the borders of the Marmaraereğlisi District of Tekirdağ Province. The ancient bridge, which was identified, is actually registered as the 'Seymen-Roman Bridge' within the Inventory of the Ministry of Culture and Tourism.

The historical bridge, located on the Kumlubağ Stream, acts as a natural border between the provinces of Tekirdağ and İstanbul. The distance of the bridge, which has three arches and a height of approximately 5 m, to the Project Route is 2.6 km. This historical structure is in active use even today.




**Figure 130: General View of Archaeological Area**

*HRM-11 Rural Settlement*

It is located within the borders of the Marmaraereğlisi District of Tekirdağ Province. The settlement area, located in the south of Seymen village on the edge of a river, is 80 m from the main axis. On the surface, dense and coarse ceramic findings were seen scattered around. Based on the finds, it can be stated that the area was inhabited during the Late Byzantine or Ottoman periods. A fragment of a roof tile and other fragments from pots for daily use were among the encountered finds. All finds point to the fact that it is a simple rural settlement.




**Figure 131: General View of Archaeological Area and Findings**

*HRM-12 Rural Settlement*

It is located within the borders of the Marmaraereğlisi District of Tekirdağ Province. The settlement area, located in the northwest of the Çeşmeli village is 84 m from the main axis. The area is located nearby to the Köprüce River. Dense and coarse ceramic findings were seen scattered around the surface. Based on the finds, it can be stated that the area was inhabited during the Ottoman period. A fragment of a roof tile and other fragments from pots for daily use were among the encountered finds. All finds point to the fact that it is a simple rural settlement.




**Figure 132: General View of Archaeological Area and Findings**

*HRM-13 Rural Settlement*

It is located within the borders of the Marmaraereğlisi District of Tekirdağ Province. The settlement area, located in the northwest of the Çeşmeli village is 380 m from the main axis. The area is located nearby to the Muhacırçayı River. Dense and coarse ceramic findings were seen scattered around the surface. Based on the finds, it can be stated that the area was inhabited during the Byzantine and Ottoman periods. A fragment of a roof tile and other white/blue/green or brown glazed fragments from pots for daily use were among the encountered finds together with terracotta pipes. All finds point to the fact that it is a simple rural settlement.




**Figure 133: General View of Archaeological Area and Findings**

*HRM-14 Rural Settlement*

It is located within the borders of the Çorlu District of Tekirdağ Province. The settlement area, located towards the west of Yukarıçengelli ve Aşağıçengelli farmsteads is 450 m from the main axis. The area is located in between two streams. Dense and coarse ceramic findings were seen scattered around the surface. Based on the finds, it can be stated that the area was inhabited during the Ottoman period. A fragment of a roof tile and other fragments from pots for daily use were among the encountered finds. All finds point to the fact that it is a simple rural settlement.



**Figure 134: General View of Archaeological Area and Findings**

*HRM-15 Potential Tumuli*

It is located within the borders of the Çorlu District of Tekirdağ Province. The area in the form of two mounds located in the Kartaltepe district is situated on a high hill and dominates the landscape due to its location. No ceramic finds were encountered during the survey.

It has been observed that there had been various illegal excavations especially on and around the mounds located on the hill. Those mounds have the potential to be tumuli.




**Figure 135: General View of Archaeological Area**

*HRM-16 Settlement and Necropolis*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. At a point 1 km northwest of Karaevli Village, between 2 hills and in an area close to the water source, intense Roman findings were encountered. Indeed, there are intense finds on the Flats of both hills.

The finds from this area, which is 160 m away from the main axis, are constituted of half fragmented lamp, a front human tooth, ceramics of daily use, roof tile fragments, fragments of Roman fine pottery, a pithoi fragment together with fragments from the bottom of an amphora. Based on the ceramics, it can be suggested that the area was inhabited between the 3rd and 7th centuries AD. Whether the discovered area was used as a settlement or just a necropolis could only be clarified following later more detailed studies.




**Figure 136: General View of Archaeological Area and Findings**

*HRM-17 Rural Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. It lies in an area located to the west of Gazioğlu Village and next to the west entrance of the village. Especially vast amounts of roof tiles were encountered around the locality.

Based on the finds collected from this area, which is 750 m away from the main axis, it can be suggested that the location might be a Late Ottoman settlement. The finds that can be seen on the surface are all ceramics for daily use and roof tiles.




**Figure 137: General View of Archaeological Findings**

*HRM 18 and 19, Tumuli*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. Two different mounds were encountered, side by side and with sea view, in the area which will be connected to the Tekirdağ-İstanbul highway. It is known that there are 2 already registered tumuli side by side in the region, but their locations are not known since the survey team was not supplied with proper information related to their positioning.

As such, the mounds which are on the connection route are directly in the impact area of the Project. Nevertheless, no ceramics were encountered during the survey.




**Figure 138: General View of Archaeological Areas**

*HRM-20 Rural Settlement and Shrine*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. The Çoban Baba Shrine (türbe in Turkish) is located at the southeast entrance of Kayı village. During the surveys made around the shrine, few ceramic sherds were found only on the Flat of the hill where it is located.

The shrine is located at a distance of 560 m from the main axis and is quite far from the impact area of the Project, however, since it is a feature that is designated as intangible cultural heritage, the access of the people of the region to the shrine should not be prevented or the people visiting the site should not be disturbed especially during the construction period. Precautions should be taken in such matters against possible negative effects that may arise from the construction.

The finds mainly consist of green glazed pottery and sherds of pots for daily use which are thought to date to Ottoman period. The shrine isoutside the scope of construction.




**Figure 139: General View of Archaeological Area and Findings**

*HRM-21 Rural Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. It is located far away. Some ceramic sherds that can be dated to the later periods were encountered during the surveys. The region is registered on topographic maps as the “Armenian Mound Location”. The site lies directly on the construction area of the Project Route.

Regarding the area, which we can date to the Late Ottoman-Early Republic periods, we can state that it was a rural settlement or a farmstead. The finds mainly consist of fragments of pottery for daily use and roof tiles.

The site lies directly on the construction area of the Project Route.



**Figure 140: General View of Archaeological Area and Findings**

*HRM-22 Necropolis*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. It falls approximately 205 m towards the south of Kayı village and to the junction point of the Project. During the survey ceramic fragments were seen to spread over a wide area. In addition to ceramics, human bones have also been observed in some areas. It is thought that the area where a leg bone and skull fragment were located must have been used as the burial ground of the settlement.

The finds mainly consist of fragments of pottery for daily use and roof tiles.




**Figure 141: General View of Archaeological Area and Findings**

*HRM-23 Rural Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. It falls south of Kayı village, close to Tekirdağ City Hospital and is in direct contact with the Project Route. During the survey, ceramic sherds that spread in a small area were encountered.

Since the site is in contact with the main axis of the Project, it is recommended to conduct Museum-controlled works before the construction. The finds mainly consist of fragments of pottery of daily use together with roof tiles.

The area, which can be dated to the Late Ottoman-Early Republic periods, can be interpreted as a rural settlement or a farmstead.




**Figure 142: General View of Archaeological Area and Findings**

*HRM-24 Potential Tumulis*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province, near the southwest entrance of Kayı village.

It lies at a distance of approximately 75 m from the route and has been evaluated as a "potential tumulus" due to its dominance over the area and structural character.




**Figure 143: General View of Archaeological Area**

*HRM-25 Aqueduct*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province within a valley falling towards the southwest of Kayı village. Its distance to the Project Route is 235 m within a south orientation.

Since the area is densely forested, it was not possible to survey deep into the trees for obtaining technical and visual data from the feature.

In the paper of Edirne Regional Board for Preservation of Cultural Heritage, it is stated that: "Museum should be informed before any work and any work that should be carried later on must be under the supervision of the museum since the route passes from a close distance of the registered aqueduct." According to the library research, the aqueduct in question in this paper is dated to the 5$^{th}$ century AD.




**Figure 144: General View of Archaeological Area**

*HRM-26 Necropolis*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province and falls towards the west of Kayı village. Intense ceramic finds were encountered on the surface during the survey. Especially the area where roof tile fragments were located is likely to be a necropolis. The finds mainly consist of fragments of pottery for daily use and roof tiles.

The area, which can be dated to the late Ottoman period, can be designated as a farming/rural settlement.




**Figure 145: General View of Archaeological Area**

*HRM-27 Necropolis and Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. The area, which lies towards the south of the new Tekirdağ City Cemetery, is located on a relatively high and dominant hill and can be interpreted as a settlement dating to the Byzantine period. The railway that goes to Tekirdağ passes through the middle of the

archaeological site at the peak point and thus in this current state had caused great destruction. For this reason, the field nowadays looks like two separate plots.

Intense ceramic finds were encountered scattered on the surface during the survey. Particularly the area where roof tile fragments, fragments of daily use vessels, fragments of glazed (green and yellow) ceramics and handle fragments from amphorae are predominantly found together with human skull fragments, can be interpreted as a necropolis.

The area, which dates to the Byzantine period, might have been a large settlement.




**Figure 146: General View of Archaeological Area**



**Figure 147: General View of Archaeological Findings**

*HRM-28 Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province, lying at a 52 m distance from the Project Route. It is nearby of the Karacamurat Farm.

During the surveys, many ceramic finds were detected which were spread over a wide area.

When finds are considered it is seen that mostly container fragments of pottery for daily use were found. Fragments from kitchenware (such as jug handles, body and rim pieces from plates) were detected intensively. Ceramics that

can be dated into the Byzantine period are glazed (yellow, green, and brown). The area, which can be designated as a Flat settlement, continues up to the stream bed.




**Figure 148: General View of Archaeological Area**



**Figure 149: General View of Archaeological Findings**

*HRM-29 Rural Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province falling towards the northeast of Seymenli village. It is 230 m away from the main axis. On the surface of the area, which is on the edge of Pamuklukderesi Stream, both coarse and fine ceramics were not seen in very large numbers. Based on the finds, the area was understood to be inhabited during the Byzantine-Ottoman periods. Fragments from bowls were encountered together with body and mouth fragments from various jugs.




**Figure 150: General View of Archaeological Area and Findings**

*HRM-30 Rural Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province falling towards the east of Seymenli village. Reflecting the characteristics of a Flat settlement the area lies 15 m away from the main axis. On the surface of the area, which is on the edge of Darı Stream, both coarse and fine ceramics were not seen in very large numbers. Based on the finds, the area was understood to be inhabited during the Byzantine-Ottoman periods. Fragments from bowls were encountered together with body and mouth fragments from various jugs.




**Figure 151: General View of Archaeological Area and Findings**

*HRM-31 Güvençli Village, Cemetery*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. It is the cemetery located at the south entrance of Güvençli village, around the Bayırarkası area, and lies 355 m from the main axis. The cemetery houses graves topped by anonymous stones from the Early Republican era.

Although the archaeological site is not close to the route, this cemetery is considered within the scope of intangible and tangible cultural heritage.




**Figure 152: General View of Archaeological Finding**

*HRM-32 Nusratfakı Village, Cemetery*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province. It is a cemetery located towards the northwest of Nusratfakı village and lies 308 m from the main axis. The cemetery houses graves topped by anonymous tombstones from the Early Republican era together with a single grave bearing a decoration in the form of a turban, thus dated probably to the Late Ottoman period.

Although the archaeological site is not close to the route, this cemetery is considered within the scope of intangible and tangible cultural heritage.




**Figure 153: General View of Archaeological Finding**

*HRM-33 Rural Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province, located in the north of Akçahalil village within Örenkavak locality. It is a Flat settlement that is at a distance of 335 m from the main axis. Glazed and unglazed ceramics that can be dated to the Byzantine period were encountered on the surface in and around the settlement area. Due to the dense vegetation covering the area, the spread of the settlement could not be securely determined by a detailed survey.




**Figure 154: General View of Archaeological Area and Findings**

*HRM-34 Rural Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province, in the north of Akçahalil village around the Kumlar ridge area. Designated as a rural Flat settlement the area is 205 m away from the main axis. On the surface of the area, both coarse and fine ware ceramics were located in small amounts. Based on the finds, it can be put forward that the area was inhabited during the Byzantine-Ottoman periods. Fragments of pottery for daily use consisting of various body sherds from jugs together with rim and handle fragments as well as fragments from roof tiles were encountered.




**Figure 155: General View of Archaeological Area and Findings**

*HRM-35 Necropolis and Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province, in the north of Akçahalil village. The area is located on a relatively high Flat. The area is 65 m away from the main axis.

During the surveys, intense ceramic finds were encountered on the surface. It is highly possible that the area was a necropolis. Recovering of human bone fragments, especially in the area where fragments of roof tiles, sherds of pottery for daily use, sherds of Roman pottery together with handle and bottom fragments from amphorae are concentrated also support this.




**Figure 156: General View of Archaeological Area and Findings**

*HRM-36 Flat Settlement*

It is located within the borders of the Süleymanpaşa District of Tekirdağ Province, in the north of Dereköy village. The area is 105 m away from the main axis.

During the survey, many ceramics finds that were spread over a wide area were encountered.

Considering the findings, it can be stated that mostly fragments from container vessels of daily use were found. Fragments from kitchenware such as jug handles and body or rim fragments from plates were frequently detected. Ceramics that we can date to the Byzantine period are generally glazed (yellow, green and brown). The area, which can be designated as a Flat settlement, continues upwards along a stream bed.




**Figure 157: General View of Archaeological Area and Findings**

*HRM-37 Necropolis*

It is located within the borders of Malkara District of Tekirdağ Province towards 3 km east of the village of Ahievren. The name of the hill on which it is located is known as Döngel Tepe. It has been observed that there is a dense amount of roof tile fragments at the peak of the hill. Considering its location, the dominance of the area and other features, the probability of the area being a necropolis is quite high.

The finds located on the surface, which is 97 m away from the main axis, are mostly fragments of roof tiles and pottery for daily use. Based on the ceramics, it can be stated that the area was inhabited between the 6th and 8th centuries AD.




**Figure 158: General View of Archaeological Area and Findings**

*HRM-38 Rural Settlement*

It is located within the borders of Malkara District of Tekirdağ Province at a locality called Ören Pınarı Mevkii. The site reflects the characteristics of Flat settlement spreading over a very wide area and continuing until the stream bed. It is located on the main Project axis. Being by the side of the modern D400 Highway, the site must have also been on the axis of a main ancient route.

Fragments of roof tiles together with Byzantine glazed ceramics were found scattered all around the surface. Simple linear marks, of which we have seen many examples in the Roman period, were seen on the roof tiles. In addition,

numerous amphora handles were located too. As a result of the detailed survey, it can be suggested that the area was inhabited during the Late Roman and Early Byzantine periods. Ceramics dated to the Byzantine period are generally glazed (yellow, green, and brown).




**Figure 159: General View of Archaeological Area and Findings**

*HRM-39 Potential Necropolis*

It is located within the borders of the Malkara District of Tekirdağ Province, located southeast of the Ahievran village. The archaeological site, which lies on a Flat, is on the main axis. Not much pottery was detected on the surface, but a fragment of black glazed ceramic of Hellenistic date was found. Additionally, a fragment from a fragrance

container of Roman date is another important find. Moreover, the presence of roof tile fragments in the area emphasizes the high possibility of the site being a necropolis.



**Figure 160: General View of Archaeological Area and Findings**

*HRM-40 Potential Necropolis*

It is located within the borders of the Malkara District of Tekirdağ Province, located south of the Ahievran village. The archaeological site, being on a Flat, is located 35 m from the main Project axis. The fact that the roof tiles were found in great numbers in the area points to the possible designation of the area as a necropolis.



**Figure 161: General View of Archaeological Area and Findings**

#### 6.3.2.3.3 General State of the Project Area, Archaeological Findings (2nd Survey)

Certain investigations were realized within the borders of the Silivri District of İstanbul Province and Marmaraereğlisi, Çorlu, Süleymanpaşa, Malkara and Şarköy districts of the Tekirdağ Province between 23.01.2023 and 29.01.2023. Within those investigations, storage areas, quarries, borrow pits and facility areas were inspected together with the transportation route starting from the quarry in Danamandıra Village and continuing to the Tepeköy Quarry located within the borders of the Sarköy District of Tekirdağ.

Many of the locations that were designated for the facilities area consist of either existing or operating quarries. The investigations were realized as taking those areas for focal centres. However, the designated areas are not plot-based or small-scale areas, but rather possess large surface areas as extensional circles. In this context, a “detailed examination” of all areas was not possible. Considering the size of the areas, priority was given to literature research together with map analysis’ to be followed by the marking of some areas on the map. The marked suspicious areas were especially visited during the survey and the areas subject to cultural heritage were marked. Afterwards, investigations were made in the areas where transportation allowed, and many archaeological sites were identified.

The most important impact analysis parameter is distance, and in order to analyze the impact on an archaeological site, the exact location of the facility and the source/type of impact that may occur should be clearly known. The associated facilities' site boundaries were given in large diameters. This study was conducted based on the information that a facility area will be constructed in a suitable location within these areas. Therefore, archaeological impact assessment could be made in a limited way.

Since the location named Borrow pit-4 (Bıyıkali) is a military zone, no investigation could be carried out. Any possible investigation in the area in question is subject to a special permit.

A total of 65 cultural heritage sites were identified during the assessments. The coding for the mentioned fields is indicated as CHA. This is due to the use of HRM coding within the scope of the 1st survey. These 2 different studies were conducted on different dates and with different characteristics, so the results are presented in a way to avoid overlapping information in separate sub-headings.

Information about the archaeological findings is provided in the following sections. Satellite image showing Project site and general archaeological assets in the vicinity is presented below.

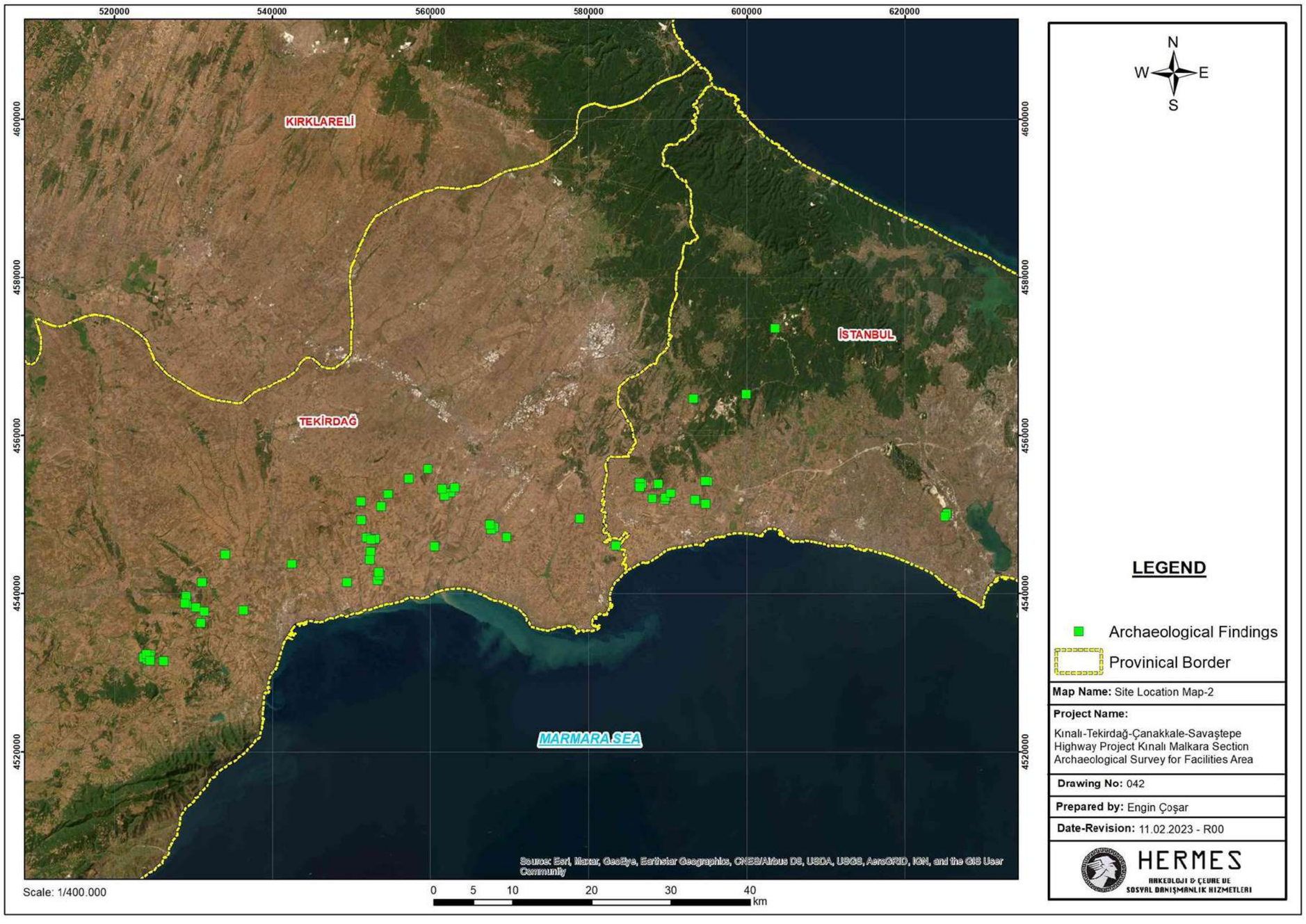



**Figure 162 General View of Archaeological Findings of the Facilities Areas**

*CHA-1 Cemetery*

The area of mention is present in the use cemetery of the Muratbey Village. The cemetery is in the south of Muratbey Village.

Though no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 163: General View of Cemetery Area**

*CHA-2 Ottoman Settlement*

It is located on a slope in the south of Muratbey village. Handles and body sherds were also found together with many amorphous or coarse pottery fragments.

Based on the finds, it can be stated that the site can date into the Late Ottoman period.




**Figure 164: General View of Archaeological Area**

*CHA-3 Potential Archaeological Site*

It is a mound located on the south of the Muratbey village. With its location and shape, it gives the impression of a tumulus. However, only a few discoveries of pottery fragments were made during the field investigation.

In this context, it was deemed appropriate to specify it as a potential area.




**Figure 165: General View of Potential Archaeological Area**

*CHA-4 Cemetery*

The area of mention is the current cemetery of the Danamandıra Village. The cemetery lies towards the west of Danamandıra Village and the Danamandıra Quarry. Also, it is on the way to Danamandıra Nature Park. The nature park is in contact with the designated area.

Though no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 166: General View of Cemetery**

*CHA-5 Sinekli Train Station*

Sinekli train station is located within the border of Küçük Sinekli Village from the Silivri District of Istanbul Province. The name of the train station, which consists of several building complexes, has an important place in history.

The Orient Express, which departed from Istanbul to Vienna in May 1891, was attacked between Sinekli and Çerkezköy. The bandit gang led by Captain Anastaş, who derailed the train, took the valuable belongings of the passengers, and also kidnapped five passengers to the mountain. In the incident that caused a scandal throughout Europe, the hostages were rescued by paying a ransom of 8,700 Ottoman liras (200.000 Francs) to the bandit. Though his gang was caught, Anastaş and the money he took were never found.

The relevant building complex is registered and is located on the shipping route. The main building is of wooden construction and has been restored. Other structures of the building are made of stone blocks.




**Figure 167: General View of Sinekli Train Station**

*CHA-6 Cemetery*

The area of mention is the current cemetery of the Beyciler Village. The cemetery is located towards the south of Beyciler Village and close to the shipping route. As a result of this location, it will likely be affected by any of the construction works.

Though no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 168: General View of Beyciler Cemetery**

*CHA-7 Çeltik Mound*

A mound, named Çeltik, was located at a point situated the west of the Tatlı River. It spreads over a wide area and is thought to have been inhabited during the Hellenistic and Roman periods.

The mound, which has not been damaged much, is well preserved. Many pottery fragments were encountered on the surface all around the area which is thought to be not registered. The fragments are from daily ware bowls, roof tiles, kitchenware, and glazed drinking bowl etc.

The site falls towards the east of Çeltik Village near the river, within the limits of the Storage Area – 1 (Çeltik).




**Figure 169: General View of Çeltik Mound and Ceramic Findings**

*CHA-8 Tumuli*

The tumulus is in the Province of Istanbul, within the borders of the Silivri District and Çeltik village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.  Due to the density of the vegetation on the ground, the surface examination was limited.

There is a visible mound that was partially destroyed as a water tank was built on it. The presence of a Corinthian capital in two pieces near the mound also strengthens the possibility of it being a tumulus.

It is located on the edge of the area called Storage Area – 1 (Çeltik) and at the entrance of the village.




**Figure 170: General View of Tumuli and a part of the Corinthian Capital**

*CHA-9 Cemetery*

The area of mention is the current cemetery of the Yolçatı Village. It is located on the edge of the area called Storage Area – 1 (Çeltik) and north of the village. These areas should be considered both in site selection and for construction works. Moreover, it will likely be affected by any of the construction works.

Though no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 171: General View of Cemetery**

*CHA-10 Yolçatı Mound*

A mound, named Yolçatı, was located at a point situated the west of the Tatlı River. It spreads over a wide area and is thought to have been inhabited especially during the Roman/Late Roman period.

Today modern houses occupy the settlement, which has been destroyed a lot by modern building activity. The settlement was originally built on the bedrock and is situated by the river. Pottery fragments were encountered on the surface around the area, which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware were found together with roof tiles.

The site lies towards the north of Yolçatı Village and stands near the river. It is also located in Storage Area – 1 (Çeltik). Settlement area in question should also have a necropolis.



**Figure 172: General View of Yolçatı Mound and Pottery Findings**

*CHA-11 Tumulus*

The tumulus is in the Province of Istanbul, within the borders of the Silivri District and Çantaköy village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.



**Figure 173: General View of Tumulus**

*CHA-12 Cemetery-1*

The area of mention is the current cemetery of the old Germiyan Village. The village used to be a very popular and known place, but today it is in an abandoned state only with 3-4 active households. It is located to the east of the old village. These areas should be taken into account during construction works and site selection. Moreover, it will likely be affected by any of the construction works.

There are many anonymous tombs locations of which had been determined by being surrounded by stones. Germiyan Village is a very old village where Christians and Muslims lived together. Thus, it is not clear which religious community the cemetery belonged to.

Though no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 174: General View of Germiyan Cemetery**

*CHA-13 Mosque*

The area of mention is the current mosque of the old Germiyan Village. The village used to be a very popular and known place, but today it is in an abandoned state only with 3-4 active households. It is located towards the east of the old village. These areas should be taken into account during construction works and site selection. Moreover, it will likely be affected by any of the construction works.

Germiyan Village is a very old village where Christians and Muslims once lived together. In this context, the mosque and church structure are side by side.

The mosque is in a highly damaged condition. It is seen that there are traces of illegal excavations in the inner portions of the building.




**Figure 175: General View of Germiyan Mosque**

*CHA-14 Church*

The area of mention is the current church of the old Germiyan Village. The village used to be a very popular and known place, but today it is in an abandoned state only with 3-4 active households. It is located towards the east of the old village.

Germiyan Village is a very old village where Christians and Muslims once lived together. In this context, the mosque and church structure are side by side.

The mosque is in a highly damaged condition. It is seen that there are traces of illegal excavations in the inner portions of the building together with certain collapses. The entrance was through a passing in between two granite columns.




**Figure 176: General View of Germiyan Church**

*CHA-15 Remains of Old Village*

The area in question surrounds the area related both to Germiyan Village and the remains of buildings from the old village. In general, it is understood that there are certain structures preserved at the foundation level. Remains can be seen from the surface.

*CHA-16 Cemetery-2*

The area of mention is the current cemetery 2 of the old Germiyan Village. The village used to be a very popular and known place, but today it is in an abandoned state only with 3-4 active households. It is located towards the east of the old village.

There are many anonymous tombs locations of which had been determined by being surrounded by stones. Germiyan Village is a very old village where Christians and Muslims lived together. Thus, it is not clear which religious community the cemetery belonged to.

Though no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 177: General View of Germiyan Cemetery**

*CHA-17 Çantaköy Tumulus-1*

The tumulus is located in the Province of Istanbul, within the borders of the Silivri District and Çantaköy Village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

There are illicit digging pits still visible on the tumulus. The tumulus, which is quite high, is among the highest in the region.




**Figure 178: General View of Çantaköy Tumulus-1**

*CHA-18 Çantaköy Tumulus-2*

The tumulus is located in the Province of Istanbul, within the borders of the Silivri District and Çantaköy village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

There are illicit digging pits still visible on the tumulus.




**Figure 179: General View of Çantaköy Tumulus-2**

*CHA-19 Çantaköy Tumulus-3*

The tumulus is in the Province of Istanbul, within the borders of the Silivri District and Çantaköy village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

There are illicit digging pits still visible on the tumulus.




**Figure 180: General View of Çantaköy Tumulus-3**

*CHA-20 Cemetery*

The area of mention is the current cemetery of the Eskiçantaköy Village.




**Figure 181: General View of Cemetery**

*CHA-21 Potential Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Marmaraereğlisi district. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.




**Figure 182: General View of Potential Tumulus**

*CHA-22 Remains of an Old Village*

The area in question is located towards the west of Seymen Village. There are intense pottery fragments visible within the cross-section. The site is interpreted as the location of the ancient settlement pre-dating the village of Seymen.



**Figure 183: General View of Pottery Fragments**

*CHA-23 Cemetery*

The area of mention is the current cemetery of the Türkgücü Village which is located towards the middle of an area named Borrow Pit-2 (Türkgücü).

The tombs from the cemetery reflect the characteristics of modern tombs. However, there are certain anonymous and Early Republican tombs present at the cemetery as well.



**Figure 184: General View of Türkgücü Cemetery**

*CHA-24 Potential Archaeological Site*

It is a mound located in the south of the Türkgücü village. With its location and shape, it gives the impression of a tumulus. However, only a few discoveries of pottery fragments were made during the field investigation.

In this context, it was deemed appropriate to specify it as a potential area.




**Figure 185: General View of Potential Archaeological Site**

*CHA-25 Settlement*

A settlement was located at a point situated the southwest of the Türkgücü neighbourhood. It spreads over a wide area and is thought to have been inhabited in the Late Roman/Byzantine period. The settlement, which did not have much destruction, is well preserved. Many pottery fragments were encountered on the surface all around the area, which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware were found together with roof tiles. The site is located in the southwest of the Türkgücü neighbourhood and by the river. It is located in Borrow Pit-2 (Türkgücü). The settlement area in question should also have a necropolis.




**Figure 186: General View of Archaeological Findings**

*CHA26-Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Marmaraereğlisi District and Yeniçiftlik village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

It is located within the borders of the area named Borrow Pit-2 (Türkgücü)The mound is at a vague height.




**Figure 187: General View of Tumuli**

*CHA-27 Mound*

It is in the Province of Tekirdağ, within the borders of the Çorlu district. Surrounded by 2 rivers from around the north of the Yenice district. The archaeological site is characterized by an intense ceramic repertory on the surface. Based on the findings, it can be suggested that the site was inhabited during both the Hellenistic and Roman periods. Among the surface finds, apart from the ceramics, there are many pieces of roof tiles, pottery pieces etc. On the other hand, the amorphous stones seen at the summit of the hill suggest that they are surfaced architectural elements from buildings.




**Figure 188: General View of Mound and Archaeological Findings**

*CHA-28 Settlement*

A settlement was located at a point situated towards the southwest of the Karatepe neighbourhood. It spreads over a wide area and is thought to have been inhabited during the Late Roman/Byzantine periods.

The settlement, which is a slope settlement, is well preserved. Many pottery fragments were encountered on the surface all around the area, which is thought to be not registered. Fragments belonging to the pottery of daily ware, kitchenware and glazed examples are found together with roof tiles.




**Figure 189: General View of Archaeological Area and Findings**

*CHA-29 Settlement*

A settlement was located at a point situated southwest of the Karatepe neighbourhood. It spreads over a small area and is thought to have been inhabited during the Late Roman/Byzantine periods.

The settlement located next to a riverbed is well preserved. Many pottery fragments were encountered on the surface all around the area, which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware were found together with roof tiles.




**Figure 190: General View of Archaeological Area and Findings**

*CHA-30 Settlement*

A settlement was located at a point situated southwest of the Karatepe neighbourhood. It spreads over a wide area and is thought to have been inhabited during the Late Roman/Byzantine periods. During an excavation realized adjacent to the road, a dense amount of pottery was located at a depth of 1 m on the cross-section. Pottery fragments were encountered on the surface all around the area as well. Even though the pottery might have washed down from another place the current situation favours the existence of the original settlement at this locality. The settlement which is positioned on the slope is well preserved. Many potteries are evident at the site which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware were found together with roof tiles.




**Figure 191: General View of Archaeological Area and Findings**



**Figure 192: The pottery layer is visible on the cross-section**

*CHA-31 Potential Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Çorlu District and Karatepe village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus (Potential). There are other known tumuli in the region.




**Figure 193: General View of Potential Tumulus**

*CHA-32 Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Çorlu District and Sarılar village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

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**Figure 194: General View of Tumulus**

*CHA-33 Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Çorlu District and Sarılar village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.




**Figure 195: General View of Tumulus**

*CHA-34 Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Çorlu District and Sarılar village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

It is located at the edge of the shipping route. It is in a position that is visible from the points of the other tumuli in the region.



**Figure 196: General View of Tumulus**

*CHA-35 Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Çorlu District and Balabanlı village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

It is located at the edge of the shipping route. It is in a position that is visible from the points of the other tumuli in the region.




**Figure 197: General View of Tumulus**

*CHA-36 Cemetary*

The area of mention is the current cemetery of the Balabanlı Village.

Although no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 198: General View of Cemetery**

*CHA-37 Cemetery*

The area of mention is the current cemetery of the Çevrimkaya Village.




**Figure 199: General View of Cemetery**

*CHA-38 Potential Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Çorlu District and Çevrimkaya village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus (Potential). There are other known tumuli in the region.

It is located at the edge of the shipping route.




**Figure 200: General View of Potential Tumulus**

*CHA-39 Settlement*

A settlement was located at a point situated southwest of the Hüsünlü neighbourhood. It spreads over a wide area and is thought to have been inhabited during the Late Roman/Byzantine periods. The site is situated at a nearby location to the riverbed. A road passes in between the parcel on the surface of which some amorphous blocks could be seen. Those blocks are interpreted as belonging to possible constructions. Pottery fragments were encountered on the surface all around the area which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware were found together with roof tiles.

It is located at the north border of the area known as Storage Area-6 (Hüsnülü).




**Figure 201: General View of Settlement and Findings**

*CHA-40 Potential Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Çorlu District and Hüsünlü village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus (potential). There are other known tumuli in the region.

It is located within the area known as Storage Area-6 (Hüsnülü). Only a small amount of pottery could be located on the surface.



**Figure 202: General View of Potential Tumulus**

*CHA-41 Settlement*

A settlement was located at a point situated southwest of the Hüsünlü neighbourhood. It spreads over a small area and is thought to have been inhabited during the Late Roman/Byzantine periods. The site is situated at a nearby location to the riverbed towards the opposite slope of the CHA 39 area. Pottery fragments were encountered on the surface all around the area which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware were found together with roof tiles.

It is located at the north border of the area known as Storage Area-6 (Hüsnülü).




**Figure 203: General View of Settlement and Findings**

*CHA-42 Monumental Tree*

The area of mention is the current cemetery of the Hüsünlü Village. The monumental tree is in the village but at a point which is very close to the transportation route.

The tree in question is considered a monumental tree in accordance with the relevant law with its height, width, and general appearance.[178]




**Figure 204: General View of Monumental Tree**

[178] https://www.csb.gov.tr/anit-agaclar-makale

*CHA-43 Cemetery*

The area of mention is the current cemetery of the Gazioğlu Village. It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village.

It has been observed that there are mainly modern tombs within the cemetery.




**Figure 205: General View of Cemetery**

*CHA-44 Settlement*

A settlement was located at a point situated southwest of the Gazioğlu neighbourhood. It spreads over a small area. It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. The site is thought to have been inhabited during the Late Roman/Byzantine periods. The site is situated at a nearby location to the riverbed. Pottery fragments were encountered on the surface all around the area which is thought to be not registered. Fragments belonging to the pottery of daily ware, kitchenware and green-glazed vessels were found together with roof tiles.





**Figure 206: General View of Settlement and Findings**

*CHA-45 Settlement*

A settlement was located at a point situated southwest of the Gazioğlu neighbourhood. Within a wide area, the current spread limit of the settlement could be detected as nearly every corner of the modern village is with ancient remains/artefacts. Especially the column drums, architectural decorations, fragments of marble basins and column bases point to the possible existence of a church.

It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. The site is thought to have been inhabited during the Late Roman/Byzantine periods. The site is situated at a nearby location to the riverbed. Various architectural elements were encountered on the surface all around the area which is thought to be not registered.




**Figure 207: General View of Findings**

*CHA-46 Cemetery*

The area of mention is the current cemetery of the Köseilyas Village. It is located at the north border of the area known as Storage Area-7 (Köseilyas) and lies towards the east of the village.

It has been observed that there are mainly modern tombs within the cemetery.




**Figure 208: General View of Cemetery**

*CHA-47 Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Süleymanpaşa District and Yenişehir neighbourhood. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

It is located at the north of the area designated as Storage Area-8 (Yenişehir). It is in a position that is visible from the points of the other tumuli in the region.




**Figure 209: General View of Cemetery**

*CHA-48 Cemetery*

The area of mention is the current cemetery of the Yağcı Village.

Although no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 210: General View of Cemetery**

*CHA-49 Mill Remains*

The area in question is to the northeast of the Ottoman village. It is understood that there are 2 building remains on the side of the stream. In general, it is understood that there are structures at the foundation level. Remains can be selected from the surface that might be from the Ottoman/Late Ottoman period.




**Figure 211: General View of Mill Remains and Pottery Fragments**

*CHA-50 Cemetery*

The area of mention is the current cemetery of the Bıyıkali Village.

Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 212: General View of Cemetery**

*CHA-51 Dört Höyük Tepe Tumuli*

The tumulus is in the Province of Tekirdağ, within the borders of the Süleymanpaşa District and Bıyıkali village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

In this location, which is registered as 4 Höyük Tepe (4 Mound Hills) on maps, there are indeed 4 mounds that stand side by side. However, the mounds are not indeed mounds but rather tumuli. Unfortunately, every high hill in Anatolia is called "mound".




**Figure 213: General View of Tumuli**

*CHA-52 Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Süleymanpaşa District and Bıyıkali village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

It lies towards the entrance of the Hacıköy Village. The artificial mound is hardly visible today due to its constant destruction by agricultural ploughing.




**Figure 214: General View of Tumulus**

*CHA-53 Cemetery*

The area of mention is the current cemetery of the Hacılar Village.

It has been observed that there are mainly modern tombs within the cemetery.




**Figure 215: General View of Cemetery**

*CHA-54 Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Süleymanpaşa District and Hacılar village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

It lies towards the entrance of the Hacıköy Village at the edge of the road.




**Figure 216: General View of Tumulus**

*CHA-55 Potential Tumulus*

The tumulus is in the Province of Tekirdağ, within the borders of the Süleymanpaşa District and Seymenli village. The location and general characteristics of the artificial mound, which is located at a very high and dominant point, suggest that it is a tumulus. There are other known tumuli in the region.

It lies towards the north of the Hacıköy Village.




**Figure 217: General View of Potential Tumulus**

*CHA-56 Cemetery*

The area of mention is the current cemetery of the Hacılar Village. It lies towards the south of the Seymenli Village. It is marked due to its location in between multiple facilities.

It has been observed that there are mainly modern tombs within the cemetery.




**Figure 218: General View of Cemetery**

*CHA-57 Ottoman Bath*

The bath was located at a point situated inside of the İnecik town. It is known to be registered under the name İncecik Erenler Bath.

The mention of the historical İnecik Erenler Bath is first found in the records of Uğur Bey Foundation, founded by the son of Saruca Pasha, one of the viziers of the reign of Murat I and Yıldırım Beyazıt. It is known to be built in the first half of the 16$^{th}$ century. İnecik Erenler Bath has partially lost its original plan features by today. The building was built on a single storey stretching to a 130 m$^2$ area on the parcel it is located on.

It is located within the area designated as Concrete Batching Plant-3 and also the village.




**Figure 219: General View of Ottoman Bath**

*CHA-58 Mosque*

The mosque was located at a point situated inside of the İnecik town. It is known to be a registered cultural asset under the name Mirliva Hüseyin Pasha Mosque. Founded on the route of the caravans, İnecik was an important center during the Ottoman Period. Evliya Çelebi mentioned İnecik as being famous with its shops and gives number of households in his "Seyahatname".

Mirliva Hüseyin Pasha Mosque, on the other hand, was built in 1498 and is one of the oldest mosques in Tekirdag. "Mirliva" is a military rank in the Ottoman Empire.

It is located within the area designated as Concrete Batching Plant-3 and also the village.




**Figure 220: General View of Mosque**

*CHA-59 Government Office*

Government Office is located at a point situated inside of the İnecik town. It is known to be a registered cultural asset. The town of İnecik was an important center during the Ottoman Period and thus housed many similarly historical buildings.

It is thought that the building, which has the architectural features of the Ottoman period, was used as a state structure in the Late Ottoman period.

It is located within the area designated as Concrete Batching Plant-3 and also the village.




**Figure 221: General View of Government Office**

*CHA-60 Stone Bridge*

The stone bridge is located at a point at the east of the İnecik town. It is known to be registered. The town of İnecik, which is known to have a very important settlement during the Ottoman period, had such a stone bridge because it is on the ancient road route. It is thought that it was built in the 17$^{th}$ century especially based on the building style. The bridge is made of ashlar blocks and rubble. It has a single round arch in the middle. Both ends are buried under soil.

It is located within the area designated as Concrete Batching Plant-3 and also the village.




**Figure 222: General View of Stone Bridge**

*CHA-61 Settlement*

The settlement was located at a point situated towards the north of the İnecik neighborhood. It spreads over a wide area. The site is thought to have been inhabited during the Late Ottoman period. The site is situated at a nearby location to the riverbed. Certain stones visible on the surface must have belonged to buildings. Pottery fragments were encountered on the surface all around the area which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware found together with roof tiles.




**Figure 223: General View of Settlement**

*CHA-62 Road*

A road was located at a point situated at the southwest of the İnecik neighborhood. It is followed to stretch towards CHA61 as much as seen from the stones visible on the surface. Based on similar examples, these stones are thought to be paving stones. A more detailed examination should be made in the area that is thought to be unregistered.

It is located within the area designated as Concrete Batching Plant-3 and also the village.




**Figure 224: General View of the Road**

*CHA-63 Cemetery*

The area of mention is the current cemetery of the İnecik Village. It is situated at the Concrete Batching Plant-3.

Although no Ottoman-era grave markers with turban could be seen many others that can be dated to the Late Ottoman-Early Republican era were detected.




**Figure 225: General View of Cemetery**

*CHA-64 Mound*

It is in the Province of Tekirdağ, within the borders of the Süleymanpaşa district. Surrounded by river from north. The archaeological site is characterized by an intense ceramic repertory on the surface. Based on the findings, it can be suggested that the site was inhabited during both the Hellenistic, Roman and Byzantian periods. Among the surface finds, apart from the ceramics, there are many pieces of roof tiles, pottery pieces etc. On the other hand, the amorphous stones seen at the summit of the hill suggest that they are surfaced architectural elements from buildings.

It is located within the mid to eastern edge of the area designated as Concrete Batching Plant-3.






**Figure 226: General View of Mound and Pottery Fragments**

*CHA-65 Settlement*

The settlement was located at a point situated towards the east of the İnecik neighbourhood. It spreads over a wide area. The site is thought to have been inhabited during the Late Ottoman period. The site is situated at a nearby location to the riverbed. Certain stones visible on the surface must have belonged to buildings. Pottery fragments were encountered on the surface all around the area which is thought to be not registered. Fragments belonging to the pottery of daily ware and kitchenware found together with roof tiles.

It is located within the area designated as Concrete Batching Plant-3 and also the village.




**Figure 227: General View of the Settlement**

#### 6.3.2.3.4 Intangible Cultural Heritage

##### *6.3.2.3.4.1 General Situation of Türkiye*

Türkiye is a multicultural country. People of Türkiye have consisted of local people and immigrants from the Balkans, Caucasus, Crimea and Central Asia who had settled in the country since the 19th century. The people who came to Türkiye in the late Ottoman period and early Republic period included Muslim immigrants, Turkish-speaking Crimean Tatars and Nogais from the Balkans previously ruled by the Ottomans; Azeris, Uzbeks, Turkmen, Kazakhs, Kyrgyz and other Inner Asian Turkic peoples expelled by the Russian Empire and the USSR, and later the war-torn Turkic Afghans as well as peoples of the North and South Caucasus, such as Circassians, Abkhazians, Dagestanis, Karachay-Balkarla, Chechens and Muslim Georgians. Besides Turkish-speaking immigrants, Bosnians, Pomaks, Albanians, Macedonians, and Greek Muslims, people do not speak Turkish, are also among the immigrants from the Balkans.

Among the local population, Turks are in the majority, including rural and urban Turks, former nomadic Turkmen and semi-nomadic Yoruks. The second main indigenous groups are the Kurds and Zazas who speak western Iranian languages. There are also Laz people who speak a South Caucasian language. Sunni and Nusayri Arabs follow next. The other minorities in Türkiye include non-Muslim Orthodox Greeks, Gregorian and Catholic Armenians, Jews, Assyrians and Chaldeans, and a small number of Molokans (Russian peasants who refuse to obey the Russian Orthodox Patriarchate).

The majority of the population in Türkiye is Muslim (98.8%). There are two main Muslim sects: Sunnis and Alawites. Sunni Turks and Kurds predominate in Türkiye, but Turkish, Kurdish, and Arab Alevis have a significant population (approximately 20% of the total population). Alevi ceremonies are performed in Turkish, whether they are Turkish or not. Although Alawite worship is related to Imam Shia, it differs from regular Shiite doctrine in belief and creed.

In addition to the respect for the formal adaptation of the faith, such as regular mosque or church attendance, the people in Türkiye have also developed beliefs and ceremonial practices based on their local environment, which can be considered the beginning of folk faith. At the centre of such practices is the creation of saints in Christianity, saints (Evliya) in Sunni Islam, or cultural personalities such as "dede" or "ocak" in Alevism. They are accepted by the believers as intermediaries between the folk and the divine power. The tombs or shrines (türbe) of these persons are somehow attributed to certain respective locations where those people had lived at some part of their life or even during their whole life. In addition, the tombs or shrines of others, called Sayyids, who are believed to be descendants of the Prophet Muhammed, are accepted as sacred. Such people, who are believed to be sacred, are buried where they died or had shed blood. Places, where those sacred personalities were buried, are visited by people following their death. People visiting those places generally practice certain forms of worship or prayers in the hope that their wishes will come true. These places are also visited by people during faith fasts and prayers are once realized to these holy people for good deeds to gain merit in the eyes of God. People additionally visit these places for other various reasons: e.g., a woman who cannot give birth prays to have children; to heal a person who is sick; another in distress to overcome difficulties etc. The tombs of these people are then converted into dome-shaped buildings surrounded by rocks to protect them and provide people with a more comfortable environment for prayers/worship.

Sometimes the names or the stories of the people who lie in those localities are forgotten or unknown, but people continue to visit these places, pray, and offer offerings. In some places, graves belonging to forgotten Christian saints or monks were also known to be converted to Muslim saints over time, or people who converted to Islam

continued their beliefs under the cover of traditional Islam. It is sufficient for the person performing these ceremonial practices to know that a holy or saintly person is lying there no matter to which religion he/she belongs.

In some temples and shrines, a vow is made to fulfil a wish. If the wish had become true, the place is visited once again, and an animal is sacrificed to the spirit of the intermediary. Sacrifice meat and other prepared meals are distributed to neighbours but especially to those in need. In some places in Türkiye, tree worship or tree cult practices are also practised. Among them, the most popular practice is to tie a piece of cloth to the tree with the wish.

In addition, religious or non-religious periodic and ceremonial practices exist such as village festivals, pro bono village entertainments, sacrifice, ceremonies (such as circumcision, and baptism), mawlids, Eid (Ramadan and Kurban) and Friday prayers, holy nights (kandil), martyr days and rain prayers. These are the traditions created as an exception from religious celebrations and ceremonies such as festivities, Hıdrellez, Bayram and Friday prayers, and harvest festivals.

Nowruz is celebrated every year on March 21 in the centrums of the settlements or on the fairgrounds. The common practice in Nowruz is jumping over a fire, egg painting and egg competition.

The 32nd General Conference of the United Nations Educational, Scientific and Cultural Organization, whose short name is UNESCO, held in Paris between 29 September and 17 October 2003, adopted the "Convention for the Safeguarding of the Intangible Cultural Heritage" on 17 October 2003. The Convention was accepted unanimously at the session of the Grand National Assembly of Türkiye dated 19.01.2006, under the name “Law on Approval of the Convention for the Protection of Intangible Cultural Heritage” (No: 5448) that was published in the Official Gazette dated 21 January 2006 and numbered 26056 and entered into force in Türkiye. The procedure of becoming a party was completed on 27 March 2006.

There are Intangible Cultural Heritage Lists that were established in accordance with Articles 16, 17 and 18 of the Convention whose names are as follows:

4) Representative List of the Intangible Cultural Heritage of Humanity

5) List of Intangible Cultural Heritage Requiring Urgent Protection

6) A Record of Good Practices in Conservation

The first writings of Türkiye took place with the inclusion of previously announced Masterpieces on the Representative List of Intangible Cultural Heritage within the scope of Article 16 at the Third Ordinary Meeting of the Intergovernmental Committee held in Istanbul in 2008.

As of December 2022, Türkiye has a total of 25 items registered in the Intangible Cultural Heritage List which can be listed as follows:

**Table 147: List of the UNESCO Intangible Cultural Heritage Items from Türkiye**

| Representative List of the Intangible Cultural Heritage of Humanity | |
|---|---|
| 1 | Meddah (Public Storyteller) Tradition (2008) |
| 2 | Mevlevi Whirling (Sema) Ceremonies (2008) |
| 3 | Âşıklık (Bard) Tradition (2009) |

| Representative List of the Intangible Cultural Heritage of Humanity | |
|---|---|
| 4 | Karagöz (2009) |
| 5 | Nowruz (Joint file with Azerbaijan, India, Iran, Kyrgyzstan, Uzbekistan and Pakistan (2009) (in 2016, the file was expanded with the participation of Afghanistan, Azerbaijan, India, Iraq, Iran, Kazakhstan, Kyrgyzstan, Uzbekistan, Pakistan, Tajikistan and Turkmenistan) |
| 6 | Traditional Conversation Meetings (Yaren, Barana, Sıra Nights and others, 2010) |
| 7 | Alevi-Bektashi Whirling Ritual (Semah) (2010) |
| 8 | Kırkpınar Oil Wrestling Festival (2010) |
| 9 | Traditional Ceremonial Keşkek (2011) |
| 10 | Mesir Paste Festival (2012) |
| 11 | Turkish Coffee and Tradition (2013) |
| 12 | Ebru: Turkish Decoration Art of Paper (2014) |
| 13 | The tradition of baking "Thin Bread" and Sharing: referred to as Lavaş, Katrıma, Jupka or Yufka (joint file with Azerbaijan, Iran, Kazakhstan, Kyrgyzstan and Türkiye) (2016) |
| 14 | Traditional Art of Decorated Tile (2016) |
| 15 | Spring Festival Hıdırellez (joint file with Macedonia) (2017) |
| 16 | Dede Korkut-Korkut "the Ancestor" Heritage: Culture, Legends and Music (joint file with Azerbaijan and Kazakhstan, 2018) |
| 17 | Traditional Turkish Archery (2019) |
| 18 | Miniature Art (joint file with Azerbaijan, Iran and Uzbekistan) (2020) |
| 19 | A traditional game of wit and strategy: Togyzqumalaq, Toguz Korgool, Mangala / Gocme (joint file with Kazakhstan and Kyrgyzstan) (2020) |
| 20 | Hüsn-i Hat, Traditional Calligraphy in Islamic Art in Türkiye (2021) |
| 21 | Traditional Ahlat Stonework (2022) |
| 22 | Sericulture and Traditional Production of Silk for Weaving (2022) |
| 23 | Tradition of Nasreddin Hodja / Molla Nesreddin / Molla Ependi / Apendi / Afendi Kozhanasyr / Nasriddin Afandi Anecdotes (2022) |
| 24 | Culture of Çay (tea), A Symbol of Identity, Hospitality and Social Interaction (2022) |
| UNESCO List of Intangible Cultural Heritage Requiring Urgent Protection | |
| 25 | Whistle Language (2017) |

#### 6.3.2.3.4.2 General Situation of the Project Area

Region of Thrace acts as a bridge between the east and the west. In this context, it is possible to come across a wide variety of cultural traces in the region.

The region is like a mosaic that contains both concrete archaeological and cultural assets together with Anatolian and Balkan cultures.

Many practices descending from the past to the present have managed to survive until the present day. Probably the best example of this in the region of Thrace is the historical Kırkpınar Oil Wrestling.

*Historical Kırkpınar Oil Wrestling, date of taking place: June 28th - 4th of July*[179]

'In 1357, during Orhan Gazi's campaigns to seize Rumelia, his son Süleyman Pasha, went on a reconnaissance raid around Edirne with his soldiers right after temporarily seizing Edirne. The vanguard returns and stops at Samona, which is now Greek soil. A total of 40 valiant soldiers wrestles there. Two brothers, whose names are Ali and Selim, commence a never-ending wrestle that lasts for hours as neither one can beat the other. The same couple wrestled again near Ahıköy later, but none of them could win again and in the end die at the location of the competition due to extreme tiredness. Murat Bey, the Ottoman commander who conquered Edirne in 1361, then organized a wrestling ceremony in the summer of the same year in memoriam of the 40 brave raiders who had raided and wrestled at the same location.'

Therefore, organized wrestling goes down in history with the name Kırkpınar Wrestling. After that, it has become a tradition to do Kırkpınar Wrestling every year on the day of Hıdrellez. Historical Kırkpınar Oil Wrestling is known as a great sporting and cultural event that has been passed down from generation to generation for centuries. Kırkpınar developed with the stepping foot of Turks to Rumelia, and today, increased its importance even more with its inclusion in the UNESCO Intangible World Cultural Heritage list as the "Oldest Living Sport" tradition.

*Edirne Kakava (Hıdırellez) Festival, Date: 5th-6th of May*

The belief that the Prophets Hızır and İlyas met at the foot of a rose tree, which is considered one of the important days in the Turkish world, is accepted as one of the most important days that are expected with great excitement and celebrated by making great preparations for the Romans. Hıdrellez and Kakava Festivals, which are considered the harbinger of spring in the Balkans and Edirne, are celebrated in two different locations.

It takes place in Sarayiçi, where Kırkpınar Wrestling is held, and on Saraçlar Street, celebrated with concerts and competition dance performances. The festivities begin with two special rituals to welcome spring on both days. The first step takes place at Sarayiçi and is known as the Kakava Fire, which symbolizes the increase of abundance, and the sharing of beauty. The lighting of this fire is later followed by the offering of rice. The "Prologue to Spring" ritual, aimed at purification and greeting the awakening of nature, takes place on the banks of the Tunca River at 06:00 am in the morning of May. According to the figures for the last year, in addition to the representatives of all Roman associations in Türkiye, local and foreign photographers and thousands of viewers attended the events. Kakava Festivals are closely followed by the world-national press.

[179] https://trakyaotoblog.com/trakya-festivalleri/

*Tekirdağ Cherry Festival, Date of taking place: June 3-6*[180]

Tekirdağ Cherry Festival is among the festivals that come first to mind when the festivals of Thrace are into consideration. This festival is held annually in June. It was first celebrated in 1962 under the name of "Cherry Feast". This name was changed to the more formal "Cherry Festival" in 1964. Nowadays, it is secured as the Cherry Festival and continues its existence by housing cultural and entertainment programs within a wide environment. The festival is held in June, usually in the first or second week with the support of the Mayorship of Tekirdağ. The festival flow includes corteges, parades, shows, exhibitions, night concerts, sailing contests, cherry contests, festival beauty contests, and picnics and ends with closing concerts. Additionally, guests from many countries of the world are known to come and present their own country shows within the scope of the festival.

*Tekirdağ Harvest Festival, date of taking place: 28th of June*

Harvest Festival is a traditional organization that is sponsored and organized by the Tekirdağ Metropolitan Municipality that was held every year in the Çorlu District of Tekirdağ. It generally takes place within the last days of June.

*Vine-Harvest Festival of Thrace, date of taking place: September*

Organized by Süleymanpaşa Municipality in Tekirdağ, the "Vine-Harvest and Ecology Festival" begins with the opening ceremony held at the Viticulture Research Institute (Bağcılık Araştırma Enstitüsü). During the festival, about 90 different varieties of grapes that were grown in Tekirdağ are offered to the guests. It is possible to visit the exhibitions consisting of local hand-wovens and various ornamental products made by Karacakılavuz women that are exhibited in the coastal embankment area. Different concerts by famous artists are held every night.

#### 6.3.2.3.4.3 General Evaluation

The Project Site is in a region where agricultural and industrial production together with animal husbandry continues and especially the growing of fruits (grape, etc.) and sunflower cultivation is densely realized. In June, the time when the field studies were carried out, crops in the region had not been harvested yet, and the fields were full of plants and various agricultural products.

Both the regions of Thrace and Marmara are provinces where agricultural production and industrial activities are intertwined. Thrace is a geographical centre of attraction for many since it houses a strong industry in the region, arable lands, and irrigation facilities.

The region is home to communities that have migrated to the region especially from the Balkan countries in the latest periods of the Ottoman Empire and occasionally settled in the region (which are called "muhacir"). In addition to the habitation models like villages and towns, there are many idle settlements or summer houses due to the proximity of the region to metropolises such as Istanbul and Edirne.

According to the observations and research, the following inferences are obtained:

- Local people depend on their traditions,
- There are various festivals held at the time of harvest depending on agricultural production,
- The festivals are not held only for promoting the products obtained, but also for activities where people come together, socialize, and spend time together.

[180] https://www.suleymanpasa.bel.tr/kategori/festivaller

- Communities, that stick to their ethnic identities and still live their traditions.
- It is necessary to reveal these elements during household surveys that will be conducted in the region.

# 7.0 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

## 7.1 Physical Component

### 7.1.1 Geology and Geomorphology

Based on the information currently collected, and since there will be no blasting activity in the Project (blasting will be done for quarries only) and no tunnel or viaduct construction is planned, the geology and geomorphology component has been assigned a **medium-low** sensitivity value.

#### *7.1.1.1 Impact Analysis*

##### 7.1.1.1.1 Construction Phase

During the construction phase, impacts will be mainly associated to the following ***impact factor*:**

- Changes in the local morphology

The ***project actions*** related to the abovementioned impact factor are the following:

- surface levelling and grading (including dismantling of existing structures),
- temporary stockpiling of material, and
- construction of the motorway and service facilities and associated facilities (herein after referred as “construction of the facilities”).

Additional impacts on geology and geomorphology also related to soil, hydrology, and hydrogeology and these are discussed in the relevant sections of this ESIA.

The impact is mainly related to the changes inflicted on the current morphology of the area due to the earthworks and excavations, and for the site preparation (scarified, excavated, filled with proper material, and flattened) and the construction of the structures’ foundations.

##### 7.1.1.1.2 Operation Phase

As a result of the impact screening, no impacts on the geology and the geomorphological components are expected during the operation phase.

##### 7.1.1.1.3 Decommissioning and Closure Phase

The decommissioning activities would comprise the removal of the Project Components and the associated facilities. Also, the foundations of the structures would be removed. The site is expected to be restored for its future use.

As a result of the impact screening, no impacts on the geology and the geomorphological components are expected during the decommissioning and closure phase. Decommissioning of infrastructures could have a positive impact if the natural state of the land is recovered.

#### *7.1.1.2 Mitigation Measures*

The mitigation measures, for the impacts on the geology and geomorphology are listed below for the construction phase:

- Detailed studies on geological and geotechnical components (including seismicity) will be completed for the Project before the construction phase;
- Worksite will be minimized to the smallest extent possible in order to meet Project’s works and activities;

- Construction site will be minimized to the smallest extent possible in order to meet Project's works and activities;
- The foundations' footprints and depths have been properly dimensioned; hence the excavations and the consequent physical-mechanical disturbances will be minimized;
- The flattening and excavation operation will be minimized to the extent possible in order to limit the morphological disturbances;
- Part of the removed material will be re-used as a fill material at the Project Area, if it presents the suitable geotechnical characteristics, in order to limit the use of raw material;
- Quarries and Associated Facilities Management Plan is already developed and implemented for Malkara-Çanakkale Motorway Project by ÇOK A.Ş.. This will be reviewed and revised according to the Project Standards, updated and made Project specific and will be implemented for the Project to ensure that identified impacts and risks are managed;
- Several structures will be developed/revised as part of the changes in the Project, and these will all be designed according to Turkish and international design standards (requiring specific structural characteristics related to slopes of cuts and fills and many other considerations);
- Soil Erosion, Reinstatement and Landscape Management Plan is already developed and implemented for Malkara-Çanakkale Motorway Project by ÇOK A.Ş.. This will be reviewed and revised according to the Project Standards, updated and made Project specific and will be implemented for the Project to ensure that identified impacts and risks are managed.

### *7.1.1.3 Residual Impacts*

#### 7.1.1.3.1 Construction Phase

The residual impact on the geology and geomorphology component after the implementation of the above-mentioned mitigation measures during construction phase is presented in the following table.

Based on the baseline conditions of the assessed components, the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **low negative impact** is expected on the geology and geomorphology component during the construction phase.

**Table 148: Impact Assessment Matrix for Geology and Geomorphology During Construction Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Changes in the local morphology | Duration: | Medium | Medium-low | Long term | **Low** | Medium | **Low** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.1.3.2 Operation Phase

As stated before, as a result of the impact screening, no impacts are expected on the geology and geomorphology component during the commissioning and operation phase.

- Quarries and Associated Facilities Management Plan will be implemented as per the regulatory requirements if the quarries will be closed after the construction phase of the Project.

- EPC Contractor will ensure that the associated facilities and rented areas used for construction activities are restored according to the specifications of each area. This restoration will adhere to the agreements made with the relevant authorities (i.e. Rehabilitation Plans) or as per the written agreements with the landowners (i.e. Contracts for the Rental Land).

#### 7.1.1.3.3 Decommissioning and Closure Phase

As stated before, as a result of the impact screening, no impacts on the geology and the geomorphological components are expected during the decommissioning and closure phase.

### *7.1.1.4 Monitoring*

No specific monitoring activities are required for this component. As needed within the appropriate timeframe the following will be continued to be implemented as:

- Rehabilitation plans will be prepared for the quarries as per the regulatory requirements.
- Excess excavation material storage areas will be rehabilitated as per the regulatory requirements.

## 7.1.2 Geohazard and Seismology

### *7.1.2.1 Impact Analysis*

The definitions of these impact factors were presented below:

- Rockslides/rockfalls that rock slope excavations: These will be localized and will need to be mitigated through detailed site geology information gathering, and assessment of rockslides and rockfalls based on the construction activities.
- Seismic activity: The Project Area is within a seismically active area. According to AFAD, the maximum peak ground acceleration (PGA) value near the Project Area with 475 years return period is defined as approximately 0.309 g. The design and construction activities will be conducted in accordance with the geological structure.
- Landslides and Subsidence: According to the national landslide maps prepared by the Mineral Research and Exploration in 2005, there are many landslides, paleo-landslides and soft clay movement around the Project Route. According to the 1/25,000 scaled maps, general lateral movements have been detected near the 40th-kilometre access road , and active landslide areas near the 70th-kilometre access road. On the other hand, in the Project AoI, there is no geological unit which could cause subsidence.

During all Project phases, impacts (increase in the impacts of natural disasters) will be mainly associated to the following ***impact factor***.

- Changes in the local morphology (changes inflicted on the current morphology of the area), and
- Occupation of land (occupation of land mainly related to presence of the new facilities (such as motorway, service stations and toll plazas) and presence of Project structures (culverts etc.) this will increase the artificial surfaces).

The **project actions** related to the abovementioned impact factors are the following:

- surface levelling and grading (including dismantling of existing structures),
- temporary stockpiling of material,
- construction of the motorway and associated facilities,

- operation of motorway including the maintenance activities; and
- disposal of waste deriving from operation.

### 7.1.2.2 Mitigation Measures

The mitigation measures of the impacts caused by the natural hazard and seismology component on the Project are listed below:

- Before and during the construction activities of the Project, the provisions of “Türkiye Building Earthquake Regulation” (OG Number: 30364 Date: 18.03.2018) will be complied with.
- Detailed investigations will be conducted for assessing the stability conditions for the structural elements for both normal operation loads and under seismic loads. Türkiye Building Earthquake Regulation requires certain parameters to be determined prior to the construction. These parameters were determined by the geological and geotechnical investigations of the Project Area.
- Several structures will be developed as part of the proposed motorway (culverts, overpasses etc) and these will all be designed according to Turkish and international design standards requiring specific structural characteristics related to slopes of cuts and fills, footing sizes and many other considerations.
- Related studies (geological, geotechnical and hydrological studies etc.) will be completed for the Project before the construction phase.

### 7.1.2.3 Residual Impacts

The residual impact on the Geohazard and Seismology component after the implementation of the above-mentioned mitigation measures during all project phases is presented in the following table.

**Table 149: Impact Assessment Matrix for Natural Hazard and Seismology After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Changes in the local morphology | Duration: | Short | Medium | Long term | **Low** | Medium | **Low** |
| | Frequency: | Single Event | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |
| Occupation of land | Duration: | Very long | Medium-low | Long term | **Medium** | Medium | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project Site | | | | | |
| | Intensity: | Medium | | | | | |

### 7.1.2.4 Monitoring

Following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- Routine site inspections will be carried out by EPC Contractor Earthworks Department in collaboration with Survey Department to ensure that the planned construction site boundaries are not expanded.
- Routine design inspections will be carried in order to ensure structures are constructed according to Turkish and international design standards requiring specific structural characteristics related to slopes of cuts and fills, footing sizes of viaducts and many other considerations.

### 7.1.3 Soil and Subsoil

Based on the information collected in the baseline (Chapter 6.1.5), the soil and subsoil component has been assigned a **medium-low to medium** value of sensitivity.

#### *7.1.3.1 Impact Analysis*

##### 7.1.3.1.1 Construction Phase

During the construction phase, impacts on the soil and subsoil component will be mainly associated to the following **impact factors**:

- Topsoil/soil removal,
- Pollutant emission to the soil, and
- Occupation of land.

The **project actions** related to the abovementioned impact factors are the following:

- surface levelling and grading,
- temporary stockpiling of material,
- transportation of construction materials,
- construction of the facilities, and
- disposal of waste deriving from construction (including excavated soil).

All the impact factors identified above are assessed below for the construction phase.

**Topsoil/soil removal**

Construction activities will include the excavation and removal of both topsoil and subsoil. The plan is to reuse the excavated material as much as possible, whenever it is technically feasible.

**Pollutant emission to the soil**

Potential pollutant emissions to the soil can be caused by;

- Accidental spills of any chemicals or hazardous materials used during construction;
- Runoff from refuelling and vehicle/equipment washing areas (particularly where paving and covers are absent);
- Pollution from the temporary storage of hazardous materials and/or wastes;
- Accidental leaks or spills from septic tanks;
- Accidental leaks, spills, and runoff from waste storage areas (especially hazardous waste storage areas); and
- Emissions from truck traffic and the transport of construction materials and excavated materials.

**Occupation of land**

Occupation of land resulting from the construction of associated facilities such as camp sites, stores and service facilities.

#### 7.1.3.1.2 Operation Phase

During the operation phase, impacts on the soil and subsoil component will be mainly associated to the following **impact factors**:

- Pollutant emission to the soil, and
- Occupation of land.

The **project actions** related to the abovementioned impact factors are the following:

- operation of motorway and service facilities including the maintenance activities, and
- disposal of waste deriving from operation.

**Pollutant emission to the soil**

Potential pollutant emissions to the soil can be caused by;

- Accidental spills of any chemicals or hazardous materials used during routine operation and maintenance works;
- Runoff from petroleum retailers and vehicle washing areas to be located in motorway service facilities (particularly where paving and covers are absent);
- Pollution from the temporary storage of hazardous materials and/or wastes;
- Accidental leaks or spills from salt depots;
- Accidental leaks or spills from septic tanks, which will be potentially located at toll plazas and motorway service facilities,
- Accidental leaks, spills, and runoff from waste storage areas (especially hazardous waste storage areas); and
- Accidental leaks or spills from traffic accidents.

**Occupation of land**

The occupation of land will primarily result from the introduction of new infrastructure, such as the motorway, service facilities, and switchyard, leading to an increase in artificial surfaces.

#### 7.1.3.1.3 Decommissioning and Closure Phase

The impacts during the decommissioning phase are expected to be similar to those during the construction phase due to the comparable nature of the activities involved. Heavy trucks will generate soil pollutants, much like during construction and accidental spills may occur due to during dismantling activities.

At the end of the decommissioning phase, restoring the soil in areas previously occupied by buildings and infrastructure could have a generally positive effect on the soil and subsoil. Unlike the construction phase, the factors such as topsoil and subsoil removal and land occupation will not be relevant during decommissioning. For restoration activities, it may be necessary to import soil from outside the Project Area. If this occurs, the transportation and importation of polluted soil would be considered a negative impact. To prevent such issues, related mitigation measures, such as soil quality assessment before transporting soil from external sources (as listed in the next section), should be implemented.

### 7.1.3.2 Mitigation Measures

The mitigation measures for the construction, the commissioning/operation and decommissioning/closure phase are as follow:

Measures incorporated in the Project Design:

- worksite will be minimized to the smallest extent possible in order to meet Project's works and activities;
- the foundations' footprints and depths have been properly dimensioned; hence the excavations and the consequent physical-mechanical disturbances will be minimized;
- excavations and soil abstractions will be minimized as much as possible, taking into account the need to meet building design and construction requirements;
- part of the removed/excavated material will be re-used as a filling material, when technically feasible, and this will limit the use of raw material;
- the best available techniques will be employed to maximize the re-use of soil (cut) and minimize the amount of imported topsoil (fill). A Soil and Topsoil Management Plan will be prepared and implemented for the Project. This approach to maximizing the re-use of soil and minimizing imported topsoil will be presented and monitored through the Soil and Topsoil Management Plan, which will define the strategies, actions, and monitoring procedures, ensuring the effective implementation of these strategies.
- hazardous material storage areas (chemical storage areas, chemical and oil/fuel storage tanks etc.) will be designed and constructed to present any spill to the soil and to avoid potential contamination into the soil;
- appropriate treatment-spill control systems will be placed (where relevant) in water crossings, fresh water sources and protected areas where surface runoff may adversely affect soil, surface water and ground water media;
- the temporary waste storage areas will be constructed based on the requirements listed in the Regulation on Landfilling of Wastes issued on March 26, 2010, at Official Gazette no:27533 and Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314;

General mitigation measures:

- Soil and Topsoil Management Plan will be prepared and implemented for the Project;
- Hazardous Materials Management Plan will be prepared and implemented for the Project;
- Resource Efficiency and Pollution Prevention Plan will be prepared and implemented for the Project;
- Emergency Response Plan (ERP) (including spill response activities) will be prepared and implemented for the Project;
- Quarries and Associated Facilities Management Plan is already developed and implemented for Malkara-Çanakkale Motorway Project by ÇOK A.Ş.. This will be reviewed and revised according to the Project Standards, updated and made Project specific and will be implemented for the Project to ensure that identified impacts and risks are managed;
- Soil Erosion, Reinstatement and Landscape Management Plan is already developed and implemented for Malkara-Çanakkale Motorway Project by ÇOK A.Ş.. This will be reviewed and revised according to the Project Standards, updated and made Project specific and will be implemented for the Project to ensure that identified impacts and risks are managed;

- The Pesticide and Herbicide Management Plan will be developed as part of the Project's ESMS to evaluate risks and propose mitigation measures for the use of pesticides and herbicides throughout both the construction and operation phases;
- During the detailed design phase, the Ground Investigation will include a greater number of samples (100-200m sampling frequency for a linear site) in accordance with European guidelines, to draw meaningful conclusions regarding the risk of soil contamination. The future Ground Investigation should include an appropriate amount of sampling and testing from potentially contaminative sites, such as the Terkin Merkezi Business Park, as well as other sites of interest identified through a review of historical land use.
- the Project will comply with relevant legal and project safety requirements to avoid leakages from hazardous materials storage areas on-site;
- regular maintenance of vehicles and machinery/equipment will be undertaken to ensure that leakages of hazardous material are prevented;
- use of machinery/vehicles will be strictly limited within the construction sites and along the appropriate access roads;
- impervious (concrete etc.) surfaces will be designated for the refuelling of the machinery/vehicles, if it is not possible according to the nature of the Project, all refuelling tankers and all heavy machinery used at the Site will have an iron plate trays, and these trays will be placed under the pipe connection points to prevent accidental leakage to the soil during refuelling operations;
- maintenance of the vehicles and machinery/equipment (if needed) will be conducted in designated area where there is impermeable surface (concrete floor etc.) and if needed secondary containment system will be present;
- portable spill containment and clean-up materials will be made available and easily accessible at the construction site, instructions on how to use spill containment and clean-up materials will be included in the kits;
- training on spill response, use of containment and clean-up material (spill kits) will be provided to workers (including the subcontractor workers);
- adequate and properly maintained tanks, paved ground, spill containment materials and proper secondary containment systems with sufficient volume will be provided for fuel/oil storage and for the storage of other fluids and hazardous substances to prevent loss into the soil;
- wastewater flows from the Project activities will be properly managed;
- polluted water will be properly collected or managed to prevent the soil pollution; and
- if some vegetated/uncontaminated land is expected to be permanently removed (e.g. onto the new buildings' footprints and the roads), the topsoil should be properly stored (as required by the Regulation on Excavation, Construction and Demolition Wastes issued on March 18, 2004 at Official Gazette no.25406) and re-used for reclamation of nearby artificial sites:
    - Separate Collection of Topsoil: During excavation, topsoil will be collected separately from subsoil. It will be excavated based on its depth and composition and then piled for reuse.
    - Storage Site Requirements: The site where topsoil will be stored should have a slope of no more than 5%. The coordinates of the temporary storage site(s) should be determined by the EPC Contractor Survey Department prior to any activity on site, shared with Earthworks Department and/or potential

earthworks subcontractor, and the relevant teams should monitor the site during the entire construction phase until the temporarily stored topsoil will be reused for landscaping purposes.

- Prevention of Topsoil Losses: Measures will be taken to prevent any losses and to maintain the quality of the topsoil during storage.
- Protection of Stored Topsoil: If the topsoil will be left exposed for an extended period, it will be covered with fast-growing vegetation to protect it.
- Reuse of Topsoil: The separately collected topsoil will be reused in parks, gardens, green spaces, agricultural activities, and similar projects.

Specific mitigation measures for contaminated soil:

- A pre-construction survey will be conducted before any fieldwork begins to identify potential contamination early. EPC Contractor will complete these surveys prior to site activities, allowing for a proactive approach to manage and mitigate contamination in collaboration with authorities. The survey will include visual inspections and, if needed, soil sampling and analysis for suspected contamination.
- if soil contamination is suspected during construction related excavation, a detailed assessment should be conducted in order to determine if there are any contaminants sources present within the site or in the near vicinity and the provisions of “Regulation on Soil Pollution Control and Point Source Contaminated Sites (Official Gazette Date: 08.06.2010, Number: 27605)“ should be implemented;
- in case that results of a soil assessment show the compliance with site-specific soil quality limits set by the regulation (reference soil samplings can be carried out to determine the site specific limit values), materials coming from levelling activities could be excavated, transported, and used in the construction of embankments and/or backfill, after an assessment;
- Soil quality investigation and remediation is regulated by the MoEUCC in accordance with the Soil Pollution Control and Sites Polluted by Point Source Contamination Regulation” (“Soil Pollution Regulation). If the soil is contaminated, it is recommended to work with the local regulatory agencies to select solutions for treatment or disposal, follow the provision of the abovementioned regulation and in general to follow a standard practice. Remediation strategy of any contaminated site should be presented to PDoEUCC and approved by related authorities;
- avoid or minimize temporary stockpiling of contaminated soils or hazardous material; and
- isolate the stockpile with impermeable liner or tarps, install a berm around the stockpile to prevent runoff, from leaving the area, do not stockpile in or near storm drains or water bodies or unconfined aquifer zones with high groundwater elevation if temporary stockpiling is necessary;

Specific measures will be taken before and during the construction activities at those potential contaminated sites (and any other sites suspected during construction activities);

- A pre-construction survey will be conducted for each area where construction (or pre-construction) activities are to begin, involving visual observation at the site before construction work starts. Pre-construction survey forms will be filled out, and if contaminated soil is suspected, this will be detailed in the forms. The need for sampling will be specified and communicated to the relevant Project Responsible.
- Construction workers (including managers and supervisors) will be trained to recognize signs of contamination during earthworks.

- The decision to conduct a human health risk assessment will be made on a case-by-case basis. If soil sampling is conducted, the results will be evaluated based on human health risks, potential sources of ground gas and vapor, and environmental risks.
- The necessity of a human health risk assessment will be determined, and authorities will be consulted when necessary. Such assessments help experts evaluate the overall situation and determine the necessary advice or actions to protect human health.
- A methodology for dealing with contaminated soil will be established. Occupational Health and Safety (OHS) rules will be defined and followed when handling contaminated soil. Standard Operating Procedures (SoPs) will be prepared for all activities involving contaminated soil.

### *7.1.3.3 Residual Impacts*

#### 7.1.3.3.1 Construction Phase

The residual impact following above mentioned mitigation measures during construction phase is presented in the following table (Table 150).

Based on the baseline conditions of the assessed components, the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **negligible to low negative impact** is expected on the soil and subsoil component during the construction phase.

**Table 150: Impact Assessment Matrix for Soil and Subsoil Component During Construction Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Topsoil/soil removal | Duration: | Medium | Medium | Mid term | **Medium** | Medium | **Low** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Project Site | | | | | |
| | Intensity: | Medium | | | | | |
| Pollutant emission to the soil | Duration: | Medium | Medium | Short-mid-term | **Low** | Medium high | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Occupation of land | Duration: | Medium | Medium-low | Mid term | **Low** | Medium-low | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project Site | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.3.3.2 Operation Phase

The residual impact on the soil and subsoil component after the implementation of the abovementioned mitigation measures during operation phase is presented in the following table (Table 151).

Based on the baseline conditions of the assessed components, the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **low negative impact** is expected on the soil and subsoil component during the operation phase.

**Table 151: Impact Assessment Matrix for Soil and Subsoil Component During Operation Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Pollutant emission to the soil | Duration: | Very long | Medium | Mid term | **Medium** | Medium | **Low** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Project Site | | | | | |
| | Intensity: | Medium | | | | | |
| Occupation of land | Duration: | Very long | Medium-low | Long term | **Medium** | Medium | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project Site | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.3.3.3 Decommissioning and Closure Phase

At the end of the decommissioning phase, the soil restoration in the areas, once occupied by buildings and infrastructures might have an overall **positive impact** on the component if the natural state of the land is recovered.

### *7.1.3.4 Monitoring*

Following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- Pre-construction surveys will be conducted within a reasonable time frame before any site setup and preparation based on the pre-construction survey procedure implemented for Malkara-Çanakkale Motorway Project by EPC Contractor.
- Routine site inspections will be carried out to ensure that the planned construction site boundaries are not expanded.
- Routine site inspections will be carried out to ensure adequate amount of spill-response material such as spill-kits and metal trays will be present at the site, in each waste storage and hazardous material storage areas and in each heavy machinery.
- Routine maintenance programme will be set-up for all vehicles and machinery/equipment.
- Routine visual inspections will be carried for the top soil storage areas in order to ensure the requirements of the Regulation on Excavation, Construction and Demolition Wastes is followed.
- Routine site inspections and routine visual inspections will be carried for the waste storage areas and hazardous material storage areas in order to identify any possible leakages.
- Soil quality measurements will be conducted if any complaint received from local community and/or authorities, and the result will be compared with the baseline measurement conducted in the scope of ESIA.
- Project activities will be monitored according to Soil Erosion, Reinstatement and Landscape Management Plan of the Malkara-Çanakkale Motorway Project (will be revised and implemented for the Project).

Specific monitoring requirements:

- Soil quality studies will be conducted at the sites designated for leasing to petroleum retailers at Motorway Service Areas prior to finalizing lease agreements. Sampling locations will be strategically chosen based

on the area that the retailer will occupy. This will include ensuring that both underground and aboveground petroleum product tank locations are comprehensively covered by the assessment.

- If there is a fuel station at the Operation and Maintenance Centers (OMC) to be handed over to the O&M Subcontractor, soil analysis will be conducted prior to delivery, and it will be ensured that the areas are clean.

### 7.1.4 Hydrology and Surface Water Quality

Based on the information collected in the baseline (see Chapter 6.1.6), the hydrology and surface water quality component has been assigned a **medium-low to medium** value of sensitivity due to the presence of waterbodies in AoI, water/sediment pollution and presence of hydrological changes in sub-catchments of creeks in the AoI.

#### *7.1.4.1 Impact Analysis*

##### 7.1.4.1.1 Construction Phase

The impact factors from the Project activities potentially affecting the surface water quality and quantity during the construction phase of the Project will mainly be originated from the operations that have the potential to pollute surface water, either intentionally or accidentally, or that cause changes in flow/circulation in natural water bodies.

Impacts on the hydrology and surface water quality component during the construction phase are related to the following **impact factors**:

- Changes in flow/circulation in natural water bodies (changes in local hydrology and surface water),
- Surface water pollution, and
- Discharge of wastewater/water.

The **Project actions** related to the abovementioned impact factor are the following:

- Surface levelling and grading (including dismantling of existing structures),
- Temporary stockpiling of material,
- Construction of the associated facilities,
- Operation of associated facilities during construction, and
- Disposal of waste deriving from construction (including excavated soil).

**Changes in flow/circulation in natural water bodies (changes in local hydrology and surface water)**

- A major influence from construction is the diversion of natural drainage. Engineering activities associated with quarrying can directly change the course of surface water.
- The use of surface water resources for the construction process such as dust suppression directly affects surface water resources negatively in terms of quantity.
- Construction of the motorway, service facilities and associated facilities such as culverts and diversion channels can impede flow during times of flood, thus causing water levels upstream of structures to be raised above what would occur in the absence of the structure, as well as it leads to disturbance of natural surface water flow paths and accelerates erosion.

- Changes in surface water runoff patterns due to changes in surface characteristics and topography could affect the flood hazard, which may impact the integrity and operational aspects of existing natural or man-made flood defences.
- Additionally, changes in runoff characteristics may vary the volume/rate/timing of discharges to watercourses resulting in adverse impacts from changes in environmental, social and biodiversity settings.
- If not properly controlled, suspended sediments in surface run-off could change not only surface run-off, but also natural sedimentation patterns, which will lead to more pollution.

**Surface water pollution**

- Silty/soiled water from excavations (e.g. cut and fill), exposed ground, stockpiles of soil, quarries, topsoil placing and excess material, plant and wheel washings, washing of finished road surfaces to remove accumulated soil and disturbance of drains and streambeds (i.e. in-stream construction of culverts and channel diversions/improvement works), and landscaping e.g. of road embankments could induce the release of pollutants if it is not properly managed.
- If a construction site or a refuelling and storage depot is located near a surface water body, the surface water is at risk from the spill of hazardous substances. For instance, liquid cement (and associated wastewater run-off), due to its high alkalinity and corrosive nature, is highly polluting and can give rise to major fish kills in aquatic environments. The accidental spillage of cement can have significant water quality consequences for watercourses, aquatic ecology and downstream users as well as other pollutants such as fuel, oils and lubricants.
- If not properly managed, the temporary storage of waste and hazardous materials from construction activities could lead to the release of contaminants into the surface and groundwater. Contaminant leakage into water bodies could primarily occur due to runoff from areas near freshwater sources that have experienced:
  - Oil and fuel leaks from vehicles and generators;
  - Accidental spills of hazardous materials used during construction;
  - Runoff from areas where chemicals, oil, and fuel are temporarily stored (particularly where there is no paving or secondary containment);
  - Pollution from the temporary storage of hazardous materials and waste;
  - Disposal of waste and wastewater; and
  - Accidental spills of wastewater.

Chemical contamination of freshwater can adversely affect surface water quality in various ways, depending on the type and concentration of the contaminant. Accidental spills of cement, fuel, oils, and lubricants can significantly impact water quality, affecting watercourses, aquatic ecosystems, and downstream users. Additionally, if surface water is contaminated, groundwater can rapidly become polluted as well.

Despite the potential for severe impacts, this factor is expected to be infrequent and of low intensity. Consequently, spills, leaks, and accidental discharges would need to originate from within the Project footprint or associated facilities, which are generally located at a considerable distance from nearby water bodies.

**Discharge of wastewater/water**

It is assumed that domestic water to be used by the Project personnel will be converted to domestic wastewater. Wastewater discharge volume was estimated as 660 $m^3$ per day calculated according to 3,300 workers.

Wastewaters will be generated at the construction sites and camps sites due to water consumption of the personnel. For domestic wastewater generated by operation of the associated facilities, it is foreseen that, if possible, wastewater can be connected to the local/municipal sewage network which should be ended with proper wastewater treatment facility sustains the discharge quality standards. Otherwise, package wastewater treatment plant (WWTP) with domestic wastewater collection system will be established or generated domestic wastewaters will be collected in portable leak-proof quality septic tanks and wastewaters then will be transport by a licenced contractor to a nearest licensed wastewater treatment facility which sustains the discharge requirements. With the commissioning of WWTPs, treated wastewaters, which will be treated in accordance with the Project Standards defined in the Appendix A, will be discharged to the receiving environment in line with the environmental permits to be obtained from the PDoEUCC under the Regulation on Environmental Permits and Licences.

For the dust emission raising from the construction activities, sprinkler (water truck) will be used. 40 $m^3$/day water is estimated to be used for the dust suppression during the construction phase. No wastewater generation is expected as a result from dust suppression activities, since the water to be used for dust suppression activities is expected to evaporate.

No wastewater generation is expected during the concrete production process as the settled wastewater is recirculated to concrete production process.

Wastewater generation from construction accommodations may impact surface water quality. All wastewater from these compounds poses a risk to the water environment if not treated prior to discharge (either by on-site treatment or removal for disposal via the local sewage network, if available).

#### 7.1.4.1.2 Operation Phase

Impacts during the operation phase are likely to be the same as the construction phase hence the activities will be similar to construction activities related to the following ***impact factors***:

- Surface water pollution,
- Pollution to Surface Water Bodies from Rainwater Runoff,
- Discharge of wastewater/water, and
- Changes in surface run-off patterns.

**Project actions** for the operation phase are similar to those for the construction phase, including:

- Operation of motorway and service facilities including the maintenance activities,
- Wastewater generation, disposal of waste derived from operation (domestic wastes, hazardous wastes from maintenance works), and accidental spills, which are detailed in the previous section (construction phase),
- Disposal of wastewater, and
- Presence of the facilities.

All the impact factors identified above are assessed below for the operation phase.

**Surface water pollution**

The details related to this Project impact are detailed in the previous section (construction phase).

**Pollution to Surface Water Bodies from Rainwater Runoff**

Rainwater runoff from the motorway can lead to the pollution of nearby surface water bodies, particularly when the runoff carries contaminants such as oils, tire residues, and other pollutants from vehicle traffic. These contaminants can include fuel residues, lubricants, heavy metals from vehicle exhaust, and various particulate matter. If not properly managed, such runoff can significantly degrade water quality.

Runoff from the road surface, especially during rainstorms, may wash off these pollutants, which can accumulate over time due to ongoing vehicle traffic. Oil residues, in particular, pose a serious risk to aquatic life, as even small amounts can harm fish, plants, and other organisms. Heavy metals, such as lead, zinc, and copper, which are commonly found in vehicle exhaust, can also contaminate surface water, leading to long-term ecological effects, including reduced biodiversity and water quality.

Additionally, debris such as litter, plastic particles, and other solid waste can be carried by rainwater runoff, further contributing to surface water pollution. If road maintenance, cleaning, and drainage systems are not properly managed, this pollution risk can be heightened, especially in areas where drainage systems are inadequate or where stormwater runoff is directly discharged into nearby water bodies without treatment.

Proper drainage systems, regular maintenance, and the implementation of water management measures such as filtration or sedimentation ponds can help mitigate the pollution risks from rainwater runoff, ensuring that surface water bodies are protected from contamination.

**Discharge of Wastewater/Water**

The details related to this Project impact are detailed in the previous section (construction phase).

**Changes in surface run-off patterns**

Presence of motorway, service facilities, and associated facilities such as culverts and diversion channels can led to changes in surface run-off patterns.

#### 7.1.4.1.3 Decommissioning and Closure Phase

The decommissioning phase impacts will be similar to both the construction and operation phases, so the activities will be similar to these activities. The same considerations described for this component during the construction phase would be applicable to the decommissioning phase.

A new impact is not expected during the decommissioning and closure phase of the Project, other than those listed in the construction and operation phases.

### *7.1.4.2 Mitigation Measures*

The mitigation measures related to hydrology and surface water quality for the construction, commissioning/operation and decommissioning/closure phases are as follows:

Incorporated measures in the project design:

- The Project's river and stream crossings has to be assessed for 100-year and 500-year floods[181], and appropriate sizing of culverts and crossings will be decided. Flood risk assessment reports (with proposed drainage structures) will be prepared for the Project and fully implemented.
- A supplemental assessment of stormwater drainage risks to the environment has to be undertaken to verify the stormwater drainage designs' effectiveness in mitigating impacts on surrounding land use, surface and groundwater or sensitive ecological receptors therein.
- The project will comply with safety requirements to avoid leakages from hazardous chemicals/materials and liquids (diesel fuel, oil etc.) stored on-site.
- Hazardous material storage areas (including where the diesel/fuel storage tanks are located), will be designed and constructed to avoid potential contamination of the soil (paved areas with sufficient secondary containment, proper drainage systems, collection ponds etc.).
- The temporary waste storage areas will be constructed based on the requirements listed in "Regulation on Regular Storage of Wastes" issued on *Official Gazette* No:27533, Dated: 26/03/2010 (Amended: OG-24/06/2022-31876) and "Regulation on Waste Management" issued on *Official Gazette*, Dated: 02/04/2015, No: 29314 (Amended: OG-23/03/2017-30016).
- The General Directorate of State Hydraulic Works (DSİ), General Directorate of Water Management (GDWM) and General Directorate of Highways (KGM) will be consulted regarding hydrological studies and surface water quality and any additional studies (if needed) will be conducted prior to the construction phase based on the opinions of these institutions.
- Hazardous materials will not be stored in excavated areas and all handling of all hazardous materials will be in accordance with the Hazardous Material Management Plan which will be developed for the Project. This plan will be in line with IFC EHS Guidelines. As an example, secondary containment structures will consist of berms, dikes, or walls capable of containing the larger 110 percent of the largest tank or 25 percent of the combined tank volumes in areas where hazardous materials are handled (e.g., fuel stores and loading areas, concrete mixing, hazardous material stores) to prevent hazardous materials entering the site drainage.
- An ERP will be developed in line with IFC EHS Guideline for handling spills of hazardous materials including fuels that will be handled during construction works.
- Hazardous Materials Management Plan will be prepared and implemented for the Project.
- Resource Efficiency and Pollution Prevention Plan will be prepared and implemented for the Project.
- Water and Wastewater Management Plan will be developed and implemented for the Project.
- Management of the construction sites during periods of heavy rainfall will be considered. Exposed surfaces and stored materials will be covered if necessary to reduce the erosion of sediments into surface waters.
- In terms of the main campsite(s), a package WWTP with a domestic wastewater collection system will be established at each main campsite. For the subcontractor campsites, generated domestic wastewater will be collected in portable leak-proof quality septic tanks and wastewater then will be disposed of at the main campsite package WWTPs. The treated wastewater then will be discharged where the related PDoEUCC deems appropriate.

[181] DSİ will be asked for an opinion on the subject in order to be sure whether a different study is requested.

- It is possible to construct a package WWTP in Motorway Service Areas. If the treated wastewater is not reused, it will be discharged at a location deemed appropriate by the relevant PDoEUCC.
- Treated domestic wastewater may be reused for local vegetation watering, dust control, or as a fire-fighting reserve, in accordance with the standards outlined in the Wastewater Treatment Plants Technical Procedures Communiqué, if deemed feasible. If the decision is made to implement wastewater reuse, a detailed reuse plan will be developed during the construction phase. This plan will specify which types of wastewater are suitable for each reuse application and include effective control measures to prevent the misuse of reused water.
- For the associated facilities and construction sites along the route, leak-proof quality septic tanks will be provided for the collection of the generated domestic wastewater. Collected wastewater will either be collected by vacuum trucks and disposed of at the nearest licensed WWTP as per the agreements/protocols to be executed with the related municipalities/licensed companies or to the main campsite package WWTPs.
- Water from concrete batching plant operation and washing of concrete mixers will be settled in Water from concrete batching plant operations and the washing of concrete mixers will be settled in sedimentation ponds and recirculated back into the production system to minimize freshwater use. In accordance with Wastewater Treatment/Deep Sea Discharge Plant Project Approval Circular No. 2018/14, a Technical Report will be prepared and approved by the Provincial Directorates of the Ministry of Environment, Urbanization, and Climate Change (MoEUCC) regarding the usability of the settled wastewater generated by concrete batching plants.
- Mud generated from concrete batch plant operations and the washing of cement trucks will be tested for hazardous characteristics. Disposal will be conducted in accordance with Turkish waste management regulations, which align with EU regulations
- Vehicle washing activities and potable water treatment plants may generate industrial wastewater at the campsites. This wastewater will either be directed to a blind shaft, from which it will be collected by vacuum trucks for disposal, or pre-treatment options will be considered before discharge into receiving bodies. To address this, vehicle washing facilities will be securely constructed with a recirculatory system to prevent overflow, and oil-water separators will be installed in the vehicle washing areas.
- The Water Crossing Plan will include monitoring of surface water quality, drainage infrastructure assessment as well as groundwater quality procedures if deemed necessary.
- The following mitigation measures offered on LA113 Road drainage and the water environment by Highways England will be applied for the physical protection of receptors in case of any accidental spill:
    - replacement or alteration of water supply by connection to new sources;
    - installation of low permeability cut-off walls around engineering works or particular receptors to reduce flow impacts;
    - installation of temporary low-permeability cut-off walls that can be removed or degrade over time to prevent long term level or flow alterations;
    - relocation or modification works to protect surface waters against any imposed changes.
    - The design of flood walls and embankments should allow for the discharge of local drainage during a flood, Also, flood mitigation measures may include:
        - amendment of the road geometry;

- flood relief culverts;
- replacement flood storage areas;
- flood walls;
- flood protection embankments, levees or berms;
- local embankments to protect isolated features; and
- changing the resistance of the floodplain to flood flow by:
  - removal of existing obstructions, including vegetation;
  - ground lowering; or
  - creating new openings in existing embankments (to increase conveyance).

- Additionally, risk assessment defined in LA113 will be performed by the Operations & Maintenance Subcontractor/Team. The specific items in the management plans will address the measures below related to surface water and protection:
  - Design and management of spoil and soil storage areas and opening stores of construction materials to control sediment loss into run-off by minimizing the length and angle of slopes.
  - Schemes to prevent new ground surface eruptions from rainfall erosion or to avoid construction activities during periods of heavy rainfall.
  - Contouring and minimising the length and steepness of slopes.
  - Line inspections such as sediment basins from construction sites, as well as local control measures such as sediment fences and control dams.
  - Diversion of external ‘clean’ runoff around the construction area to prevent mixing of ‘clean’ and ‘dirty’ runoff and reduce the size of the required sediment basins.
  - Conveyance of all 'dirty' runoff to the proposed sediment basins.
  - Establishment of barrier fences and/or markings to determine the extent of the structure/work area that may be damaged.
  - Limitation of exposure to the soil and the minimum amount of deterioration required for the construction.
  - Covering and protection of degraded fertile ground with soil, vegetation, mulch or erosion-resistant material.
  - Construction of all drainage structures (e.g., culverts, sediment basins and catch drains).
  - Collection and management of polluted water (if any generated by accidental leakages) in order to prevent mixing with any water body.
  - Protection of existing drainage and irrigation channels, sediment barriers, green areas, protection strips, such as drains, and drainage and erosion control pits by taking appropriate measures.
  - Collection and settlement of drainage from excavations to remove suspended materials prior to discharge in accordance with required permits. Construction of local perimeter drains around working

areas to collect suspended run-off and direct it to a system of settlement basins before discharge following required permits, where practicable.

- Regular inspection and maintenance of all structures and facilities to ensure proper and efficient operation, especially after heavy rainfall. Removing sediment deposits and disposing of them either by spreading them on site (if uncontaminated) or at a suitably licensed facility.
- Minimizing the size and duration of open ground exposure.
- Training workers (including subcontractor workers) on spill response, use of containment and clean-up materials (spill kits).

- A Drainage Management Plan will be developed for the Project to ensure that the motorway's drainage infrastructure is effectively designed.
  - The plan will facilitate the proper channeling of rainwater into existing surface water bodies.
  - It will include measures to prevent flooding, soil erosion, and water pollution.
  - The plan will ensure the proper design, construction, and ongoing maintenance of drainage systems.
  - It may also incorporate strategies for monitoring drainage performance over time.
  - The Drainage Management Plan will help identify potential issues and implement corrective actions as needed.
  - It will contribute to the long-term sustainability of the project, minimizing adverse environmental impacts.
  - The plan will ensure compliance with relevant environmental standards.
- In addition to standard drainage systems, the installation of sediment and oil separators should be assessed to capture and remove pollutants such as oil, grease, and particulates from rainwater runoff before it enters surface water bodies. These separators will help reduce the environmental impact by filtering out harmful substances that can degrade water quality.
- To minimize pollutant buildup on the road surface, regular cleaning and maintenance of the motorway will be undertaken. This will reduce the potential for pollutants such as litter, oil, and tire residues from being washed into drainage systems during rainfall.

#### *7.1.4.3 Residual Impacts*

##### 7.1.4.3.1 Construction Phase

The residual impact following above mentioned mitigation measures during construction phase is presented in the following table (Table 152).

Based on the baseline conditions of the assessed components, the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **negligible to low negative impact** is expected on the hydrology and surface water quality during the construction phase.

**Table 152: Impact Assessment Matrix for Hydrology and Surface Water Quality During Construction Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Changes in flow/circulation in natural water bodies | Duration: | Medium | Medium-low | Long term | **Medium** | Medium high | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Surface water pollution | Duration: | Medium | Medium | Mid term | **Medium** | High | **Negligible** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Discharge of wastewater/water | Duration: | Medium | Medium | Mid term | **Medium** | High | **Negligible** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.4.3.2 Operation Phase

The residual impact after the application of the above-mentioned mitigation measures during commissioning and operation phase is presented in the following table (Table 153).

Based on the baseline conditions of the assessed components, the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **negligible to low negative impact** is expected on the hydrology and surface water quality during the operation phase.

**Table 153: Impact Assessment Matrix for Hydrology and Surface Water Quality During Commissioning and Operation Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Surface water pollution | Duration: | Very long | Medium-low | Mid term | **Low** | High | **Negligible** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Pollution to Surface Water Bodies from Rainwater Runoff | Duration: | Very long | Medium-low | Mid term | **Low** | High | **Negligible** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Changes in surface run-off patterns | Duration: | Very long | Medium-low | Long term | **Medium** | Medium high | **Low** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| | Duration: | Very long | | Mid term | **Medium** | High | **Negligible** |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Discharge of wastewater/water | Frequency: | Continuous | Medium-low | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.4.3.3 Decommissioning and Closure Phase

Decommissioning phase activities are likely to be very similar to the construction phase. Decommissioning of infrastructures could have a ***positive impact*** if the natural state of the land is recovered. Same considerations describe for the construction phase are applicable here as well.

### *7.1.4.4 Monitoring*

The monitoring program to be used for surface water quality will be based on site-specific risk assessments as well as specific guidelines for surface water quality standards given in the regulatory framework (Category I = very good; II = good) as stated in the General EHS Guidelines, especially regarding emissions or effluents from road maintenance facilities. The framework for the monitoring program will be as follows:

- Surface water monitoring in terms of both quality and quantity will continue at the surface water monitoring locations given in previous sections of the report (see Section 6.1.6) during the construction and operation phase. Water quality and sedimentation will be monitored. A sequential monitoring programme will be prepared parallel to the construction and the relevant surface water sampling and monitoring points will be monitored for at least 2 seasons, if available, before each river crossing. Surface water sampling and monitoring activities will continue until the end of operation phase. Baseline monitoring results will be used to detect any kind of surface water pollution. Using monitoring data, trends will be analysed. The data should be reviewed periodically (at least on an annual basis) by EPC Contractor and/or an independent supervisor to establish current site conditions and to detect any trends in surface water quality. If significant trends are observed, then potential causes should be investigated, and corrective measures should be taken, as necessary. During monitoring, the surface water flow rates will be monitored by current-meters and the monitoring and sampling operations at the monitoring locations will be conducted by an independent company or an accredited laboratory by the Ministry of Environment, Urbanization and Climate Change (MoEUCC) in Turkey
- Assessment of surface water runoff and flooding conditions after heavy rainfall events for efficiency of water conveyance systems will be implemented.
- To ensure the measures listed above are in place (like concrete pavement in storage areas, collection pond underneath, gravel spread to unpaved areas etc.), design checks will be undertaken.
- Routine site inspections will be carried out for road construction and dust suppression activities as well as any possible leakages, and these inspections should be recorded.
- Periodic site inspections will be carried out to identify any possible damage in the hazardous materials storage areas and waste storage areas.
- Routine site inspections will be carried out to ensure an adequate amount of spill-response material such as spill-kits and metal trays will be present at the site and in each heavy machinery and records will be kept.
- Trainings on spill response, use of containment and clean-up material for the workers (including the subcontractors' workers) will be recorded.

### 7.1.5 Hydrogeology and Groundwater Quality

Large construction sites, if not properly managed and operated, can lead to significant impacts on groundwater quantity and quality with the main risks of contamination being intentional discharges or accidental leaks and spills of liquid cement, fuel oils and lubricants from construction and overuse of groundwater.

Since groundwater resources are used for drinking and/or domestic purposes, based on the information collected in the baseline (Chapter 6.1.7), hydrogeology and groundwater quality component has been assigned a **medium-low to medium** value of sensitivity.

#### *7.1.5.1 Impact Analysis*

##### 7.1.5.1.1 Construction Phase

Impacts on the hydrogeology and groundwater quality component during the construction phase are related to the following **impact factors**[182]:

- Changes in the local morphology and hydrogeology, and
- Groundwater pollution.

The **Project actions** related to the abovementioned impact factor are the following:

- Surface levelling and grading (including dismantling of existing structures),
- Temporary stockpiling of material,
- Construction of the associated facilities,
- Operation of associated facilities during construction,
- Disposal of waste deriving from construction (including excavated soil), and
- Groundwater exploitation (demand for freshwater and dewatering for construction works).

All the impact factors identified above are assessed below for the construction phase.

**Changes in the Local Morphology and Hydrogeology**

With excavation operations in borrow pits and quarries, and surface levelling and grading, groundwater seepage can occur. This can be prevented by applying dewatering operations that aim to reduce the groundwater level to a predetermined level, which will change the natural groundwater flow regime as a result.

The borrow sites, rock quarries and basalt quarry that are planned to be excavated within the scope of the Project's construction phase will naturally provoke irreversible alterations on the integrity of the geomorphology. These areas may give rise to hydrogeological instability and provoke rock-falls and debris flow that may cause superficial water pollution.

During the construction phase, water will be needed not only for workers as drinking water but also for construction activities such as dust suppression. Water might be supplied from either the city water network or external sources such as the nearest surface water body or spring. No groundwater wells are anticipated to be drilled for the water supply needed for the Project at this stage. If water needed to be supplied from an existing groundwater well or a groundwater well newly constructed for the same purpose, a Groundwater Management

[182] No groundwater wells are anticipated to be drilled for the water supply needed for the Project at this stage. Therefore, the impact factor of "groundwater depletion" has not been assessed separately. The Project is not expected to involve any activities that would lower the groundwater levels.

Plan will be prepared and implemented, and the impact factor of groundwater depletion will be assessed before any decisions are made regarding water supply.

If required, groundwater generated from dewatering will be pumped out and collected in settling ponds to reduce sediment concentrations. The implementation of total suspended solids (TSS) prevention and control strategies should target concentrations of 50 milligrams per liter (mg/L) at the point of discharge according to the IFC's EHS Guideline for Construction Materials Extraction. After that a sample will be taken, and if appropriate, it will be discharged to the nearest environment. The details of the dewatering plan will be described in the Groundwater Management Plan which will be updated according to the Project's requirements.

**Groundwater pollution**

The possibility of contamination of aquifers in the event of intentional or accidental discharges of hazardous materials to the ground during construction, particularly in shallow overburdened areas, may increase.

Aquifers may be affected by various activities involving site clearance/earthworks, and spillages/leakages from the construction plant and at refuelling and storage depots located on site.

Construction accommodation compounds along the route will be developed to house construction workers. All wastewater from these compounds poses a risk to the water environment if not treated prior to discharge (either by on-site treatment or removal for disposal via the local sewage network, if available).

Waste derived from construction can lead to groundwater pollution if it is not properly managed. The temporary storage of waste and/or hazardous substances deriving from the construction operations, if not properly managed, could result in a release of pollutants onto the soil surface/ground. Accidental leakages from hazardous substances or machine refuelling or maintenance are also potential hazards. During construction, pollution may reach groundwater through the soil if the effectiveness of the taken mitigation measures cannot be ensured. No particularly hazardous material is predicted to be used during construction; accidental spills of pollutants from machinery/vehicles would reach groundwater only if the spilt material is in large quantities and the material is spilt over a period of time.

The temporary storage of waste and/or hazardous materials from construction activities could, if not properly managed, result in the release of contaminants to the surface/ground. Accidental spills from the use of hazardous substances, refuelling or maintenance of machinery are also potential hazards. Pollution may migrate through the soil to the groundwater if the effectiveness of mitigation measures cannot be ensured. No particularly hazardous materials are expected to be used during construction; accidental spills of pollutants from machinery/vehicles will only reach groundwater if the spill is large and occurs over a period.

Additionally, wastewaters which will be generated at the construction sites and camps due to water consumption of the personnel may not only pollute surface waters but also groundwater by infiltration without any mitigation measures. For domestic wastewater generated by operation of the associated facilities, it is foreseen that, if possible, wastewater can be connected to the local/municipal sewage network which should be ended with proper wastewater treatment facility sustains the discharge quality standards. Otherwise, package wastewater treatment plant (WWTP) with domestic wastewater collection system will be established or generated domestic wastewaters will be collected in portable leak-proof quality septic tanks and wastewaters then will be transport by a licenced contractor to a nearest licensed wastewater treatment facility which sustains the discharge requirements. With the commissioning of WWTPs, treated wastewaters, which will be treated in accordance with the Project Standards defined in the Appendix A, will be discharged to the receiving environment in line with the environmental permits to be obtained from the PDoEUCC under the Regulation on Environmental Permits and Licences.

#### 7.1.5.1.2 Operation Phase

Impacts on this component during the commissioning and operation phase will be same as the construction phase and are related to the following ***impact factors:***

- Changes in the local hydrogeology, and
- Groundwater pollution.

Impacts could be due to the following ***Project actions***:

- Groundwater exploitation (demand for freshwater), and
- Operation of the motorway and service facilities.

All the impact factors identified above are assessed below for the operation phase.

**Changes in the local hydrogeology**

In case of a freshwater demand, groundwater can be abstracted to meet the water demands.

**Groundwater pollution**

The details related to this impact factor are also detailed in the previous section (construction phase).

#### 7.1.5.1.3 Decommissioning and Closure Phase

The impacts during the decommissioning phase are likely to be similar to the construction phase hence the activities will be similar to construction activities. The same considerations described for this component during the construction phase would be applicable to the decommissioning phase for the groundwater pollution impact factor.

A new impact is not expected during the decommissioning and closure phase of the Project, other than those listed in the construction and operation phases.

### *7.1.5.2 Mitigation Measures*

The mitigation measures related to hydrogeology and groundwater quality for the construction, the commissioning/operation and decommissioning/closure phase are as follows:

- Measures incorporated in the Project Design:
  - The General Directorate of State Hydraulic Works (SHW), General Directorate of Water Management (GDWM) and General Directorate of Highways (KGM) will be consulted regarding hydrogeological studies and groundwater quality and any additional studies (id needed) will be conducted upon their opinions prior to the construction phase. Hydrogeology will be assessed at sites where aquifers may be directly affected or exposed, including borrow pits and quarries.
  - In the case of drilling well(s) for water supply, drilling and well development operations will be carried out in accordance with American Society for Testing and Materials (ASTM) standards. Pollutants (such as oil and fuel) originating from machinery and equipment will be prevented from mixing with groundwater. During the preparation of the area where the drilling machine can work before drilling, the possible pollutions from the excavation will be eliminated.
  - Pumping tests will be performed after drilling operations, within the scope of the necessary permits obtained from SHW. The most suitable aquifer test for wells will be determined according to ASTM D4043-17: Standard Guide for Selection of Aquifer Test Methods in Determining Hydraulic Properties by Well Techniques. Hydraulic parameters such as transmissivity and storage coefficient will be

calculated according to ASTM standards. The effects of continuous discharge from wells on the groundwater flow system will be evaluated using the same data.

- The use of groundwater resources will be subject to SHW approval. SHW will allow the drilling and use of wells for water supply in case the groundwater resource is adequate. Such approvals are based on the availability of water supply.
- A Groundwater Management Plan will be prepared and implemented, and the impact factor of groundwater depletion will be assessed before any decisions are made regarding water supply. Before developing the Groundwater Management Plan, additional data on groundwater quality will be requested from the Turkish State Hydraulic Works. This data will be assessed and used to supplement the information gathered during the monitoring and sampling campaign, which will be outlined in the Groundwater Management Plan.
- In case groundwater is encountered during the construction, groundwater should be abstracted from the work area by dewatering studies. Treatment, storage and disposal should be done according to regulatory requirements after performing the necessary analyses and obtaining relevant permits.
- If deemed necessary a Water Sustainability Study, containing a Water Balance and hydro census study, for the AoI to assess identified water requirements and potential resources could be conducted for the Project.

General mitigation measures:

- No fuelling of vehicles or equipment will take place within excavated areas. If heavy equipment cannot be moved to appropriate fuelling points, an impervious surface (such as a drip-tray) will be used for refuelling this equipment to prevent accidental releases to groundwater aquifers.
- Hazardous materials will not be stored in excavated areas and all handling of all hazardous materials will be in accordance with the Hazardous Material Management Plan which will be developed for the Project. This plan will be in line with IFC EHS Guidelines. As an example, secondary containment structures will consist of berms, dikes, or walls capable of containing the larger 110 percent of the largest tank or 25 percent of the combined tank volumes in areas where hazardous materials are handled (e.g., fuel stores and loading areas, concrete mixing, hazardous material stores) to prevent hazardous materials entering the site drainage.
- An ERP will be developed in line with IFC EHS Guideline for handling spills of hazardous materials including fuels that will be handled during construction works.
- Hazardous Materials Management Plan will be prepared and implemented for the Project.
- Resource Efficiency and Pollution Prevention Plan will be prepared and implemented for the Project.
- Water and Wastewater Management Plan will be developed and implemented for the Project.
- The Water Crossing Plan will include monitoring of surface water quality, drainage infrastructure assessment as well as groundwater quality procedures if deemed necessary The monitoring of the groundwater resources will be based on guideline to be developed following the hydrogeological investigations. The guideline will be based on the Guidance on Groundwater Monitoring, Common Implementation Strategy for the Water Framework Directive (2000/60/EC).
- The specific items in the management plans will address the measures below related to groundwater and protection:

- Preventing the discharge of untreated wastewater, residues or other waste into groundwater or surface water.
- Controlling and avoiding wastewater flows from any field activities (i.e., excavations, drilling, re-fuelling and vehicle/equipment washing).
- Collecting and managing contaminated water (if any generated as a result of accidental leakages) in order to prevent mixing with any water body and topsoil/soil pollution.
- Assuring the maintenance of vehicles and equipment (if necessary) in designated areas with impermeable surfaces (concrete floors, etc.) and if necessary, secondary containment systems.
- Making portable spill containment and clean-up materials (spill kits) available and easily accessible at the construction site, including instructions on how to use spill containment and clean-up materials.
- Training workers (including subcontractor workers) on spill response, use of containment and clean-up materials (spill kits).
- Providing adequate and properly maintained tanks, paved ground, spill containment materials and proper secondary containment systems with sufficient volume for fuel/oil storage and for the storage of other fluids and hazardous substances to prevent loss to the soil.

### *7.1.5.3 Residual Impacts*

#### 7.1.5.3.1 Construction Phase

The residual impact on the hydrogeology and groundwater quality component after the application of the abovementioned mitigation measures during construction phase is presented in the following table (Table 154).

Based on the baseline conditions of the assessed components, the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **negligible to low negative impact** is expected on the hydrogeology and groundwater quality during the construction phase.

**Table 154: Impact Evaluation Matrix for Hydrogeology and Groundwater Quality Component During Construction Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Groundwater pollution | Duration: | Medium | Medium-low | Long term | **Medium** | High | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Changes in the local hydrogeology | Duration: | Medium | Medium | Long term | **High** | Medium high | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.5.3.2 Operation Phase

The residual impact on the hydrogeology and groundwater quality component after the application of the abovementioned mitigation measures during operation phase is presented in the following table (Table 155).

Based on the baseline conditions of the assessed components, the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **negligible to low negative impact** is expected on the hydrogeology and groundwater quality during the operation phase.

**Table 155: Impact Evaluation Matrix for Hydrogeology and Groundwater Quality Component During Operation Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Groundwater pollution | Duration: | Very long | Medium-low | Long term | **Medium** | High | **Negligible** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Changes in the local hydrogeology | Duration: | Very long | Medium-low | Long term | **Medium** | Medium high | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.5.3.3 Decommissioning and Closure Phase

Decommissioning phase activities are likely to be very similar to the construction phase. The same considerations described for hydrogeology and groundwater quality during the construction phase would be applicable to the decommissioning phase for the groundwater pollution impact factor.

Decommissioning of infrastructures could have a ***positive impact*** if the natural state of the land is recovered.

### *7.1.5.4 Monitoring*

Since the monitoring measures written in this section are the same measures for both construction and operation periods, they are listed together here. Both construction and operation period monitoring measures are as follows:

- The monitoring of groundwater resources will be based on guidelines developed following hydrogeological investigations. The guideline will be based on the Guidance on Groundwater Monitoring, Common Implementation Strategy for the Water Framework Directive (2000/60/EC) and will include the following items:
  - Identification of existing extraction wells (irrigation, domestic and public use) within the zone of influence,
  - Periodic monitoring of groundwater quantity and quality during the construction period,
  - Periodic monitoring of groundwater discharge locations (stream or lake monitoring) and the operation period,
  - Periodic monitoring of groundwater levels to assess seasonal variability.
- Groundwater monitoring in terms of both quality and quantity will continue at the groundwater monitoring locations given in previous sections of the report (Section 6.1.7) during the construction and operation phases. A sequential monitoring programme will be prepared parallel to the construction and the relevant groundwater sampling and monitoring points will be monitored for at least 2 seasons, if available,, and will continue until the end of operation phase. It is suggested that the monitoring program will be expanded using water wells identified by hydro census studies within the scope of the Meriç-Ergene Basin Hydrogeological Survey (ongoing) and Marmara Basin Hydrogeological Survey (2022) conducted by SHW. In the case of the monitoring program's extension, the aquifers and groundwater bodies defined within the same studies will be considered. Groundwater monitoring will be seasonal. Using monitoring data, trends

will be analysed. The data should be reviewed periodically (at least on an annual basis) by EPC Contractor and/or an independent supervisor to establish current site conditions and to detect any trends in groundwater quality or levels. If significant trends are observed, then potential causes should be investigated, and corrective measures should be taken, as necessary.

- During monitoring, the groundwater levels will be monitored continuously by either manual dip meters or internal transmitters and the monitoring and sampling operations at the monitoring wells based on the EIA commitments will be conducted by an independent company or an accredited laboratory by the MoEUCC in Türkiye.
- Design checks, to ensure the measures listed above are in place (like concrete pavement in storage areas, collection pond underneath etc.) and, will be undertaken.
- The provided training on spill response, use of containment and clean-up material for the workers (including the subcontractors' workers) will be recorded.
- Routine site inspections will be carried out to ensure an adequate amount of spill-response material such as spill-kits and metal trays will be present at the site and in each heavy machinery and records will be kept.
- A routine maintenance programme will be set up and maintenance records will be kept for all vehicles and machinery/equipment.
- By using appropriate sealing mechanisms (enclosed conveyance of the extracted groundwater to settlement structures), potential chemicals will not come into contact with the dewatered groundwater. Discharges will be periodically tested to meet Turkish and international standards (e.g. IFC General EHS Guidelines, EU standards).

### 7.1.6 Air Quality

#### *7.1.6.1 Air Quality Baseline Summary*

In order to identify and assess the air quality baseline conditions within the AoI, 66 representative measurement locations, which are mostly the closest sensitive receptor to the planned motorway route and other facilities, have been determined for $PM_{10}$, $PM_{2.5}$, $SO_2$, $NO_2$ and settled dust measurements. Details of the air quality measurements conducted are presented below and also in Section 6.1.8:

- Daily $PM_{10}$ and $PM_{2.5}$ measurements were conducted for 24 hours continuously at each representative location in September 2022, in line with TS EN 12341 standard.
- 2-months settled dust measurements were conducted at each representative location between September 19$^{th}$, 2022, and November 19$^{th}$, 2022, in line with TS 2342 standard.
- Monthly $NO_2$ and $SO_2$ measurements were conducted for 2 months period between September 19$^{th}$, 2022, and November 20$^{th}$, 2022, by using passive sampling tubes at each representative location in line with TS EN 13528 – 1, 2, 3 standards.

The analysis results are compared with the Turkish and European limit values as well as IFC standards. Accordingly;

- All $PM_{10}$ measurement results are below the regulatory limit value, which is 50 µg/m³. Highest PM10 concentration is measured as 25.8 µg/m³ at AQ-3 air quality measurement location, which is a residential receptor and close to the storage area (with a distance of 2,150 m).

- All $PM_{2.5}$ measurement results are below the regulatory limit value, which is 25 µg/m³ and IFC standard (20 µg/m³). Highest PM2.5 concentration is measured as 13.3 µg/m³ at AQ-36 air quality measurement location, which is a residential receptor having a distance of 1,000 m to the motorway route.
- All Settling Dust measurement results are below the regulatory limit values, which are 210 mg/m²day for long term value and 390 mg/m²day for short term value. Highest settling dust concentration is measured as 104.2 mg/m²day and 111.89 mg/m²day for long term and short term, respectively, at AQ-2 air quality measurement station, which is a commercial receptor and having a distance of 680 m to the motorway route.
- All average $SO_2$ and $NO_2$ measurement results are below the regulatory limit values, which is 20 µg/m³ and 40 µg/m³, respectively. Highest $SO_2$ concentration is measured as 12.94 µg/m³ and highest $NO_2$ concentration is measured as 12.62 µg/m³ at AQ-54 and AQ-17 air quality measurement locations, respectively.

During the modelling studies for Settled Dust, $PM_{10}$ and $PM_{2.5}$, these 66 baseline measurement locations were included in the model runs as discrete receptors (sensitive receptor) and the modelling results assessed cumulatively with the measurement results in these locations.

### *7.1.6.2 Air Pollutant Sources*

#### 7.1.6.2.1 Construction Phase

Construction activities may generate emission of fugitive dust caused by a combination of topsoil stripping, surface levelling and grading, cut excavation / backfilling activities on the motorway route, excavation activities to be carried out for the engineering structures, and the operation of temporary and associated facilities (borrow sites, rock quarries, basalt quarry, concrete plant, precast plants, camp sites, stores etc.).

During the construction activities, the emission scenarios will be mainly focused on the dust suspension generated by excavation and filling, the stockpiling of the material, activities from quarries and blasting.

Emissions factors (Table 156) defined in the Regulation on Industrial Air Quality Pollution Control (here in after referred as “Air Pollution Regulation”), Annex 12, are used to calculate dust emissions from excavation and fill operations. Uncontrolled emission factors represent the situations where activities are carried out without taking any mitigation measures. On the other hand, the controlled factors stand for the cases where activities are carried out with measures in place such sprinkling, using closed haulage systems, keeping materials moist, loading and unloading without scattering, etc.

**Table 156: Emission Factors used in Dust Emission Estimation**

| Source of emission | Emission factors kg/ton | |
|---|---|---|
| | Uncontrolled Conditions | Controlled Conditions |
| Excavation (kg/ton) | 0.025 | 0.0125 |
| Loading (kg/ton) | 0.010 | 0.005 |
| Unloading (kg/ton) | 0.010 | 0.005 |
| Storage (kg/ha. day) | 5.8 | 2.9 |
| Transportation (total distance) (kg/km-vehicle) | 0.7 | 0.35 |

Gaseous emissions could also be originated during construction activities from fuel combustion in operation of the heavy-duty vehicles. Exhaust emissions of heavy-duty construction equipment are calculated by using the emission standards explained in the Emission Standards Reference Guide published by USEPA. According to

this guide, the major gaseous pollutants emitted from these types of vehicles are nitrogen oxides ($NO_x$), carbon monoxide (CO) and non-methane hydrocarbons (NMHC) (see Table 157).

**Table 157: USEPA Emission Standards for Nonroad Compression-Ignition Engines [1]**

| Rated Power (kW) | NMHC (g/kW-hour) | NOx (g/kW-hour) | PM (g/kW-hour) | CO (g/kW-hour) |
|---|---|---|---|---|
| kW < 8 | - | - | 0.4 | 8.0 |
| 8 ≤ kW < 19 | - | - | 0.4 | 6.6 |
| 19 ≤ kW < 37 | - | - | 0.03 | 5.5 |
| 37 ≤ kW < 56 | - | - | 0.03 | 5.0 |
| 56 ≤ kW < 75 | 0.19 | 0.4 | 0.02 | 5.0 |
| 75 ≤ kW < 130 | 0.19 | 0.4 | 0.02 | 5.0 |
| 130 ≤ kW < 225 | 0.19 | 0.4 | 0.02 | 3.5 |
| 225 ≤ kW < 450 | 0.19 | 0.4 | 0.02 | 3.5 |
| 450 ≤ kW < 560 | 0.19 | 0.4 | 0.02 | 3.5 |
| 560 ≤ kW < 900 | 0.19 | 3.5 | 0.04 | 3.5 |
| kW > 900 | 0.19 | 3.5 | 0.04 | 3.5 |

#### *7.1.6.2.1.1 Dust Emissions*

For the control of dust emission during construction activities, the working area will be water-sprayed in certain periods; especially in dry and windy conditions water spraying activities will be more frequent. Moreover, mitigation measures defined in the relevant section below (Section 7.1.6.8) such sprinkling, using closed haulage systems, keeping materials moist, loading and unloading without skidding and so on will be in place. Since control measures will be taken during construction activities, the emission rate of dust originated from construction activities has been calculated by using the emission factors given for the controlled situation.

##### *Dust Emissions from Cut Excavation and Backfilling Activities along the Motorway Route*

Excavation and backfilling amounts are presented in below table:

**Table 158: Excavation and Backfilling Materials Amount**

| Motorway | Excavation ($m^3$) | Backfilling ($m^3$) |
|---|---|---|
| Kınalı Malkara | 38,945,601.721 | 29,576,454.091 |

According to the construction schedule provided by the Client, construction activities of the Kınalı Malkara Motorway will take 60 months. Accordingly, dust emissions calculated in accordance with the excavation / backfilling amounts presented in Table 159.

[1] https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100OA05.pdf

**Table 159: Total Excavation and Backfilling Amounts**

| Kınalı Malkara Motorway | Amount (m³) | Amount (Annual - m³) | Monthly (m³) | Daily (m³) | Hourly (m³) | Hourly (ton)* |
|---|---|---|---|---|---|---|
| Total Excavation | 38,945,601.72 | 7,789,120.34 | 649,093.36 | 24,965.13 | 2,080.43 | 3,328.68 |
| Total Backfill | 29,576,454.09 | 5,915,290.82 | 492,940.90 | 18,959.27 | 1,579.94 | 2,527.90 |

*Soil density is taken as 1.6 ton/m³.

## *Dust Emissions from Storage Activities*

Excavation material generated during the construction activities of the Kınalı Malkara Motorway will be stored in 15 storage areas. The information regarding storage areas is given in Table 160.

**Table 160: Information regarding Storage Areas**

| Storage Area | Area (m²) | Reserved Amount (m³) | Annual (m³) | Monthly (m³) | Daily (m³) | Hourly (m³) | Hourly (ton)* |
|---|---|---|---|---|---|---|---|
| Storage Area-1 | 228,106 | 900,000 | 180,000 | 15,000.00 | 576.92 | 48.08 | 76.92 |
| Storage Area-2 | 205,436 | 1,200,000 | 240,000 | 20,000.00 | 769.23 | 64.10 | 102.56 |
| Storage Area-3 | 150,942 | 530,000 | 106,000 | 8,833.33 | 339.74 | 28.31 | 45.30 |
| Storage Area-4 | 212,967 | 530,000 | 106,000 | 8,833.33 | 339.74 | 28.31 | 45.30 |
| Storage Area-5 | 335,383 | 1,000,000 | 200,000 | 16,666.67 | 641.03 | 53.42 | 85.47 |
| Storage Area-6 | 281,020 | 500,000 | 100,000 | 8,333.33 | 320.51 | 26.71 | 42.74 |
| Storage Area-7 | 315,073 | 775,000 | 155,000 | 12,916.67 | 496.79 | 41.40 | 66.24 |
| Storage Area-8 | 381,400 | 1,500,000 | 300,000 | 25,000.00 | 961.54 | 80.13 | 128.21 |
| Storage Area-9 | 299,105 | 1,500,000 | 300,000 | 25,000.00 | 961.54 | 80.13 | 128.21 |
| Storage Area-10 | 225,529 | 1,200,000 | 240,000 | 20,000.00 | 769.23 | 64.10 | 102.56 |
| Storage Area-11 | 200,000 | 1,000,000 | 200,000 | 16,666.67 | 641.03 | 53.42 | 85.47 |
| Storage Area-12 | 127,610 | 700,000 | 140,000 | 11,666.67 | 448.72 | 37.39 | 59.83 |
| Storage Area-13 | 202,199 | 1,000,000 | 200,000 | 16,666.67 | 641.03 | 53.42 | 85.47 |
| Storage Area-14 | 126,880 | 600,000 | 120,000 | 10,000.00 | 384.62 | 32.05 | 51.28 |
| Storage Area-15 | 250,478 | 1,000,000 | 200,000 | 16,666.67 | 641.03 | 53.42 | 85.47 |

*Soil density is taken as 1.6 ton/m³.

Dust emissions expected to occur in storage areas are given in Table 161.

**Table 161: Dust Emission Results from Storage Areas**

| Storage Area | Unloading | Storage | Total (kg/h) |
|---|---|---|---|
| Storage Area-1 | 76.92 ton/h x 0.005 kg/ton = 0.39 kg/h | 2.9 kg/ha-day x 22.8106 ha x 1 day/24 hours = 2.76 kg/h | 3.15 |
| Storage Area-2 | 102.56 ton/h x 0.005 kg/ton = 0.52 kg/h | 2.9 kg/ha-day x 20.5436 ha x 1 day/24 hours = 2.49 kg/h | 3.01 |
| Storage Area-3 | 45.3 ton/h x 0.005 kg/ton = 0.23 kg/h | 2.9 kg/ha-day x 15.0942 ha x 1 day/24 hours = 1.83 kg/h | 2.06 |
| Storage Area-4 | 45.3 ton/h x 0.005 kg/ton = 0.23 kg/h | 2.9 kg/ha-day x 21.2967 ha x 1 day/24 hours = 2.58 kg/h | 2.81 |
| Storage Area-5 | 85.47 ton/h x 0.005 kg/ton = 0.43 kg/h | 2.9 kg/ha-day x 33.5383 ha x 1 day/24 hours = 4.06 kg/h | 4.49 |
| Storage Area-6 | 42.74 ton/h x 0.005 kg/ton = 0.22 kg/h | 2.9 kg/ha-day x 28.102 ha x 1 day/24 hours = 3.4 kg/h | 3.62 |
| Storage Area-7 | 66.24 ton/h x 0.005 kg/ton = 0.34 kg/h | 2.9 kg/ha-day x 31.5073 ha x 1 day/24 hours = 3.81 kg/h | 4.15 |
| Storage Area-8 | 128.21 ton/h x 0.005 kg/ton = 0.65 kg/h | 2.9 kg/ha-day x 38.14 ha x 1 day/24 hours = 4.61 kg/h | 5.26 |
| Storage Area-9 | 128.21 ton/h x 0.005 kg/ton = 0.65 kg/h | 2.9 kg/ha-day x 29.9105 ha x 1 day/24 hours = 3.62 kg/h | 4.27 |
| Storage Area-10 | 102.56 ton/h x 0.005 kg/ton = 0.52 kg/h | 2.9 kg/ha-day x 22.5529 ha x 1 day/24 hours = 2.73 kg/h | 3.25 |
| Storage Area-11 | 85.47 ton/h x 0.005 kg/ton = 0.43 kg/h | 2.9 kg/ha-day x 20 ha x 1 day/24 hours = 2.42 kg/h | 2.85 |
| Storage Area-12 | 59.83 ton/h x 0.005 kg/ton = 0.3 kg/h | 2.9 kg/ha-day x 12.761 ha x 1 day/24 hours = 1.55 kg/h | 1.85 |
| Storage Area-13 | 85.47 ton/h x 0.005 kg/ton = 0.43 kg/h | 2.9 kg/ha-day x 20.2199 ha x 1 day/24 hours = 2.45 kg/h | 2.88 |
| Storage Area-14 | 51.28 ton/h x 0.005 kg/ton = 0.26 kg/h | 2.9 kg/ha-day x 12.688 ha x 1 day/24 hours = 1.54 kg/h | 1.80 |
| Storage Area-15 | 85.47 ton/h x 0.005 kg/ton = 0.43 kg/h | 2.9 kg/ha-day x 25.0478 ha x 1 day/24 hours = 3.03 kg/h | 3.46 |
| Total Dust Emission from Storage Area | | | **48.91 kg/h** |

### *Dust Emissions from Borrow Sites and Quarries*

The production capacities of the quarries planned to be operated for the project are given in below table.

**Table 162: Production Capacities for Borrow Sites and Quarries**

| Name | Annual Capacity (Ton) | Monthly Capacity (Ton)* | Daily Capacity (Ton) | Hourly Capacity (Ton) |
|---|---|---|---|---|
| **Borrow Pits** | | | | |
| Çanta - 1 | 600,000 | 60,000 | 2,307.69 | 192.31 |
| Çanta - 2 | 600,000 | 60,000 | 2,307.69 | 192.31 |
| Türkgücü - 1 | 500,000 | 50,000 | 1,923.08 | 160.26 |
| Türkgücü - 2 | 500,000 | 50,000 | 1,923.08 | 160.26 |
| Türkgücü - 3 | 500,000 | 50,000 | 1,923.08 | 160.26 |
| İnecik Kuzey - 1 | 600,000 | 60,000 | 2,307.69 | 192.31 |
| İnecik Kuzey - 2 | 600,000 | 60,000 | 2,307.69 | 192.31 |
| İnecik Güney - 1 | 600,000 | 60,000 | 2,307.69 | 192.31 |
| İnecik Güney - 2 | 600,000 | 60,000 | 2,307.69 | 192.31 |
| Akçahalil - 1 | 500,000 | 50,000 | 1,923.08 | 160.26 |
| Akçahalil - 2 | 500,000 | 50,000 | 1,923.08 | 160.26 |
| Akçahalil - 3 | 500,000 | 50,000 | 1,923.08 | 160.26 |
| **Quarries** | | | | |
| Danamandıra- 1 | 800,000 | 80,000 | 3,076.92 | 256.41 |
| Danamandıra- 2 | 1,000,000 | 100,000 | 3,846.15 | 320.51 |
| Muratlı | 300,000 | 30,000 | 1,153.85 | 96.15 |
| Osmanlı | 800,000 | 80,000 | 3,076.92 | 256.41 |
| Dereköy | 800,000 | 80,000 | 3,076.92 | 256.41 |
| Tepeköy | 800,000 | 80,000 | 3,076.92 | 256.41 |

*Working hours are taken as 260 day/year and 12 hours/day

**Table 163: Dust Emissions from Borrow Sites and Quarries**

| Name | Dismantling | Loading | Total |
|---|---|---|---|
| **Borrow Pits** | | | |
| Çanta - 1 | 192.31 ton/h x 0.0125 kg/ton = 2.41 kg/h | 192.31 ton/h x 0.005 kg/ton = 0.97 kg/h | 3.38 kg/h |
| Çanta - 2 | 192.31 ton/h x 0.0125 kg/ton = 2.41 kg/h | 192.31 ton/h x 0.005 kg/ton = 0.97 kg/h | 3.38 kg/h |

| Name | Dismantling | Loading | Total |
|---|---|---|---|
| Türkgücü - 1 | 160.26 ton/h x 0.0125 kg/ton = 2.01 kg/h | 160.26 ton/h x 0.005 kg/ton = 0.81 kg/h | 2.82 kg/h |
| Türkgücü - 2 | 160.26 ton/h x 0.0125 kg/ton = 2.01 kg/h | 160.26 ton/h x 0.005 kg/ton = 0.81 kg/h | 2.82 kg/h |
| Türkgücü - 3 | 160.26 ton/h x 0.0125 kg/ton = 2.01 kg/h | 160.26 ton/h x 0.005 kg/ton = 0.81 kg/h | 2.82 kg/h |
| İnecik Kuzey - 1 | 192.31 ton/h x 0.0125 kg/ton = 2.41 kg/h | 192.31 ton/h x 0.005 kg/ton = 0.97 kg/h | 3.38 kg/h |
| İnecik Kuzey - 2 | 192.31 ton/h x 0.0125 kg/ton = 2.41 kg/h | 192.31 ton/h x 0.005 kg/ton = 0.97 kg/h | 3.38 kg/h |
| İnecik Güney - 1 | 192.31 ton/h x 0.0125 kg/ton = 2.41 kg/h | 192.31 ton/h x 0.005 kg/ton = 0.97 kg/h | 3.38 kg/h |
| İnecik Güney - 2 | 192.31 ton/h x 0.0125 kg/ton = 2.41 kg/h | 192.31 ton/h x 0.005 kg/ton = 0.97 kg/h | 3.38 kg/h |
| Akçahalil - 1 | 160.26 ton/h x 0.0125 kg/ton = 2.01 kg/h | 160.26 ton/h x 0.005 kg/ton = 0.81 kg/h | 2.82 kg/h |
| Akçahalil - 2 | 160.26 ton/h x 0.0125 kg/ton = 2.01 kg/h | 160.26 ton/h x 0.005 kg/ton = 0.81 kg/h | 2.82 kg/h |
| Akçahalil - 3 | 160.26 ton/h x 0.0125 kg/ton = 2.01 kg/h | 160.26 ton/h x 0.005 kg/ton = 0.81 kg/h | 2.82 kg/h |
| **Quarries** | | | |
| Danamandıra- 1 | 256.41 ton/h x 0.0125 kg/ton = 3.21 kg/h | 256.41 ton/h x 0.005 kg/ton = 1.29 kg/h | 4.50 kg/h |
| Danamandıra- 2 | 320.51 ton/h x 0.0125 kg/ton = 4.01 kg/h | 320.51 ton/h x 0.005 kg/ton = 1.61 kg/h | 5.62 kg/h |
| Muratlı | 96.15 ton/h x 0.0125 kg/ton = 1.21 kg/h | 96.15 ton/h x 0.005 kg/ton = 0.49 kg/h | 1.70 kg/h |
| Osmanlı | 256.41 ton/h x 0.0125 kg/ton = 3.21 kg/h | 256.41 ton/h x 0.005 kg/ton = 1.29 kg/h | 4.50 kg/h |
| Dereköy | 256.41 ton/h x 0.0125 kg/ton = 3.21 kg/h | 256.41 ton/h x 0.005 kg/ton = 1.29 kg/h | 4.50 kg/h |
| Tepeköy | 256.41 ton/h x 0.0125 kg/ton = 3.21 kg/h | 256.41 ton/h x 0.005 kg/ton = 1.29 kg/h | 4.50 kg/h |
| **Total Dust Emission from Borrow pits and Quarries** | | | **62.52 kg/h** |

### *Dust Emissions from Mechanical Plants*

The mechanical plant is used for the preparation of aggregate required for the production of asphalt and concrete. The aggregate discharged to the mechanical plant is processed and separated according to size.

It is planned to operate 2 mechanical plant facilities with a capacity of 500 tonnes/hour within the scope of the project for the motorway route.

**Table 164: Dust Emissions from Mechanical Plants**

| Name | Dismantling | Loading | Total |
|---|---|---|---|
| Mechanical Plant-1 | 500 ton/h x 0,005 kg/ton =2.5 kg/h | 500 ton/h x 0,005 kg/ton =2.5 kg/h | 5 kg/h |
| Mechanical Plant-2 | 500 ton/h x 0,005 kg/ton =2.5 kg/h | 500 ton/h x 0,005 kg/ton =2.5 kg/h | 5 kg/h |
| **Total Dust Emission from Mechanical Plants** | | | **10 kg/h** |

### *Dust Emissions from Concrete Batching Plants*

It is planned to operate 3 concrete batching plants with a capacity of 90 m³/hour for the motorway route. 75% of the raw material used in concrete plants consists of aggregate (168.75 tons/hr).

Since cement is unloaded from the silo into the concrete batching plant mixer bunker with a closed pipe, there will be no dust emission from the unloading of cement. In Table 165, dust emission calculations originating from each concrete plant are given.

**Table 165: Dust Emission Originated from Each Concrete Plant**

| Name | Capacity | Material Loading to Bunker | Total |
|---|---|---|---|
| Concrete Batching Plant-1 | 90 m³/hour | 168.75 ton/h x 0.005 kg/ton=0.85 kg/h | 0.85 kg/h |
| Concrete Batching Plant-2 | 90 m³/hour | 168.75 ton/h x 0.005 kg/ton=0.85 kg/h | 0.85 kg/h |
| Concrete Batching Plant-3 | 90 m³/hour | 168.75 ton/h x 0.005 kg/ton=0.85 kg/h | 0.85 kg/h |
| **Total Dust Emission from Concrete Batch Plants** | | | **2.55 kg/h** |

### *Dust Emissions from Asphalt Plants*

It is planned to operate 2 asphalt plants with a capacity of 240 tons/hr for the motorway route. In Table 166, dust emission calculations originating from each asphalt plant are given.

**Table 166: Dust Emission Originated from Each asphalt Plant**

| Name | Capacity | Material Loading to Bunker | Total |
|---|---|---|---|
| Asphalt Plant-1 | 240 ton/h | 240 ton/h x 0.005 kg/ton=1.2 kg/h | 1.2 kg/h |
| Asphalt Plant-2 | 240 ton/h | 240 ton/h x 0.005 kg/ton=1.2 kg/h | 1.2 kg/h |
| **Total Dust Emission from Asphalt Plants** | | | **2.4 kg/h** |

### *Dust Emissions from Blasting Activities*

It is planned to conduct minimum of 1 blasting in every 2 days in the quarries. Dust emission calculations due to blasting activities are given in Table 167.

**Table 167: Dust Emissions from Blasting Activities**

| Blasting | Calculation |
|---|---|
| Quarries | Surface area = loading distance x distance between holes x Number of holes = 2.2 m x 2.8 m x 100 holes = 616 m².<br><br>Emission factor (PM ≤ 30µm) = 0.00022 x $A^{1.5}$<br><br>A: surface area ($m^2$), depth ≤ 21 m<br><br>Emission factor unit: with the kg/blasting formula EF (PM<30µm) = 3.36 kg/blasting. |

### *Total Dust Emission*

The calculated dust emissions refer to total suspended particles (TSP). Therefore, in order to calculate $PM_{10}$ and $PM_{2.5}$ ratio from calculated TSP, US EPA emission factors illustrated below are used (see Table 168).

**Table 168: $PM_{10}$ and $PM_{2.5}$ ratios**

| Particle Size, µm | Cumulative % ≤ Stated Size |
|---|---|
| 2.5 | 15 |
| 10.0 | 51 |

$PM_{10}$ and $PM_{2.5}$ emissions calculated according to the above-mentioned factors are presented in Table 169.

**Table 169: Total Dust Emissions**

| Activity | TSP Emissions (kg/hour) | $PM_{10}$ TSP x 51% (kg/hour) | $PM_{2.5}$ TSP x 15% (kg/hour) |
|---|---|---|---|
| Excavation | 58.25 | 29.71 | 8.74 |
| Backfilling | 25.28 | 12.89 | 3.79 |
| Storage | 48.91 | 24.94 | 7.34 |
| Quarries | 62.52 | 31.89 | 9.38 |
| Mechanical Plants | 10.00 (5 x 2) | 5.10 | 1.50 |
| Concrete Batching Plants | 2.55 (0.85 x 3) | 1.30 | 0.38 |
| Asphalt Plants | 2.40 (1.20 x 2) | 1.22 | 0.36 |
| Blasting | 20.16 (3.36 x 6) | 10.28 | 3.02 |
| Total | 230.07 | 117.33 | 34.51 |

#### 7.1.6.2.1.2 Gaseous Emissions

During construction phase, gaseous emissions may emerge from the following activities:

- Gaseous emissions from the construction vehicles/equipment
- Gaseous emissions from the emergency generators

##### Gaseous emissions from the construction vehicles/equipment

Gaseous emissions are originated from the exhaust emissions due to fuel combustion in operation of the heavy-duty vehicles during construction phase. Gaseous pollutant emissions for heavy machinery are calculated by using emission factors defined in the Emission Standards Reference Guide of USEPA (see Table 157 for emission factors).

As per information provided by the Client, the construction works will be carried out simultaneously in different sections of the Project. During calculation of the exhaust emissions caused by the construction machinery, the number of machines and equipment to be worked simultaneously in each planned section of construction are evaluated. By this way, for the evaluation of the gaseous emissions, the maximum number of machines and equipment to be worked at the same time is selected to represent emissions to be occurred as worst-case scenario.

The amount of gaseous pollutants calculated by using emission factors are presented in Table 170 and Table 171.

**Table 170: Pollutant Emissions Originated from the Each Construction Equipment**

| Construction Equipment | Number of Equipment | Rated Power* (kW) | Parameter | Emission (kg/hour) |
|---|---|---|---|---|
| Fuel Tanker | 1 | 190 | NMHC | 0.036 |
| | | | $NO_X$ | 0.076 |
| | | | PM | 0.004 |
| | | | CO | 0.665 |
| Water Truck | 1 | 164 | NMHC | 0.031 |
| | | | $NO_X$ | 0.066 |
| | | | PM | 0.003 |
| | | | CO | 0.574 |
| Maintenance Lubrication Vehicle | 1 | 210 | NMHC | 0.040 |
| | | | $NO_X$ | 0.084 |
| | | | PM | 0.004 |
| | | | CO | 0.735 |
| Backhoe Loader | 1 | 153 | NMHC | 0.029 |
| | | | $NO_X$ | 0.061 |
| | | | PM | 0.003 |
| | | | CO | 0.536 |

| Construction Equipment | Number of Equipment | Rated Power* (kW) | Parameter | Emission (kg/hour) |
|---|---|---|---|---|
| Concrete Pump – Over Vehicle | 1 | 150 | NMHC | 0.029 |
| | | | $NO_X$ | 0.060 |
| | | | PM | 0.003 |
| | | | CO | 0.525 |
| Dump Truck | 7 | 210 | NMHC | 0.279 |
| | | | $NO_X$ | 0.588 |
| | | | PM | 0.029 |
| | | | CO | 5.145 |
| Dozer | 1 | 172 | NMHC | 0.033 |
| | | | $NO_X$ | 0.069 |
| | | | PM | 0.003 |
| | | | CO | 0.602 |
| Wheeled Excavator | 1 | 161 | NMHC | 0.031 |
| | | | $NO_X$ | 0.064 |
| | | | PM | 0.003 |
| | | | CO | 0.564 |
| Crawler Excavator | 5 | 161 | NMHC | 0.153 |
| | | | $NO_X$ | 0.322 |
| | | | PM | 0.016 |
| | | | CO | 2.818 |
| Bored Pile Machine | 1 | 260 | NMHC | 0.046 |
| | | | $NO_X$ | 0.098 |
| | | | PM | 0.005 |
| | | | CO | 0.854 |
| Grader | 1 | 135 | NMHC | 0.026 |
| | | | $NO_X$ | 0.054 |
| | | | PM | 0.003 |
| | | | CO | 0.473 |
| Hi-Up | 1 | 370 | NMHC | 0.046 |
| | | | $NO_X$ | 0.098 |
| | | | PM | 0.005 |
| | | | CO | 0.854 |
| Double Truck | 1 | 210 | NMHC | 0.046 |

| Construction Equipment | Number of Equipment | Rated Power* (kW) | Parameter | Emission (kg/hour) |
|---|---|---|---|---|
| | | | $NO_X$ | 0.098 |
| | | | PM | 0.005 |
| | | | CO | 0.854 |
| Tower Crane | 1 | 244 | NMHC | 0.046 |
| | | | $NO_X$ | 0.098 |
| | | | PM | 0.005 |
| | | | CO | 0.854 |
| ROC | 1 | 250 | NMHC | 0.046 |
| | | | $NO_X$ | 0.098 |
| | | | PM | 0.005 |
| | | | CO | 0.854 |
| Ground Cylinder | 1 | 250 | NMHC | 0.046 |
| | | | $NO_X$ | 0.098 |
| | | | PM | 0.005 |
| | | | CO | 0.854 |
| Telehandler | 2 | 75 | NMHC | 0.031 |
| | | | $NO_X$ | 0.065 |
| | | | PM | 0.003 |
| | | | CO | 0.810 |
| Transmixer Truck | 3 | 210 | NMHC | 0.120 |
| | | | $NO_X$ | 0.252 |
| | | | PM | 0.013 |
| | | | CO | 2.205 |
| Wheeled Loader | 2 | 153 | NMHC | 0.058 |
| | | | $NO_X$ | 0.122 |
| | | | PM | 0.006 |
| | | | CO | 1.071 |

* *Values of similar projects were referenced.*

**Table 171: Total Pollutant Emissions Originated from the Construction Equipment**

| Parameter | Total Calculated Emission (kg/hour) | Threshold Value Defining Modelling Study Requirement by the Turkish Regulation (kg/hour) |
|---|---|---|
| NMHC | 1.15 | 3 |
| $NO_X$ | 2.43 | 4 |
| PM | 0.12 | 1 |
| CO | 21.49 | 50 |

Since the amount of each pollutant emission originated from the construction equipment is below the threshold value for the air emission dispersion modelling requirement defined by the Turkish Regulation (Table 2.1 in Annex-2 of the SKHKKY), air quality modelling study was not conducted for these pollutants.

### *Gaseous emissions from the emergency generators*

During construction phase of the Project, generators will only be used in case of emergency. The number of generators planned working hours per year, and planned locations of these generators are given in Table 172.

**Table 172: Information on Emergency Generators (construction phase)**

| Number of Generators | Type of Generator | Planned Working Location | Anticipated Running Hours for Each Generator (hour/year) |
|---|---|---|---|
| 3 | Stationary | Campsite | 200 |
| 2 | Stationary | Sub-construction Sites | 300 |
| 4 | Mobile | Underpasses and overpasses defined in ESIA report | 400 |
| 7 | Mobile | Concrete Batching Plants, Asphalt Plants, Mechanical Plants | 300 |

According to Annex-5 of the Air Pollution Regulation, emission standards are not applied for emergency power systems (which are not operated continuously, are put into operation in case of any malfunction or power failure and are taken out of operation when these situations disappear and are used up to a maximum of 500 hours per year). As per the information provided by the Project Company all the generators are used temporarily and during emergency situation and as per the planned running hours, all generators will be used less than 500 hours/year. Therefore, these generators are not subject to regulatory emission limits however, Project Company is obliged to submit to the competent authorities a report on such use in each year.

#### 7.1.6.2.2 Operation Phase

During operation phase, gaseous emissions may emerge from the following activities:

- Gaseous emissions from the vehicles
- Gaseous emissions from the emergency generators

***Gaseous emissions from the vehicles***

During the operation phase, the emission sources will be the vehicles using the motorway route. Although there are many pollutants in the exhaust emissions of vehicles, the most important pollutant parameters will be Particulate Matter (PM), $SO_2$, $NO_X$ and VOC.

According to the traffic load projections per year provided by the Client, the types and expected numbers of vehicles using the motorway per day were calculated and are presented below.

**Table 173: Types and Expected Numbers of Vehicles Using the Motorway on Daily Basis Over Years**

| Years | Vehicle Types (vehicle/day) | | | | | |
|---|---|---|---|---|---|---|
| | Car | Truck 2-axles | Truck 3-axles | Truck 4/5-axles | Truck 6+axles | Motorcycle |
| **2025** | 5,764 | 1,005 | 274 | 2,144 | 4,568 | 42 |
| **2026** | 7,903 | 1,061 | 242 | 1,904 | 4,056 | 51 |
| **2027** | 11,247 | 1,099 | 251 | 1,979 | 4,215 | 69 |
| **2028** | 12,395 | 1,280 | 291 | 2,291 | 4,880 | 75 |
| **2029** | 15,047 | 1,339 | 303 | 2,383 | 5,077 | 91 |
| **2030** | 16,323 | 1,398 | 314 | 2,476 | 5,273 | 98 |
| **2031** | 17,599 | 1,457 | 326 | 2,568 | 5,470 | 104 |
| **2032** | 18,874 | 1,516 | 338 | 2,660 | 5,667 | 111 |
| **2033** | 20,150 | 1,575 | 350 | 2,753 | 5,864 | 118 |
| **2034** | 21,425 | 1,634 | 361 | 2,845 | 6,060 | 125 |
| **2035** | 22,135 | 1,694 | 375 | 2,949 | 6,283 | 129 |
| **2036** | 22,861 | 1,756 | 388 | 3,057 | 6,513 | 134 |
| **2037** | 23,578 | 1,821 | 403 | 3,169 | 6,751 | 138 |
| **2038** | 24,311 | 1,887 | 417 | 3,285 | 6,998 | 142 |
| **2039** | 25,035 | 1,956 | 433 | 3,406 | 7,255 | 146 |
| **2040** | 25,770 | 2,028 | 449 | 3,530 | 7,521 | 151 |

Considering that the expected number of vehicles increases every year, the year 2040, when the number of vehicles is expected to higher than the other years and emissions are projected to be highest, has been taken into account in the modelling studies to account for the worst-case scenario (see Table 174).

**Table 174: Daily average number of vehicle projections in 2040**

| Type of Vehicle | Daily average number of vehicle projections in 2040 |
|---|---|
| Car | 25,770 |
| Truck (2-axles) | 2,028 |
| Truck (3-axles) | 449 |
| Truck (4/5-axles) | 3,530 |
| Truck (6+axles) | 7,521 |
| Motorcycle | 151 |
| **Total** | **39,449** |

EMEP/EEA air pollutant emission inventory guidebook 2023- 1.A.3.b.i-iv Exhaust emissions from road transport was used to calculate the emissions from vehicles. A per the guidebook, the following equivalents are used to find the emission factors of trucks:

- Truck (2-axles) = Heavy-Duty Vehicles - Rigid 14 - 20 ton
- Truck (3-axles) = Heavy-Duty Vehicles - Articulated 20 - 28 ton
- Truck (4/5-axles) = Heavy-Duty Vehicles - Articulated 35 - 40 ton
- Truck (6+axles) = Heavy-Duty Vehicles - Articulated 40 - 50 ton

The following assumptions are also made by determining the emission factors given in the Table 175

- According to TUIK data, the average age of vehicles in Turkey as of the end of 2023 is calculated as 14.5 years. Since the projection for the year 2040 is made for the Project and taking TUIK data as reference, the average model year of the vehicles in 2040 will be 2024. Therefore, Tier-2 emission factors are used considering the average vehicle age in Turkey.
- In the EMEP/EEA air pollutant emission inventory guidebook 2023- 1.A.3.b.i-iv it is stated that “The Tier 2 emission factors have been calculated based on average driving and temperature conditions for the EU-27 in 2018. These emission factors assume average urban, rural and highway driving mileage shares and speeds for the EU-27”, therefore, in this study, it is assumed that the vehicles will have average speed determined for motorway.
- All trucks are diesel fuelled.
- In the study, cars and motorcycles were assumed to run on gasoline and diesel. Alternative fuels, such as electric vehicles, were excluded due to insufficient data on their potential use. However, by 2039, vehicle emissions are expected to decrease significantly as diesel and gasoline-powered vehicles are progressively replaced by electric and low-emission hybrid alternatives. Consequently, emissions and the air quality contribution values calculated for 2039 are anticipated to be much lower than current estimates. Nonetheless, these assumptions were not incorporated into the modeling to ensure the worst-case scenario was accounted for.
- When determining the emission factors for each vehicle, the highest emission factor was considered

**Table 175: Emission factors of vehicles (EMEP/EEA air pollutant emission inventory guidebook 2023- 1.A.3.b)***

| Vehicle Type | Emission Factor (g/km) | | | |
|---|---|---|---|---|
| | PM | CO | VOC | NOx |
| | PM2.5=PM10=TSP | | Given as THC-CH4 equivalent | Given as NO2 equivalent. |
| Cars | 0.0004 | 0.3970 | 0.0440 | 0.0320 |
| Trucks | 0.0046 | 0.1560 | 0.0300 | 0.2610 |
| Motorcycle | 0.0120 | 4.3490 | 1.0270 | 0.0380 |

*Since the fuel standard in force in the EU since January 1, 2009 stipulates a maximum sulphur content of 10 mg/kg (0.1%) for diesel fuel, there is no sulphur emission factor in EMEP/EEA Air Pollutant Emission Inventory Guidelines Section 1.A.3.

Considering the route of the Project (150 km), emissions from the vehicles are calculated and given in the Table 176.A sample calculation is given below:

PM Emission for Cars (kg/hour): Number of Cars (per day) x Length of the Road (km) x Emission Factor (g/km) / 24 h per day / 1000 g/kg

PM Emission for Cars (kg/hour): 25770 /day x 150 km x 0.0004 g/km / 24 h per day / 1000 g/kg = 0.0644 kg/h

**Table 176: Emissions during Operation Phase**

| Vehicle Type | Number of Vehicles | PM | | CO | | VOC | | NOx | |
|---|---|---|---|---|---|---|---|---|---|
| | | E.F.* (g/km) | Emission (kg/h) | E.F (g/km) | Emission (kg/h) | E.F (g/km) | Emission (kg/h) | E.F (g/km) | Emission (kg/h) |
| Car | 25,770 | 0.0004 | 0.0644 | 0.3970 | 6.3942 | 0.0440 | 7.0868 | 0.0320 | 5.1540 |
| Truck | 13,528 | 0.0046 | 0.3847 | 0.1560 | 1.3190 | 0.0300 | 2.5365 | 0.2610 | 22.0676 |
| Motorcycle | 151 | 0.0120 | 0.0113 | 4.3490 | 0.4104 | 1.0270 | 0.9692 | 0.0380 | 0.0359 |
| **Total** | **39,449** | | **0.4605** | | **8.1236** | | **10.5925** | | **27.2574** |

*E.F.= Emission Factor

### *Gaseous emissions from the emergency generators*

During operation phase of the Project, generators will only be used in case of emergency. The number of generators planned working hours per year, and planned locations of these generators are given in Table 177.

**Table 177: Information on Emergency Generators (operation phase)**

| Number of Generators | Type of Generator | Planned Working Location | Anticipated Running Hours for Each Generator (hour/year |
|---|---|---|---|
| 2 | Stationary | Operation and Maintenance Center | 200 |
| 6 | Stationary | Motorway Service Facilities | 300 |

According to Annex-5 of the Air Pollution Regulation, emission standards are not applied for emergency power systems (which are not operated continuously, are put into operation in case of any malfunction or power failure and are taken out of operation when these situations disappear and are used up to a maximum of 500 hours per year). As per the information provided by the Project Company all the generators are used temporarily and during emergency situation and as per the planned running hours, all generators will be used less than 500 hours/year. Therefore, these generators are not subject to regulatory emission limits however, Project Company is obliged to submit to the competent authorities a report on such use in each year.

## *7.1.6.3 Modelled Scenarios*

### 7.1.6.3.1 Construction Phase

Excavation and backfilling amounts are different for various locations along the motorway. Therefore, the modelling studies have been conducted differently for each section.

The “American Meteorological Society/Environmental Protection Agency Regulatory Model” (AERMOD) software models contribution values to air pollution up to a maximum of 50 km. For this reason, the modelling study has been carried out by dividing the motorway route into sections smaller than 50 km.

Within the scope modelling studies, the quarries that will provide raw materials to the Project, concrete plants, mechanical plants, asphalt plants and storage areas are evaluated cumulatively.

Due to the abovementioned technical constraints (50 km) in AERMOD, modelling studies were carried out in 6 different domains namely “Scenario”. In scenarios different study areas are determined for;

- In Scenario 1, one additional Study Area (namely Study Area 2) is determined for Çanta-1 and Çanta-2 borrow pits and Storage Area-2 located approximately 7 km north of km 5+250 of the motorway route
- In Scenario 4, two separate study area (namely Study Area 5 and Study Area 6) is determined for Danamandıra-1 and Danamandıra-2 quarries located approximately 23 km northeast of km 00+000 of the motorway route.

The emission sources in these scenarios are presented in Table 178.

**Table 178: Modelled Scenarios for Construction Phase**

| Scenarios | Study Areas | Sources |
|---|---|---|
| **Scenario -1** | Study Area -1 | ▪ Earthworks between 00 km and 35 km<br>▪ Storage Area-1, Storage Area-3, Storage Area-4, Storage Area-5 and Storage Area-6<br>▪ Türkgücü-1, Türkgücü-2 and Türkgücü-3 Borrow Pits<br>▪ Concrete Batching Plant-1<br>▪ Asphalt Plant-1<br>▪ Mechanical Plant-1 |
| | Study Area -2 | ▪ Çanta-1 and Çanta-2 Borrow Pits<br>▪ Storage Area-2 |
| **Scenario -2** | Study Area -3 | ▪ Earthworks between 35 km and 70 km<br>▪ Storage Area-6, Storage Area-7, Storage Area-8, Storage Area-9, Storage Area-10 and Storage Area-11<br>▪ Türkgücü-1, Türkgücü-2 ve Türkgücü-3 Borrow Pits<br>▪ Osmanlı Quarry<br>▪ Concrete Batching Plant -2 |
| **Scenario -3** | Study Area -4 | ▪ Earthworks between 70 km and105 km<br>▪ Storage Area-10, Storage Area-11, Storage Area-12, Storage Area-13, Storage Area-14 and Storage Area-15<br>▪ İnecik Kuzey-1, İnecik Kuzey-2, İnecik Güney-1, İnecik Güney-2, Akçahalil-1, Akçahalil-2 and Akçahalil-3 Borrrow Pits<br>▪ Dereköy Quarry<br>▪ Concrete Batching Plant -3<br>▪ Asphalt Plant -2<br>▪ Mechanical Plant -2 |
| **Scenario -4** | Study Area -5 | Danamandıra-1 Quarry |
| | Study Area -6 | Danamandıra-2 Quarry |
| **Scenario -5** | Study Area -7 | Muratlı Quarry |
| **Scenario -6** | Study Area -8 | Tepeköy Quarry |

#### 7.1.6.3.2 Operation Phase

The AERMOD software models contribution values to air pollution up to a maximum of 50 km. For this reason, the modelling study has been carried out by dividing the motorway route into sections smaller than 50 km.

Same study areas with construction phase are used where practical. Air pollution contribution values for PM, CO, VOC and NOX were calculated for each study area.

Since EMEP/EEA Air Pollutant Emission Inventory Guideline Section 1.A.3 accepts PM2.5=PM10=TSP, the contribution value to air pollution was modelled only for PM10 and the calculated values were accepted as PM2.5.

The detailed information regarding scenarios, study areas and pollutants are given in Table 179.

**Table 179: Modelled Scenarios for Operation Phase**

| Scenarios | Study Areas | Pollutant | Sources |
|---|---|---|---|
| Scenario -7.a | Study Area -1 | PM10 - PM2.5 | Vehicles Between 00 km and 35 km |
| Scenario -7.b | Study Area -1 | CO | Vehicles Between 00 km and 35 km |
| Scenario -7.c | Study Area -1 | VOC | Vehicles Between 00 km and 35 km |
| Scenario -7.d | Study Area -1 | NOx | Vehicles Between 00 km and 35 km |
| Scenario -8.a | Study Area -3 | PM10 - PM2.5 | Vehicles Between 35 km and 70 km |
| Scenario -8.b | Study Area -3 | CO | Vehicles Between 35 km and 70 km |
| Scenario -8.c | Study Area -3 | VOC | Vehicles Between 35 km and 70 km |
| Scenario -8.d | Study Area -3 | NOx | Vehicles Between 35 km and 70 km |
| Scenario -9.a | Study Area -4 | PM10 - PM2.5 | Vehicles Between 70 km and 105 km |
| Scenario -9.b | Study Area -4 | CO | Vehicles Between 70 km and 105 km |
| Scenario -9.c | Study Area -4 | VOC | Vehicles Between 70 km and 105 km |
| Scenario -9.d | Study Area -4 | NOx | Vehicles Between 70 km and 105 km |

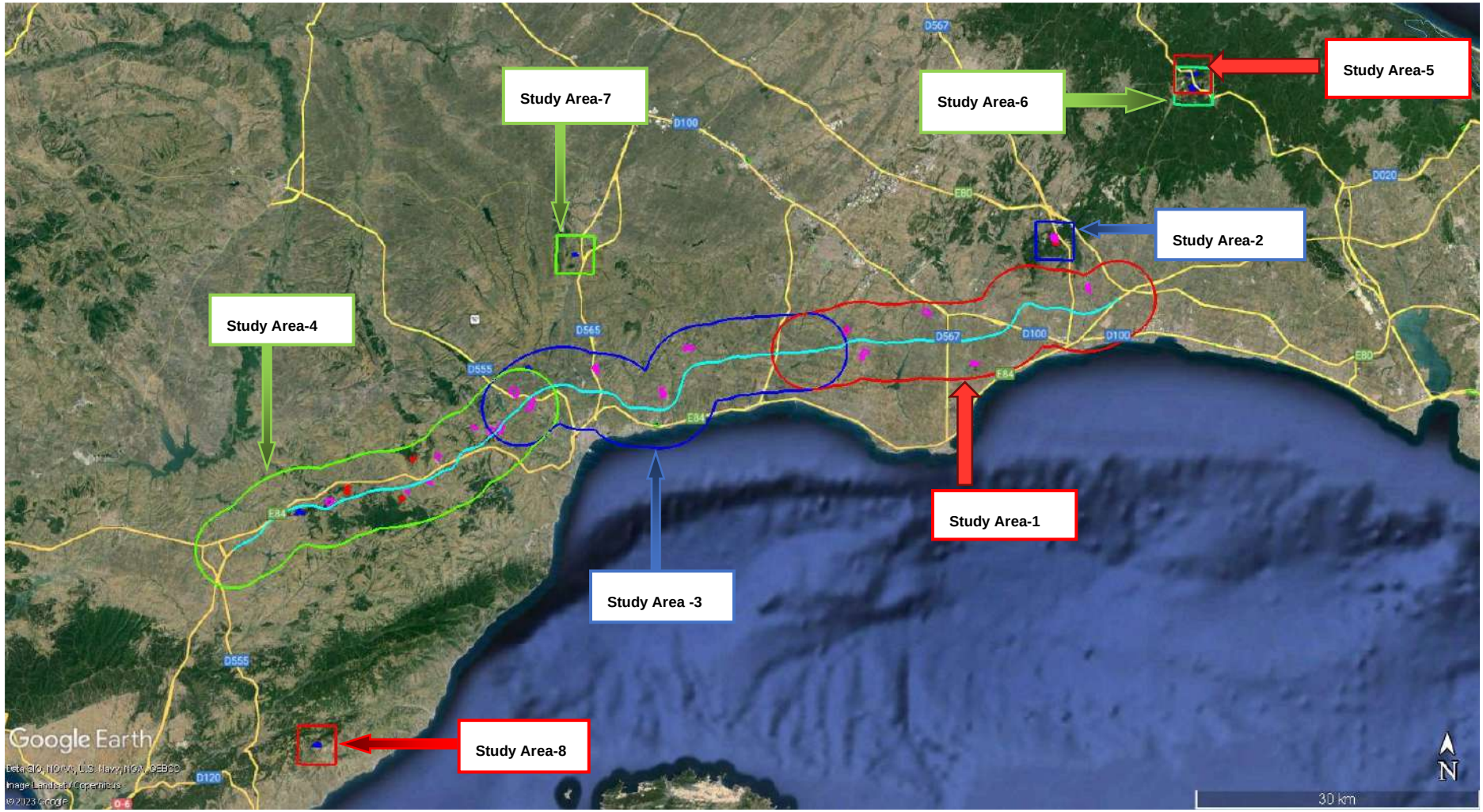



**Figure 228: Air Modelling Areas for Each Study Area**

### 7.1.6.4 Air Quality Modelling Methodology

The construction phase emissions were calculated, and atmospheric dispersion of air pollutants were simulated by AERMOD. AERMOD is a steady-state Gaussian dispersion model that represents the current state-of-the-science and preferred dispersion model of the U.S. EPA (U.S. Environmental Protection Agency). The model forecasts dispersion of the pollutants in the atmosphere, through mathematical formulations[183] which take into account the 1) hourly meteorological data (for at least one-year period), 2) topographical data for the modelling domain and receptor network, and 3) pollutant source data, which are described below in detail.

AERMOD, together with these data, estimates the concentration of pollutants at specified ground-level receptors surrounding an emissions source. AERMOD model is capable of calculating both short-term and long-term averages for any user-defined period.

AERMOD atmospheric dispersion modelling system includes 3 modules. These are;

- AERMOD
- AERMAP, and
- AERMET.

**AERMOD** is a linear, steady state Plume modelling. It also has Gaussian Plume characteristics. AERMOD Modelling system can be applied in many different resource types. It incorporates advanced algorithms such as plume rise and buoyancy, penetration in the rising inversion, surface level at the source, vertical profile of the winds, turbulence and heat, land effect. The performance of the AERMOD program may vary according to the land topography and different emission sources. It can give realistic results at high concentrations.

**AERMAP** is a terrain pre-processor. Its main purpose is to provide a physical relationship between air pollution behaviour and terrain properties. It generates position and elevation data for each peak location.

**AERMET** is a meteorological data pre-processor. It accepts surface meteorological data and upper atmosphere layer data. AERMET calculates the atmospheric parameters required for the dispersion model such as atmospheric turbulence characteristics, friction velocity and heights. AERMOD requires hourly meteorological data in the upper atmosphere layer to simulate pollutant dispersion.

The dispersion maps are presented in the Appendix F.

### 7.1.6.5 Receptors and Topography

As described, AoI should be divided into scenarios due to the model constraints and receptors for each modelling area are determined as per the nature of the receptor and emission source.

When determining the modelling area and receptors for Study Area-1, Study Area-3, and Study Area-4 , firstly four parallel lines were drawn at each 250-meter intervals on the right and left sides of the line (the motorway line to be excavated and filled is in the centre), and then three parallel lines were drawn at 1,000-meter intervals. Receptors are defined at 500 meters intervals on the parallel lines drawn on the right and left (upper and lower depending on the position of the line) of the line (Figure 229). Thus, modelling workspace of 4,000 meters for one side and 8,000 meters in total was determined (Figure 230).

A square area with a side length of 4 km has been selected as modelling area for Study Area-2, Study Area-5, Study Area-6, Study Area-7 and Study Area-8 These areas were divided into 16 sub-modelling areas with a side length of 1 km, and 144 peaks were formed by determining the points where the 500 m radius, drawn on

[183]https://www3.epa.gov/scram001/7thconf/aermod/aermod_mfd.pdf

the emission source with successive angles of 10 degrees clockwise, cuts the arc remaining in the 16 square-shaped area.

Total of 4206 receptors were identified for modelling studies as follows:

- 1307 receptors for Scenario-1 (including 1163 receptors for Study Area-1 and 144 receptors for Study Area-2),
- 1160 receptors for Scenario-2 (including Study Area-3),
- 1163 receptors for Scenario-3 (including Study Area-4),
- 288 receptors for Scenario-4 (including 144 receptors for Study Area-5 and 144 receptors for Study Area-6),
- 144 receptors for Scenario-5 (including Study Area-7), and
- 144 receptors for Scenario-7 (including Study Area-8),

Thus, the settlements on both the right and left (both upper and lower depending on the position of the line) of the line will be defined as a receptor.

The modelling area and receptor points determined in the scope of the air quality dispersion modelling study are given in Figure 231, Figure 232, Figure 233, Figure 234, Figure 235 and Figure 236.

Also, the coordinates of the measurement points and the points where the contribution values to air pollution are calculated, which are defined as discrete receptors in the model runs, are given in Table 180.

**Table 180: Coordinates of Discrete Receptors (Sensitive Receptors) Included in the Model**

| Discrete Receptor | Coordinates (WGS84, UTM Zone 35) | |
|---|---|---|
| | X | Y |
| AQ - 1 | 506304 | 4525649 |
| AQ - 2 | 507026 | 4525865 |
| AQ - 3 | 512447 | 4524860 |
| AQ - 4 | 508327 | 4528503 |
| AQ - 5 | 511329 | 4529048 |
| AQ - 6 | 512481 | 4527410 |
| AQ - 7 | 514647 | 4529428 |
| AQ - 8 | 517267 | 4531152 |
| AQ - 9 | 518048 | 4529257 |
| AQ - 10 | 520889 | 4531560 |
| AQ - 11 | 523258 | 4530892 |
| AQ - 12 | 523424 | 4532271 |
| AQ - 13 | 525104 | 4531792 |
| AQ - 14 | 526810 | 4533248 |
| AQ - 15 | 527803 | 4532372 |

| Discrete Receptor | Coordinates (WGS84, UTM Zone 35) | |
|---|---|---|
| | X | Y |
| AQ - 16 | 529586 | 4535472 |
| AQ - 17 | 526412 | 4540054 |
| AQ - 18 | 529123 | 4539993 |
| AQ - 19 | 531279 | 4536789 |
| AQ - 20 | 532720 | 4533451 |
| AQ - 21 | 531830 | 4540355 |
| AQ - 22 | 536037 | 4539504 |
| AQ - 23 | 536539 | 4538863 |
| AQ - 24 | 537824 | 4539890 |
| AQ - 25 | 539411 | 4540869 |
| AQ - 26 | 540434 | 4541505 |
| AQ - 27 | 540971 | 4541733 |
| AQ - 28 | 543152 | 4541306 |
| AQ - 29 | 544184 | 4540051 |
| AQ - 30 | 544146 | 4541848 |
| AQ - 31 | 545253 | 4541473 |
| AQ - 32 | 546711 | 4539397 |
| AQ - 33 | 548595 | 4539816 |
| AQ - 34 | 548702 | 4539432 |
| AQ - 35 | 549591 | 4541426 |
| AQ - 36 | 550732 | 4538571 |
| AQ - 37 | 552631 | 4538392 |
| AQ - 38 | 553205 | 4542666 |
| AQ - 39 | 552391 | 4544142 |
| AQ - 40 | 555979 | 4543689 |
| AQ - 41 | 560252 | 4541820 |
| AQ - 42 | 562560 | 4548340 |
| AQ - 43 | 568345 | 4548605 |
| AQ - 44 | 569553 | 4546810 |
| AQ - 45 | 570179 | 4544497 |
| AQ - 46 | 571561 | 4544339 |
| AQ - 47 | 574485 | 4548016 |

| Discrete Receptor | Coordinates (WGS84, UTM Zone 35) | |
|---|---|---|
| | X | Y |
| AQ - 48 | 575243 | 4549478 |
| AQ - 49 | 578865 | 4549326 |
| AQ - 50 | 576553 | 4551925 |
| AQ - 51 | 576083 | 4547951 |
| AQ - 52 | 580170 | 4547562 |
| AQ - 53 | 580496 | 4543970 |
| AQ - 54 | 580800 | 4538257 |
| AQ - 55 | 584542 | 4543854 |
| AQ - 56 | 585305 | 4548356 |
| AQ - 57 | 588165 | 4548686 |
| AQ - 58 | 586482 | 4550068 |
| AQ - 59 | 588893 | 4551243 |
| AQ - 60 | 588814 | 4554537 |
| AQ - 61 | 590046 | 4559119 |
| AQ - 62 | 591885 | 4549968 |
| AQ - 63 | 594479 | 4549787 |
| AQ - 64 | 596095 | 4549550 |
| AQ - 65 | 595540 | 4551890 |
| AQ - 66 | 599081 | 4551537 |

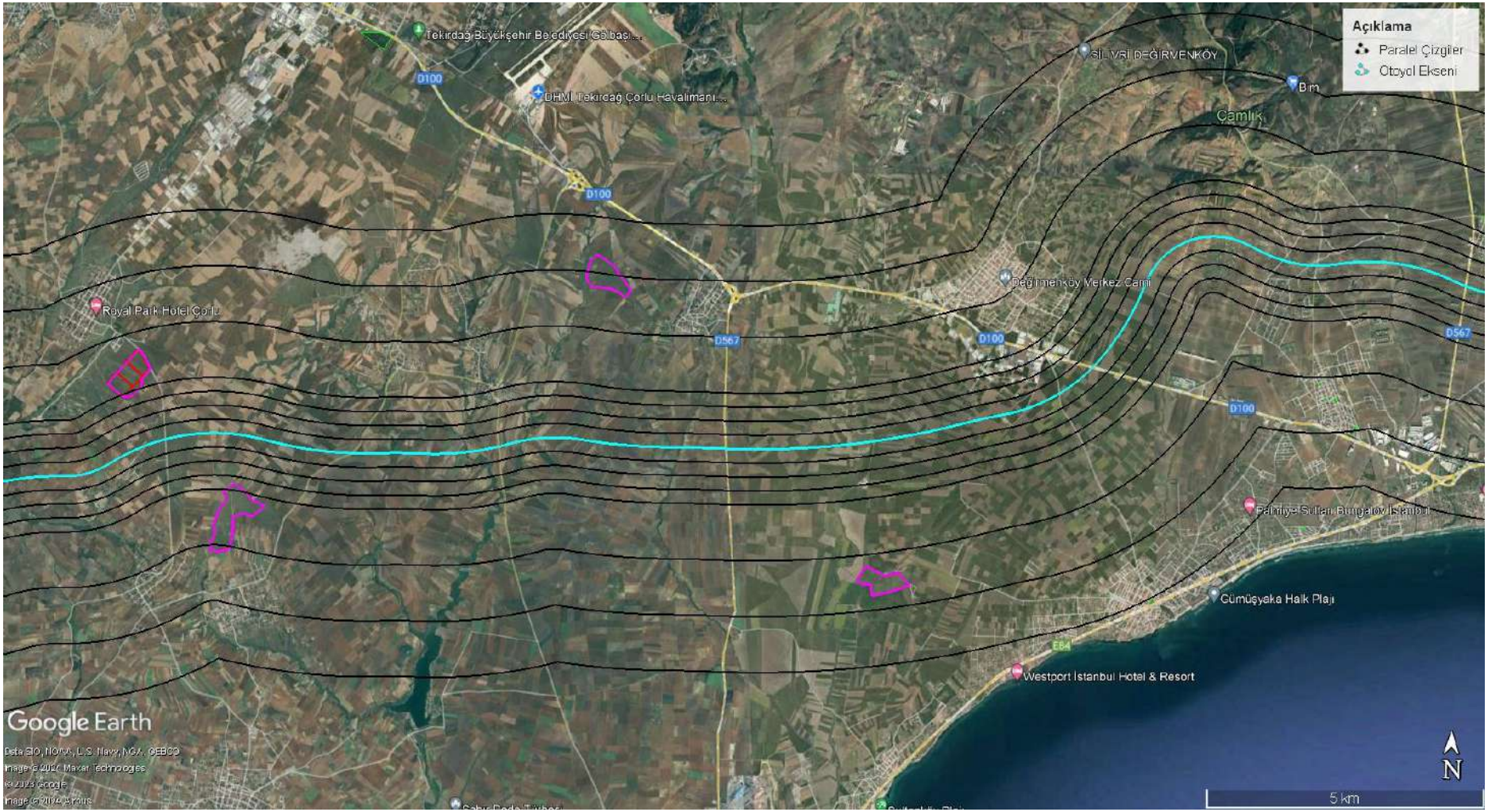



**Figure 229: Motorway and Parallel Receptor Lines Used in the Model**

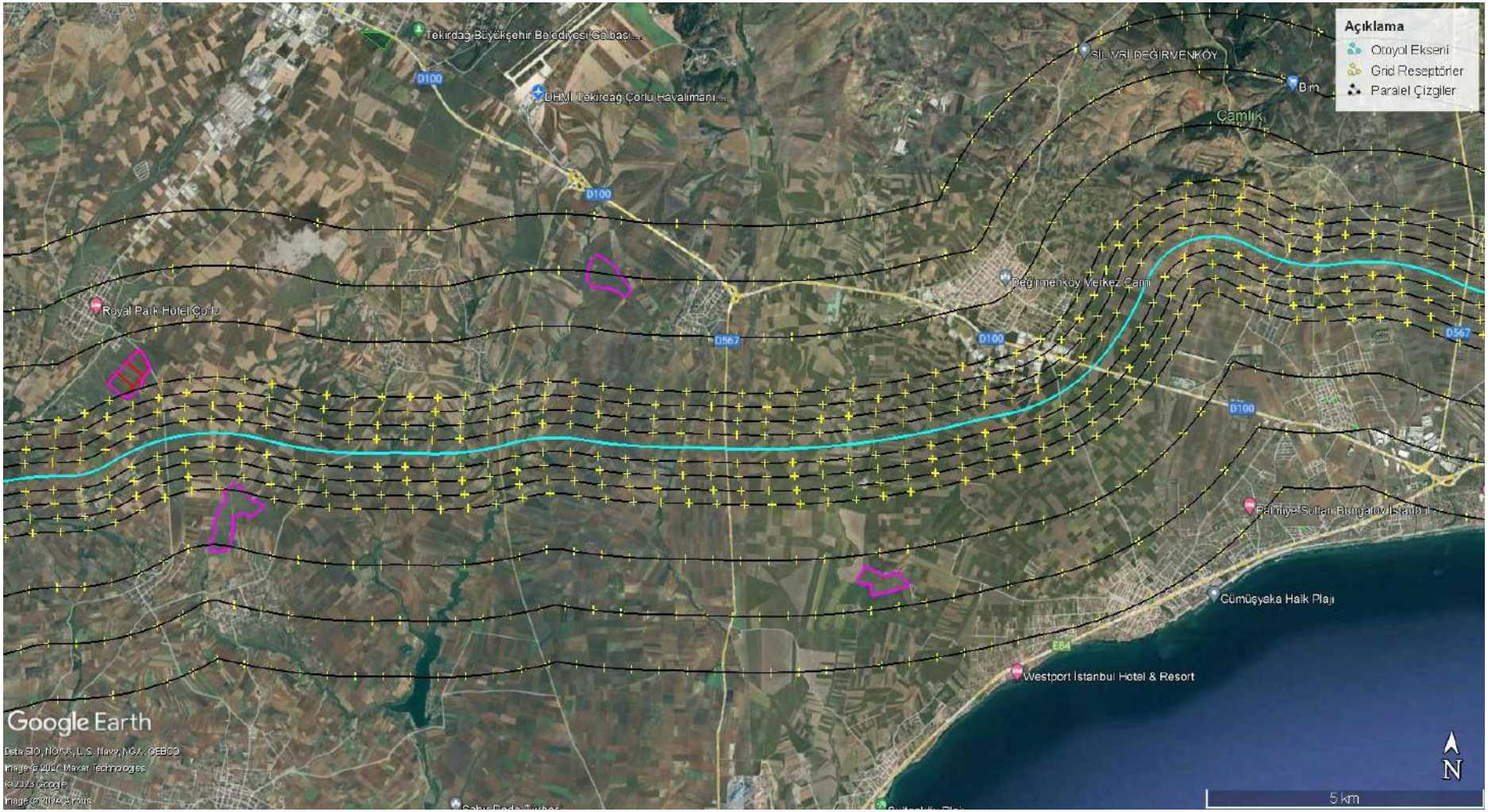



**Figure 230: Grid Receptors Used in the Model**




**Figure 231: Scenario-1: Study Area 1 (between 00 km – 35 km) and Study Area 2 (Çanta-1 and Çanta-2 Borrow Pits , Storage Area-2)**

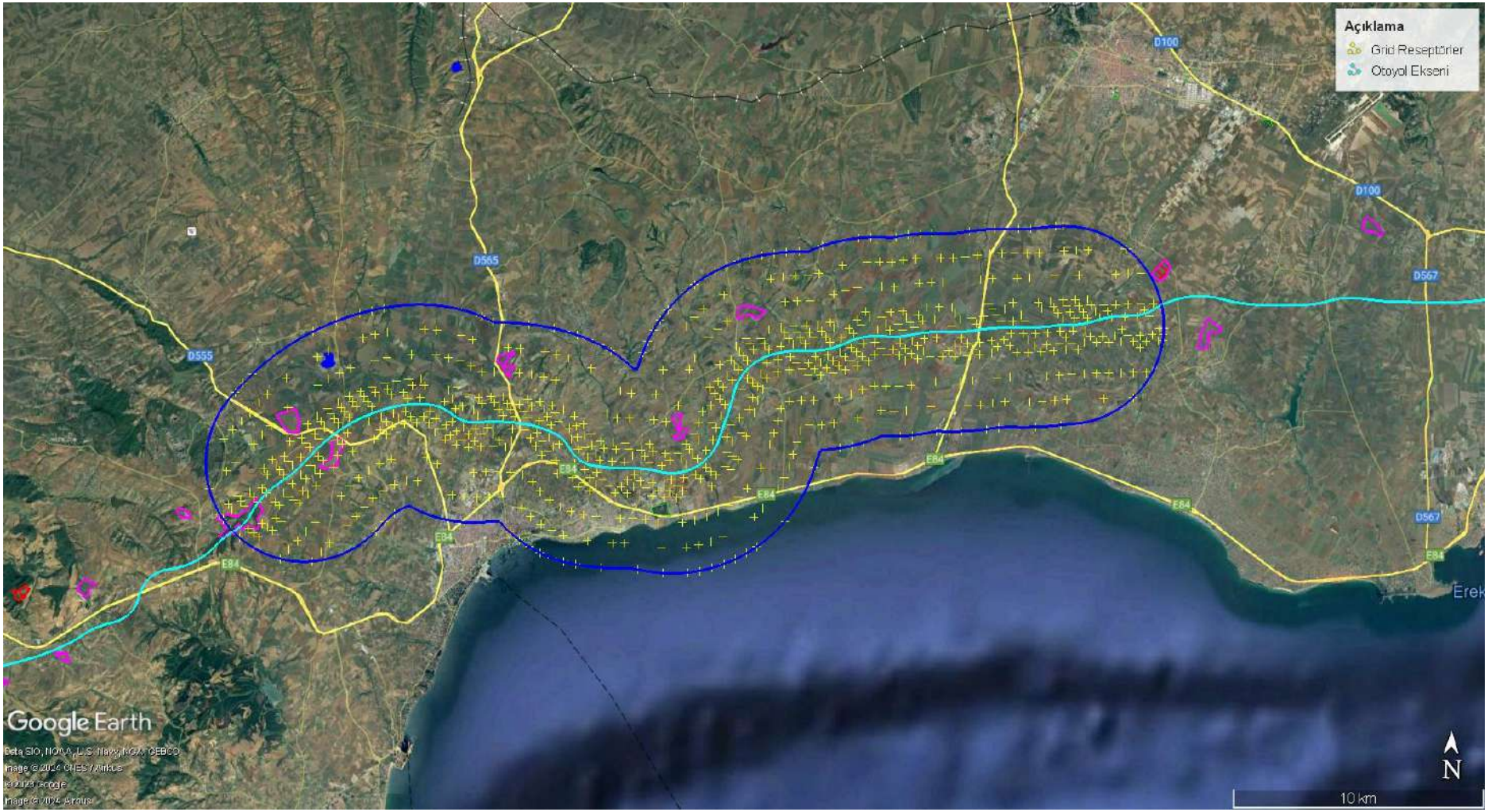



**Figure 232: Scenario 2: Study Area 3 (between 35 km – 70 km)**

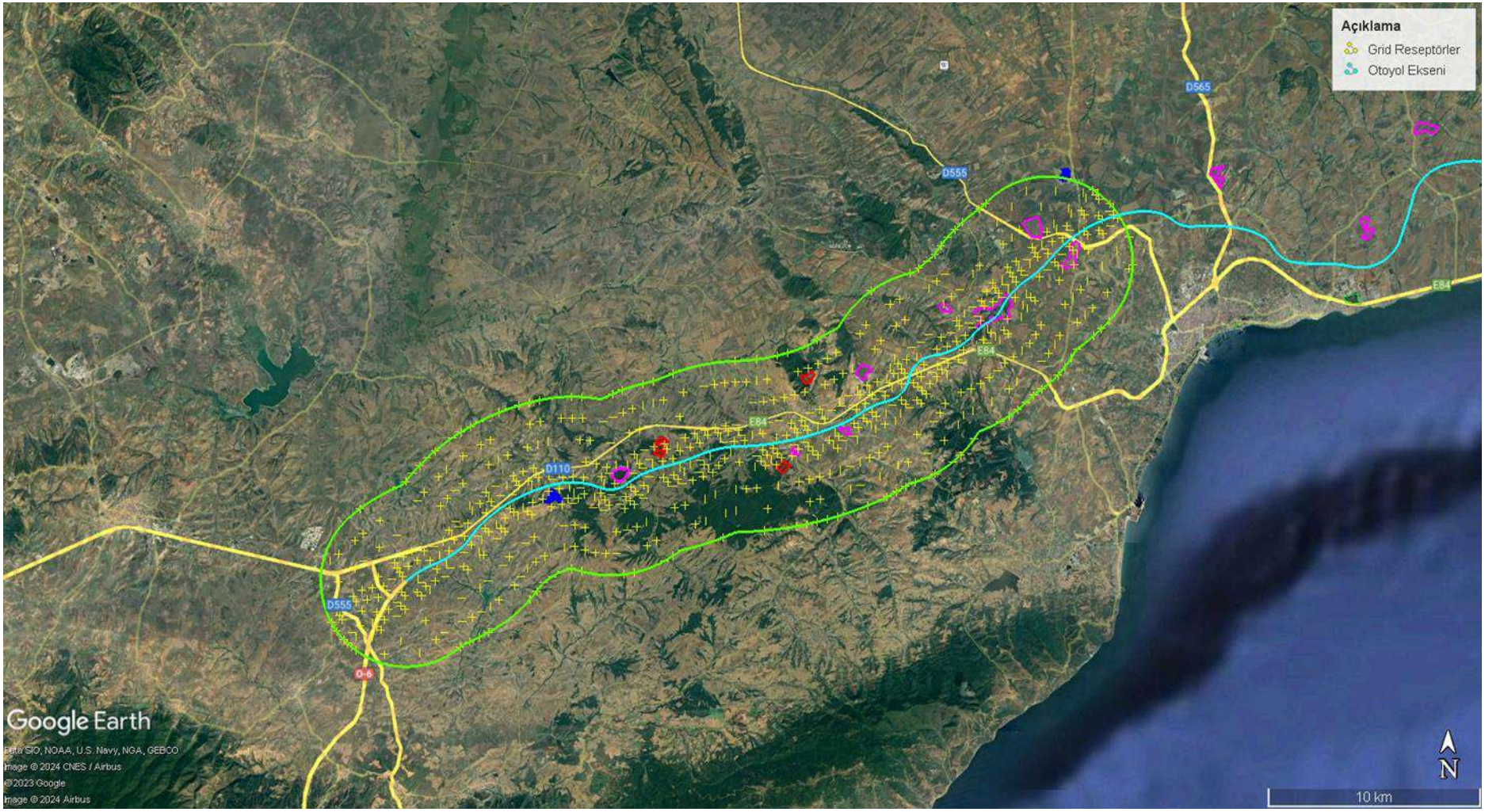



**Figure 233: Scenario-3: Study Area-4 (between 70 km and 105 km)**

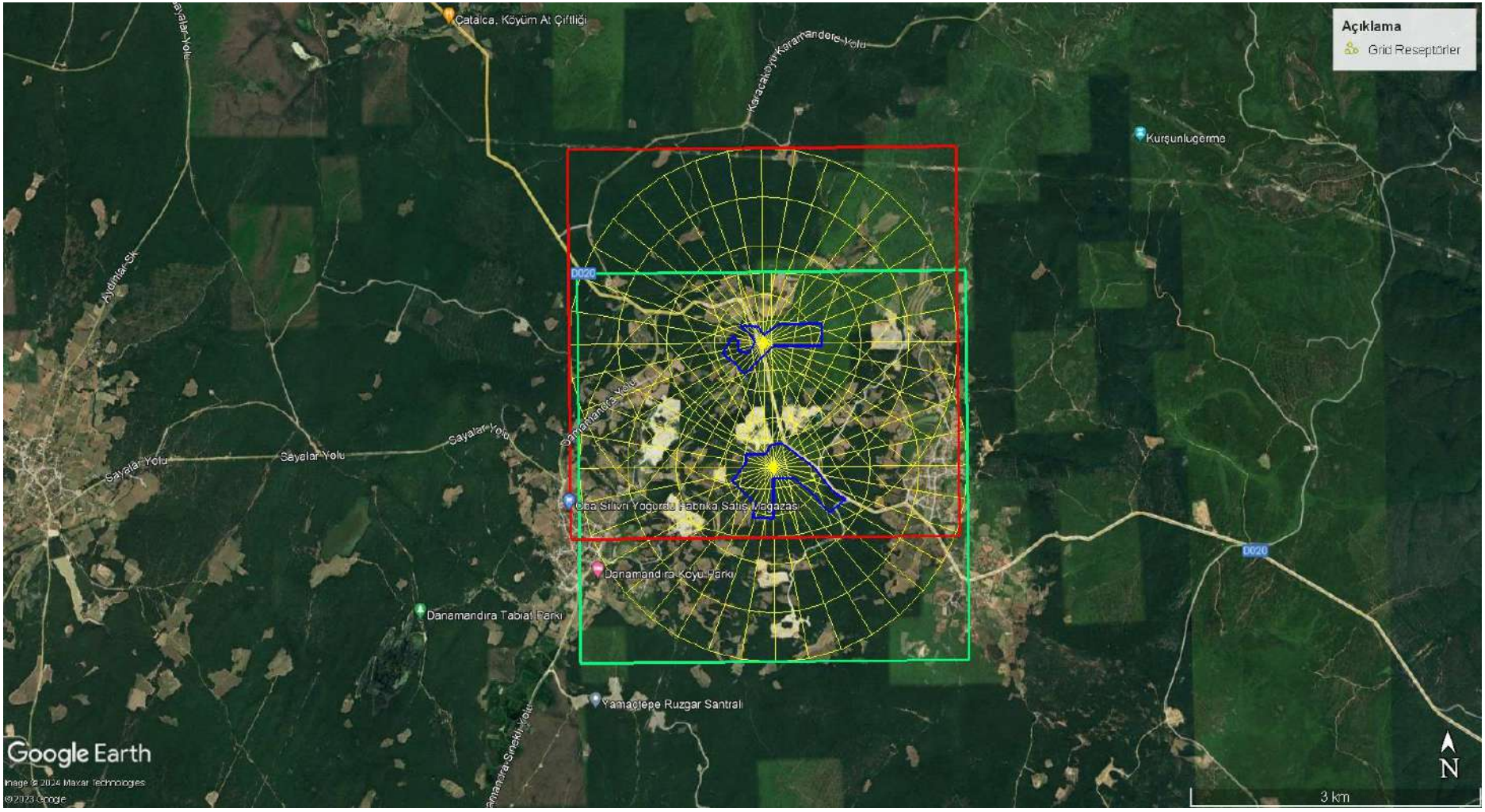



**Figure 234: Scenario-4: Study Area- 5 (Danamandıra 1 Quarry) and Study Area-6 (Danamandıra-2 Quarry)**




**Figure 235: Scenario-5: Study Area-7 (Muratlı Quarry)**

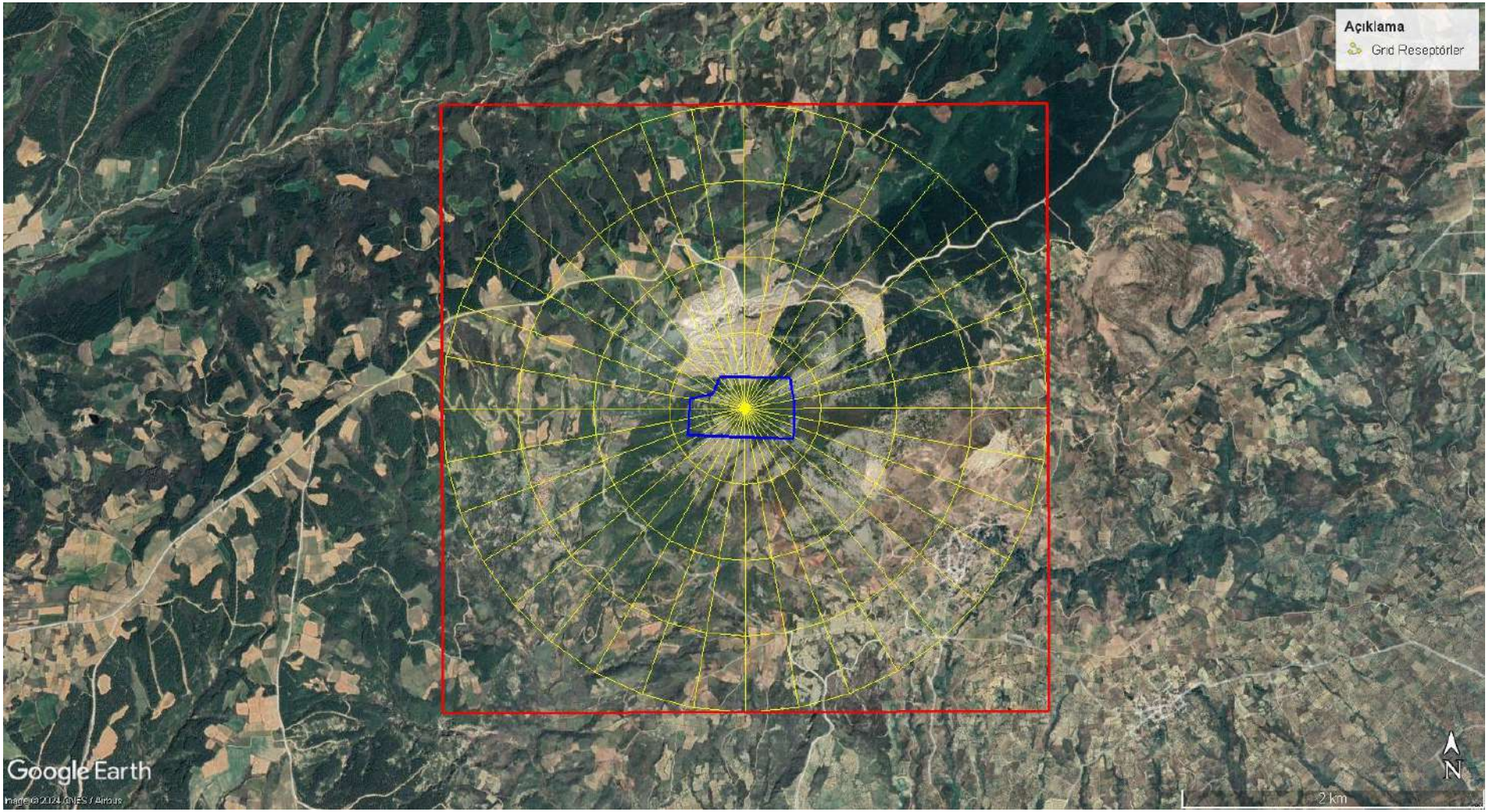



**Figure 236: Scenario-6: Study Area-8 (Tepeköy Quarry)**

### 7.1.6.6 Meteorological Data

AERMOD model uses “hourly meteorological” data in order to define rising of the pollutant cloud, movement and accumulation. AERMET, the meteorological pre-processor of AERMOD model, requires two types of meteorological data inputs: hourly surface observations and twice-daily upper air soundings.

To produce AERMET required data files; meteorological data are obtained from existing meteorology stations in the region. For the AERMOD model, hourly surface station data measured at air conditioning, synoptic or automatic type stations and meteorological sounding data measured at rawinsonde type stations are required. Hourly meteorological data sets were obtained from the representative meteorological stations close to the area and the upper air sounding data set was obtained from Istanbul Regional Meteorology Station. Regional characteristics, such as surface roughness coefficient, Bowen ratio and albedo have been determined with regards to EPA AERMET user manual.

Meteorological data was obtained from Çorlu Airport Meteorological Station, Tekirdağ Meteorological Station and Malkara Meteorological Station for different sections of the motorway (Table 181 and Figure 237). Upper atmospheric data is obtained from İstanbul Regional Meteorological Station.

**Table 181: Meteorological Stations Determined as Representative for Each Scenario (Modelling Areas)**

| Scenario No | Selected Representative Meteorological Station |
|---|---|
| Scenario-1 | Çorlu Airport Meteorological Station |
| Scenario-2 | Tekirdağ Meteorological Station |
| Scenario-3 | Malkara Meteorological Station |
| Scenario-4 | Çorlu Airport Meteorological Station |
| Scenario-5 | Tekirdağ Meteorological Station |
| Scenario-6 | Malkara Meteorological Station |
| Scenario -7 (including 7.a, 7.b, 7.c and 7.d) | Çorlu Airport Meteorological Station |
| Scenario -8 (including 8.a, 8.b, 8.c and 8.d) | Tekirdağ Meteorological Station |
| Scenario -9 (including 9.a, 9.b, 9.c and 9.d) | Malkara Meteorological Station |

The annual and long-term wind roses are presented in below figure. The representative years for meteorological data were identified based on the wind direction distribution diagrams. According to the evaluations which were performed based on the comparisons of the yearly wind direction distributions of the last 10 years with the long-term wind direction distributions, determination of representative years for meteorological data acquisition from each meteorological stations were completed and the representative year’s wind distribution diagrams are illustrated in below figure.

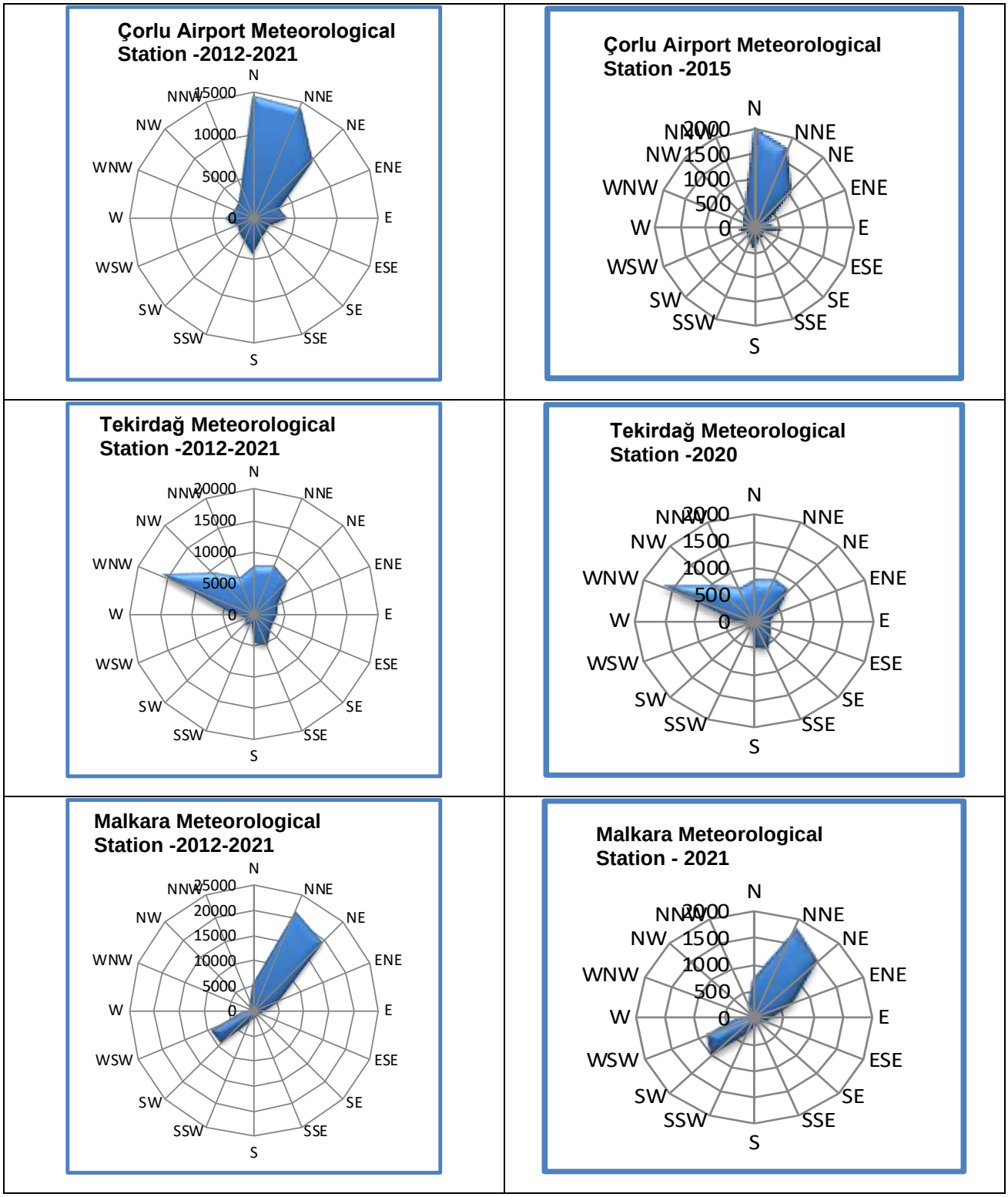



**Figure 237: Wind Rose Belonging to Selected Representative Year for Each Meteorological Station**

### 7.1.6.7 Impact Analysis

#### 7.1.6.7.1 Construction Phase

Impact analysis has been conducted by using AERMOD modelling results for settled dust, $PM_{10}$, and $PM_{2.5}$, and also cumulative assessment are given in below sections in detail.

#### Settled Dust Parameter Modelling Results

The highest modelling results for settled dust and the coordinates where the highest 24-hourly and yearly concentrations were predicted are presented in Table 182 for all the scenarios. It can be seen that all the settled dust modelling results for all scenarios are way below the limit values given in Air Pollution Regulation. The maximum modelled 24-hourly and yearly settled dust concentrations are calculated as 60.15 mg/m$^2$/day and 6.15 mg/m$^2$/day, respectively.

**Table 182: Modelling Results for Settled Dust Parameter**

| Scenario | Averaging Period | Modelling Results (mg/m$^2$/day) | Coordinates (X; Y) | Limit Value (Air Pollution Regulation) |
|---|---|---|---|---|
| Scenario -1 (Study Area-1 and Study Area-2) | 24 Hourly | 60.15 | 584229.52; 4547374.07 | 390 mg/m$^2$/day |
| | Yearly | 6.15 | 584229.52; 4547374.07 | 210 mg/m$^2$/day |
| Scenario -2 (Study Area-3) | 24 Hourly | 6.99 | 554116.84; 4541960.93 | 390 mg/m$^2$/day |
| | Yearly | 0.73 | 554116.84; 4541960.93 | 210 mg/m$^2$/day |
| Scenario -3 (Study Area-4) | 24 Hourly | 34.76 | 525205.54; 4531128.80 | 390 mg/m$^2$/day |
| | Yearly | 2.68 | 535918.27; 4543179.83 | 210 mg/m$^2$/day |
| Scenario -4 (Study Area-5 and Study Area-6) | 24 Hourly | 30.13 | 605765.35; 4575569.81 | 390 mg/m$^2$/day |
| | Yearly | 5.75 | 605850.00; 4574358.00 | 210 mg/m$^2$/day |
| Scenario -5 (Study Area-7) | 24 Hourly | 3.70 | 540200.61; 4555055.98 | 390 mg/m$^2$/day |
| | Yearly | 0.35 | 540200.61; 4555055.98 | 210 mg/m$^2$/day |
| Scenario -6 (Study Area-8) | 24 Hourly | 6.09 | 514914.02; 4504016.39 | 390 mg/m$^2$/day |
| | Yearly | 0.88 | 514147.98; 4503373.61 | 210 mg/m$^2$/day |

#### $PM_{10}$ Parameter Modelling Results

The 1$^{st}$ and 35$^{th}$ highest modelling results for $PM_{10}$ and the coordinates where the highest 24-hourly and yearly concentrations were estimated are presented in Table 183 for all the scenarios. The PM10 modelling results presented in this section show the ground level concentrations expected to be caused from the Project related

activities. The total ground level concentrations, which includes the baseline measurement results, are assessed under “Cumulative Assessment of Modelling Results on Sensitive Receptors” sub-heading.

For 24-hourly results it is seen that the maximum $PM_{10}$ concentrations for all the scenarios are below the limit value as well as the IFC standard of 50 µg/m$^3$ except Scenario-3. In Scenario-3, the limit value was exceeded for 2 times which is under the number of exceedances (35 times) defined in the regulations. In addition, the yearly average $PM_{10}$ concentrations estimated for all the scenarios are below the limit values as well as the IFC standard. The maximum modelled 24-hourly and yearly $PM_{10}$ concentrations are calculated as 71.26 µg/m$^3$ and 3.04 µg/m$^3$ respectively.

**Table 183: Modelling Results for $PM_{10}$ Parameter**

| Scenario | Averaging Period | Criteria | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Turkish[1] | EU[2] | IFC[3]* |
| Scenario-1 (Study Area-1 and Study Area-2) | 24 Hourly | 1st Maximum | 38.43 | 590825.60; 4557762.18 | 50 | 50 | 50 |
| | | 35th Maximum | 11.04 | 584229.52; 4547374.07 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 3.04 | 584229.52; 4547374.07 | 40 | 40 | 20 |
| Scenario-2 (Study Area-3) | 24 Hourly | 1st Maximum | 15.52 | 536296.42; 4542847.23 | 50 | 50 | 50 |
| | | 35th Maximum | 2.06 | 543519.57; 4543080.03 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 0.67 | 568487.59; 4547882.33 | 40 | 40 | 20 |
| Scenario-3 (Study Area-4) | 24 Hourly | 1st Maximum | 71.26 | 525205.54; 4531128.80 | 50 | 50 | 50 |
| | | 35th Maximum | 9.60 | 535918.27; 4543179.83 | | | |
| | | Number of Exceedance | 2 | 525205.54; 4531128.80 | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 2.96 | 535918.27; 4543179.83 | 40 | 40 | 20 |

| Scenario | Averaging Period | Criteria | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Turkish[1] | EU[2] | IFC[3] * |
| Scenario -4 (Study Area-5 and Study Area-6) | 24 Hourly | 1st Maximum | 29.84 | 605446.60; 4574671.82 | 50 | 50 | 50 |
| | | 35th Maximum | 6.88 | 605765.35; 4575569.81 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 2.46 | 605850.00; 4574358.00 | 40 | 40 | 20 |
| Scenario -5 (Study Area-7) | 24 Hourly | 1st Maximum | 19.52 | 540022.00; 4555439.00 | 50 | 50 | 50 |
| | | 35th Maximum | 0.92 | 540088.99; 4555689.00 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 0.33 | 540052.15; 4555610.01 | 40 | 40 | 20 |
| Scenario -6 (Study Area-8) | 24 Hourly | 1st Maximum | 20.79 | 514038.60; 4503781.82 | 50 | 50 | 50 |
| | | 35th Maximum | 3.58 | 514209.61; 4503311.98 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 1.24 | 514147.98; 4503373.61 | 40 | 40 | 20 |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)

[2] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air

[3] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)

* The IFC limit value for yearly $PM_{10}$ is taken as 40 µg/m³ in line with Turkish and EU standards.

## $PM_{2.5}$ Emission Modelling Results

The highest modelling results for $PM_{2.5}$ and the coordinates where the highest 24-hourly and yearly concentrations were calculated are presented in Table 184 for all the scenarios. The PM2.5 modelling results presented in this section show the ground level concentrations expected to be caused from the Project related activities. The total

ground level concentrations, which includes the baseline measurement results, are assessed under “Cumulative Assessment of Modelling Results on Sensitive Receptors” sub-heading.

It can be seen that all the $PM_{2.5}$ modelling results for all scenarios are way below the regulatory limit values and the IFC standards. The maximum modelled 24-hourly and yearly $PM_{2.5}$ concentrations are calculated as 14.83 µg/m$^3$ and 0.92 µg/m$^3$ respectively.

**Table 184: Modelling Results for $PM_{2.5}$ Parameter**

| Scenario | Averaging Period | Result (µg/m$^3$) | Coordinates (X; Y) | Limit Values (µg/m$^3$) | |
|---|---|---|---|---|---|
| | | | | IFC | EU |
| Scenario -1 (Study Area-1 and Study Area-2) | 24 Hourly | 9.84 | 590825,60; 4557762,18 | 25 | - |
| | Yearly | 0.92 | 584229,52; 4547374,07 | 10 | 20 |
| Scenario -2 (Study Area-3) | 24 Hourly | 3.85 | 536296,42; 4542847,23 | 25 | - |
| | Yearly | 0.17 | 554116,84; 4541960,93 | 10 | 20 |
| Scenario -3 (Study Area-4) | 24 Hourly | 14.83 | 525205,54; 4531128,80 | 25 | - |
| | Yearly | 0.88 | 535918,27; 4543179,83 | 10 | 20 |
| Scenario -4 (Study Area-5 and Study Area-6) | 24 Hourly | 9.99 | 605446,60; 4574671,82 | 25 | - |
| | Yearly | 0.75 | 605850,00; 4574358,00 | 10 | 20 |
| Scenario -5 (Study Area-7) | 24 Hourly | 8.25 | 540022,00; 4555439,00 | 25 | - |
| | Yearly | 0.10 | 540052,15; 4555610,01 | 10 | 20 |
| Scenario -6 (Study Area-8) | 24 Hourly | 7.36 | 514061,15; 4503523,99 | 25 | - |
| | Yearly | 0.36 | 514147,98; 4503373,61 | 10 | 20 |

### *Cumulative Assessment of Modelling Results on Sensitive Receptors*

The yearly and 24-hourly model results for the pollutant parameters are given in Table 185 for the 66 discrete receptors defined in the model. In Table 186, the model results for ground level concentrations of $PM_{10}$, $PM_{2.5}$ and settled dust are provided together with the background air quality concentrations and cumulative values that has been observed by adding up the model results with the background concentrations. The estimated ambient air quality values have been compared with the relevant regulatory limit values and IFC standards.

When the cumulative results are examined, it is seen that all the cumulative results are below both the regulatory limit and IFC standard.

The dispersion maps are presented in the Appendix F.

**Table 185: Modelling Results at Sensitive Receptors**

| Receptor | PM10 (µg/m$^3$) | | PM 2.5 (µg/m$^3$) | | Settled Dust (mg/m$^2$/day) | |
|---|---|---|---|---|---|---|
| | 24-Hourly PM10 | Yearly PM10 | 24-Hourly PM2.5 | Yearly PM2.5 | 24-Hourly Settled Dust | Yearly Settled Dust |
| AQ - 1 | 1.368 | 0.047 | 0.584 | 0.018 | 0.210 | 0.017 |
| AQ - 2 | 1.696 | 0.052 | 0.727 | 0.020 | 0.270 | 0.020 |
| AQ - 3 | 0.480 | 0.075 | 0.174 | 0.024 | 0.210 | 0.047 |
| AQ - 4 | 2.489 | 0.047 | 0.997 | 0.019 | 0.280 | 0.013 |
| AQ - 5 | 5.088 | 0.104 | 1.532 | 0.035 | 1.070 | 0.030 |
| AQ - 6 | 4.167 | 0.190 | 1.708 | 0.065 | 1.120 | 0.081 |
| AQ - 7 | 3.806 | 0.276 | 1.205 | 0.086 | 1.430 | 0.109 |
| AQ - 8 | 9.011 | 0.420 | 2.192 | 0.122 | 4.500 | 0.170 |
| AQ - 9 | 3.084 | 0.131 | 0.864 | 0.047 | 0.640 | 0.049 |
| AQ - 10 | 2.711 | 0.175 | 1.094 | 0.062 | 0.590 | 0.065 |
| AQ - 11 | 8.133 | 0.423 | 2.291 | 0.133 | 1.990 | 0.144 |
| AQ - 12 | 6.618 | 0.295 | 1.822 | 0.097 | 1.490 | 0.135 |
| AQ - 13 | 26.801 | 0.709 | 9.054 | 0.232 | 5.320 | 0.233 |
| AQ - 14 | 4.768 | 0.221 | 1.008 | 0.070 | 1.340 | 0.120 |
| AQ - 15 | 1.792 | 0.129 | 0.607 | 0.045 | 0.470 | 0.060 |
| AQ - 16 | 0.645 | 0.098 | 0.216 | 0.031 | 0.280 | 0.073 |
| AQ - 17 | 0.967 | 0.029 | 0.369 | 0.010 | 0.190 | 0.013 |
| AQ - 18 | 1.849 | 0.087 | 0.600 | 0.034 | 0.190 | 0.025 |
| AQ - 19 | 0.537 | 0.076 | 0.185 | 0.024 | 0.210 | 0.053 |
| AQ - 20 | 1.200 | 0.052 | 0.467 | 0.019 | 0.160 | 0.019 |
| AQ - 21 | 1.903 | 0.142 | 0.833 | 0.053 | 0.210 | 0.045 |
| AQ - 22 | 1.081 | 0.068 | 0.555 | 0.024 | 0.370 | 0.035 |
| AQ - 23 | 1.212 | 0.049 | 0.650 | 0.018 | 0.230 | 0.025 |
| AQ - 24 | 1.530 | 0.046 | 0.950 | 0.018 | 0.190 | 0.021 |

| Receptor | PM10 (µg/m$^3$) | | PM 2.5 (µg/m$^3$) | | Settled Dust (mg/m$^2$/day) | |
|---|---|---|---|---|---|---|
| | 24-Hourly PM10 | Yearly PM10 | 24-Hourly PM2.5 | Yearly PM2.5 | 24-Hourly Settled Dust | Yearly Settled Dust |
| AQ - 25 | 1.368 | 0.039 | 0.625 | 0.014 | 0.190 | 0.017 |
| AQ - 26 | 0.797 | 0.039 | 0.234 | 0.013 | 0.140 | 0.018 |
| AQ - 27 | 2.295 | 0.039 | 0.791 | 0.013 | 0.190 | 0.024 |
| AQ - 28 | 1.733 | 0.080 | 0.580 | 0.027 | 0.410 | 0.026 |
| AQ - 29 | 0.618 | 0.043 | 0.228 | 0.015 | 0.130 | 0.013 |
| AQ - 30 | 1.260 | 0.044 | 0.542 | 0.015 | 0.360 | 0.018 |
| AQ - 31 | 2.354 | 0.077 | 0.950 | 0.027 | 0.350 | 0.018 |
| AQ - 32 | 1.255 | 0.053 | 0.530 | 0.020 | 0.120 | 0.015 |
| AQ - 33 | 1.951 | 0.087 | 0.599 | 0.031 | 0.360 | 0.044 |
| AQ - 34 | 1.026 | 0.070 | 0.454 | 0.025 | 0.370 | 0.041 |
| AQ - 35 | 5.444 | 0.538 | 1.053 | 0.151 | 1.970 | 0.259 |
| AQ - 36 | 1.602 | 0.071 | 0.562 | 0.026 | 0.330 | 0.020 |
| AQ - 37 | 1.392 | 0.060 | 0.632 | 0.023 | 0.230 | 0.015 |
| AQ - 38 | 2.118 | 0.110 | 0.641 | 0.034 | 0.400 | 0.032 |
| AQ - 39 | 1.502 | 0.098 | 0.458 | 0.032 | 0.370 | 0.045 |
| AQ - 40 | 1.481 | 0.072 | 0.665 | 0.026 | 0.190 | 0.014 |
| AQ - 41 | 0.972 | 0.038 | 0.487 | 0.016 | 0.060 | 0.008 |
| AQ - 42 | 4.504 | 0.049 | 1.819 | 0.020 | 0.200 | 0.009 |
| AQ - 43 | 9.919 | 0.659 | 2.491 | 0.177 | 3.060 | 0.209 |
| AQ - 44 | 1.380 | 0.126 | 0.410 | 0.040 | 3.750 | 0.207 |
| AQ - 45 | 0.458 | 0.077 | 0.138 | 0.024 | 1.540 | 0.138 |
| AQ - 46 | 2.877 | 0.095 | 0.820 | 0.030 | 1.550 | 0.096 |
| AQ - 47 | 1.656 | 0.040 | 0.649 | 0.014 | 0.240 | 0.016 |
| AQ - 48 | 0.706 | 0.045 | 0.296 | 0.017 | 0.140 | 0.014 |
| AQ - 49 | 1.621 | 0.048 | 0.492 | 0.015 | 0.380 | 0.023 |

| Receptor | PM10 (µg/m$^3$) | | PM 2.5 (µg/m$^3$) | | Settled Dust (mg/m$^2$/day) | |
|---|---|---|---|---|---|---|
| | 24-Hourly PM10 | Yearly PM10 | 24-Hourly PM2.5 | Yearly PM2.5 | 24-Hourly Settled Dust | Yearly Settled Dust |
| AQ - 50 | 0.432 | 0.020 | 0.143 | 0.006 | 0.220 | 0.013 |
| AQ - 51 | 1.079 | 0.046 | 0.464 | 0.016 | 0.190 | 0.036 |
| AQ - 52 | 0.612 | 0.030 | 0.255 | 0.010 | 0.110 | 0.015 |
| AQ - 53 | 0.833 | 0.027 | 0.303 | 0.009 | 0.210 | 0.025 |
| AQ - 54 | 0.554 | 0.017 | 0.212 | 0.006 | 0.090 | 0.019 |
| AQ - 55 | 1.687 | 0.038 | 0.598 | 0.013 | 0.310 | 0.037 |
| AQ - 56 | 3.711 | 0.057 | 1.036 | 0.018 | 1.180 | 0.042 |
| AQ - 57 | 0.659 | 0.020 | 0.243 | 0.007 | 0.190 | 0.017 |
| AQ - 58 | 2.262 | 0.035 | 0.711 | 0.011 | 0.310 | 0.022 |
| AQ - 59 | 0.838 | 0.018 | 0.325 | 0.006 | 0.130 | 0.022 |
| AQ - 60 | 0.289 | 0.027 | 0.089 | 0.009 | 0.350 | 0.041 |
| AQ - 61 | 2.840 | 0.064 | 0.890 | 0.021 | 1.270 | 0.038 |
| AQ - 62 | 0.687 | 0.020 | 0.242 | 0.007 | 0.130 | 0.019 |
| AQ - 63 | 0.625 | 0.028 | 0.229 | 0.009 | 0.220 | 0.029 |
| AQ - 64 | 0.917 | 0.015 | 0.346 | 0.005 | 0.200 | 0.010 |
| AQ - 65 | 2.639 | 0.051 | 0.795 | 0.016 | 1.210 | 0.043 |
| AQ - 66 | 0.153 | 0.006 | 0.071 | 0.002 | 0.050 | 0.003 |
| Highest Concentration | AQ-13-26.801 | AQ-13-0.709 | AQ-13-9.054 | AQ-13-0.232 | AQ-13-5.320 | AQ-35-0.259 |
| Turkish[1] | 50 | 40 | - | - | 390 | 210 |
| IFC[2] | 50 | 20 | 25 | 10 | - | - |
| EU[3] | 50 | 40 | - | 20 | - | - |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)

[2] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)

[3] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air

**Table 186: Cumulative Assessment of Air Quality (Total Ground Level Concentrations)**

| Sampling Point | $PM_{10}$ (µg/m³) | | | $PM_{2.5}$ (µg/m³) | | | Settled Dust (mg/m²/day) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Short Term | | | Long term | | |
| | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* |
| AQ - 1 | 17.10 | 1.37 | 18.47 | 9.40 | 0.58 | 9.98 | 98.42 | 0.21 | 98.63 | 94.99 | 0.02 | 95.01 |
| AQ - 2 | 25.60 | 1.70 | 27.30 | 10.50 | 0.73 | 11.23 | 111.89 | 0.27 | 112.16 | 104.20 | 0.02 | 104.22 |
| AQ - 3 | 25.80 | 0.48 | 26.28 | 10.20 | 0.17 | 10.37 | 100.61 | 0.21 | 100.82 | 93.83 | 0.05 | 93.88 |
| AQ - 4 | 21.50 | 2.49 | 23.99 | 12.30 | 1.00 | 13.30 | 87.69 | 0.28 | 87.97 | 82.36 | 0.01 | 82.37 |
| AQ - 5 | 20.70 | 5.09 | 25.79 | 6.90 | 1.53 | 8.43 | 101.71 | 1.07 | 102.78 | 94.27 | 0.03 | 94.30 |
| AQ - 6 | 21.30 | 4.17 | 25.47 | 4.20 | 1.71 | 5.91 | 110.25 | 1.12 | 111.37 | 102.22 | 0.08 | 102.30 |
| AQ - 7 | 25.40 | 3.81 | 29.21 | 10.40 | 1.21 | 11.61 | 77.70 | 1.43 | 79.13 | 70.85 | 0.11 | 70.96 |
| AQ - 8 | 19.90 | 9.01 | 28.91 | 5.90 | 2.19 | 8.09 | 93.10 | 4.50 | 97.60 | 83.72 | 0.17 | 83.89 |
| AQ - 9 | 16.60 | 3.08 | 19.68 | 9.70 | 0.86 | 10.56 | 67.28 | 0.64 | 67.92 | 61.29 | 0.05 | 61.34 |
| AQ - 10 | 22.30 | 2.71 | 25.01 | 8.30 | 1.09 | 9.39 | 93.79 | 0.59 | 94.38 | 86.19 | 0.07 | 86.26 |
| AQ - 11 | 16.70 | 8.13 | 24.83 | 9.40 | 2.29 | 11.69 | 83.71 | 1.99 | 85.70 | 79.28 | 0.14 | 79.42 |
| AQ - 12 | 16.80 | 6.62 | 23.42 | 8.80 | 1.82 | 10.62 | 95.98 | 1.49 | 97.47 | 87.44 | 0.14 | 87.58 |
| AQ - 13 | 22.10 | 26.80 | 48.90 | 9.10 | 9.05 | 18.15 | 87.34 | 5.32 | 92.66 | 80.31 | 0.23 | 80.54 |
| AQ - 14 | 22.00 | 4.77 | 26.77 | 9.10 | 1.01 | 10.11 | 92.31 | 1.34 | 93.65 | 84.88 | 0.12 | 85.00 |
| AQ - 15 | 21.70 | 1.79 | 23.49 | 10.10 | 0.61 | 10.71 | 67.94 | 0.47 | 68.41 | 63.89 | 0.06 | 63.95 |
| AQ - 16 | 25.10 | 0.64 | 25.74 | 9.50 | 0.22 | 9.72 | 101.67 | 0.28 | 101.95 | 92.78 | 0.07 | 92.85 |
| AQ - 17 | 21.60 | 0.97 | 22.57 | 11.90 | 0.37 | 12.27 | 78.76 | 0.19 | 78.95 | 73.66 | 0.01 | 73.67 |
| AQ - 18 | 16.10 | 1.85 | 17.95 | 9.70 | 0.60 | 10.30 | 93.81 | 0.19 | 94.00 | 87.08 | 0.03 | 87.11 |
| AQ - 19 | 21.80 | 0.54 | 22.34 | 9.40 | 0.18 | 9.58 | 79.69 | 0.21 | 79.90 | 73.93 | 0.05 | 73.98 |
| AQ - 20 | 24.00 | 1.20 | 25.20 | 10.50 | 0.47 | 10.97 | 69.72 | 0.16 | 69.88 | 64.96 | 0.02 | 64.98 |
| AQ - 21 | 23.40 | 1.90 | 25.30 | 10.20 | 0.83 | 11.03 | 72.28 | 0.21 | 72.49 | 67.64 | 0.05 | 67.69 |
| AQ - 22 | 23.20 | 1.08 | 24.28 | 10.80 | 0.56 | 11.36 | 79.22 | 0.37 | 79.59 | 74.54 | 0.04 | 74.58 |
| AQ - 23 | 17.40 | 1.21 | 18.61 | 11.20 | 0.65 | 11.85 | 64.03 | 0.23 | 64.26 | 59.92 | 0.03 | 59.95 |
| AQ - 24 | 16.60 | 1.53 | 18.13 | 12.30 | 0.95 | 13.25 | 60.08 | 0.19 | 60.27 | 56.66 | 0.02 | 56.68 |
| AQ - 25 | 21.80 | 1.37 | 23.17 | 10.30 | 0.62 | 10.92 | 69.97 | 0.19 | 70.16 | 65.48 | 0.02 | 65.50 |
| AQ - 26 | 23.10 | 0.80 | 23.90 | 8.90 | 0.23 | 9.13 | 83.27 | 0.14 | 83.41 | 77.92 | 0.02 | 77.94 |
| AQ - 27 | 24.30 | 2.29 | 26.59 | 10.50 | 0.79 | 11.29 | 72.49 | 0.19 | 72.68 | 68.99 | 0.02 | 69.01 |

| Sampling Point | $PM_{10}$ (µg/m³) | | | $PM_{2.5}$ (µg/m³) | | | Settled Dust (mg/m²/day) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Short Term | | | Long term | | |
| | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* |
| AQ - 28 | 24.10 | 1.73 | 25.83 | 8.10 | 0.58 | 8.68 | 78.71 | 0.41 | 79.12 | 74.07 | 0.03 | 74.10 |
| AQ - 29 | 23.00 | 0.62 | 23.62 | 7.40 | 0.23 | 7.63 | 83.68 | 0.13 | 83.81 | 79.40 | 0.01 | 79.41 |
| AQ - 30 | 25.40 | 1.26 | 26.66 | 9.90 | 0.54 | 10.44 | 73.96 | 0.36 | 74.32 | 69.79 | 0.02 | 69.81 |
| AQ - 31 | 22.60 | 2.35 | 24.95 | 9.70 | 0.95 | 10.65 | 86.78 | 0.35 | 87.13 | 81.99 | 0.02 | 82.01 |
| AQ - 32 | 16.60 | 1.25 | 17.85 | 11.20 | 0.53 | 11.73 | 75.59 | 0.12 | 75.71 | 70.46 | 0.02 | 70.48 |
| AQ - 33 | 24.30 | 1.95 | 26.25 | 8.60 | 0.60 | 9.20 | 67.57 | 0.36 | 67.93 | 63.62 | 0.04 | 63.66 |
| AQ - 34 | 24.90 | 1.03 | 25.93 | 10.30 | 0.45 | 10.75 | 80.89 | 0.37 | 81.26 | 76.23 | 0.04 | 76.27 |
| AQ - 35 | 24.00 | 5.44 | 29.44 | 12.50 | 1.05 | 13.55 | 88.18 | 1.97 | 90.15 | 82.92 | 0.26 | 83.18 |
| AQ - 36 | 22.30 | 1.60 | 23.90 | 13.30 | 0.56 | 13.86 | 80.07 | 0.33 | 80.40 | 74.82 | 0.02 | 74.84 |
| AQ - 37 | 15.80 | 1.39 | 17.19 | 12.00 | 0.63 | 12.63 | 70.43 | 0.23 | 70.66 | 65.50 | 0.02 | 65.52 |
| AQ - 38 | 25.30 | 2.12 | 27.42 | 11.40 | 0.64 | 12.04 | 75.70 | 0.40 | 76.10 | 72.02 | 0.03 | 72.05 |
| AQ - 39 | 25.60 | 1.50 | 27.10 | 9.20 | 0.46 | 9.66 | 79.04 | 0.37 | 79.41 | 75.47 | 0.05 | 75.52 |
| AQ - 40 | 21.80 | 1.48 | 23.28 | 11.10 | 0.66 | 11.76 | 84.86 | 0.19 | 85.05 | 80.37 | 0.01 | 80.38 |
| AQ - 41 | 16.80 | 0.97 | 17.77 | 9.40 | 0.49 | 9.89 | 88.65 | 0.06 | 88.71 | 82.83 | 0.01 | 82.84 |
| AQ - 42 | 22.40 | 4.50 | 26.90 | 10.80 | 1.82 | 12.62 | 76.84 | 0.20 | 77.04 | 70.43 | 0.01 | 70.44 |
| AQ - 43 | 24.00 | 9.92 | 33.92 | 11.60 | 2.49 | 14.09 | 93.25 | 3.06 | 96.31 | 84.70 | 0.21 | 84.91 |
| AQ - 44 | 24.40 | 1.38 | 25.78 | 12.40 | 0.41 | 12.81 | 83.18 | 3.75 | 86.93 | 75.78 | 0.21 | 75.99 |
| AQ - 45 | 24.90 | 0.46 | 25.36 | 11.80 | 0.14 | 11.94 | 89.73 | 1.54 | 91.27 | 82.47 | 0.14 | 82.61 |
| AQ - 46 | 23.10 | 2.88 | 25.98 | 9.70 | 0.82 | 10.52 | 85.68 | 1.55 | 87.23 | 81.14 | 0.10 | 81.24 |
| AQ - 47 | 20.30 | 1.66 | 21.96 | 12.90 | 0.65 | 13.55 | 94.32 | 0.24 | 94.56 | 88.21 | 0.02 | 88.23 |
| AQ - 48 | 14.80 | 0.71 | 15.51 | 11.00 | 0.30 | 11.30 | 73.37 | 0.14 | 73.51 | 69.00 | 0.01 | 69.01 |
| AQ - 49 | 23.80 | 1.62 | 25.42 | 10.40 | 0.49 | 10.89 | 85.78 | 0.38 | 86.16 | 80.26 | 0.02 | 80.28 |
| AQ - 50 | 23.30 | 0.43 | 23.73 | 10.60 | 0.14 | 10.74 | 82.02 | 0.22 | 82.24 | 77.17 | 0.01 | 77.18 |
| AQ - 51 | 23.50 | 1.08 | 24.58 | 7.50 | 0.46 | 7.96 | 88.61 | 0.19 | 88.80 | 84.07 | 0.04 | 84.11 |
| AQ - 52 | 19.50 | 0.61 | 20.11 | 8.50 | 0.25 | 8.75 | 81.74 | 0.11 | 81.85 | 77.22 | 0.02 | 77.24 |
| AQ - 53 | 18.90 | 0.83 | 19.73 | 9.30 | 0.30 | 9.60 | 96.09 | 0.21 | 96.30 | 90.37 | 0.03 | 90.40 |
| AQ - 54 | 15.10 | 0.55 | 15.65 | 7.90 | 0.21 | 8.11 | 86.47 | 0.09 | 86.56 | 80.81 | 0.02 | 80.83 |
| AQ - 55 | 20.00 | 1.69 | 21.69 | 7.80 | 0.60 | 8.40 | 68.99 | 0.31 | 69.30 | 64.17 | 0.04 | 64.21 |

| Sampling Point | $PM_{10}$ (µg/m³) | | | $PM_{2.5}$ (µg/m³) | | | Settled Dust (mg/m²/day) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Short Term | | | Long term | | |
| | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* |
| AQ - 56 | 19.90 | 3.71 | 23.61 | 9.00 | 1.04 | 10.04 | 77.07 | 1.18 | 78.25 | 72.73 | 0.04 | 72.77 |
| AQ - 57 | 15.10 | 0.66 | 15.76 | 10.00 | 0.24 | 10.24 | 74.34 | 0.19 | 74.53 | 69.96 | 0.02 | 69.98 |
| AQ - 58 | 22.10 | 2.26 | 24.36 | 9.00 | 0.71 | 9.71 | 72.86 | 0.31 | 73.17 | 67.59 | 0.02 | 67.61 |
| AQ - 59 | 21.00 | 0.84 | 21.84 | 8.50 | 0.32 | 8.82 | 60.08 | 0.13 | 60.21 | 56.66 | 0.02 | 56.68 |
| AQ - 60 | 13.50 | 0.29 | 13.79 | 9.00 | 0.09 | 9.09 | 77.77 | 0.35 | 78.12 | 72.77 | 0.04 | 72.81 |
| AQ - 61 | 15.30 | 2.84 | 18.14 | 8.30 | 0.89 | 9.19 | 71.43 | 1.27 | 72.70 | 66.58 | 0.04 | 66.62 |
| AQ - 62 | 23.50 | 0.69 | 24.19 | 7.30 | 0.24 | 7.54 | 83.64 | 0.13 | 83.77 | 78.83 | 0.02 | 78.85 |
| AQ - 63 | 19.40 | 0.63 | 20.03 | 7.60 | 0.23 | 7.83 | 92.69 | 0.22 | 92.91 | 88.19 | 0.03 | 88.22 |
| AQ - 64 | 21.30 | 0.92 | 22.22 | 6.20 | 0.35 | 6.55 | 102.26 | 0.20 | 102.46 | 94.02 | 0.01 | 94.03 |
| AQ - 65 | 14.40 | 2.64 | 17.04 | 7.50 | 0.79 | 8.29 | 82.51 | 1.21 | 83.72 | 77.21 | 0.04 | 77.25 |
| AQ - 66 | 20.40 | 0.15 | 20.55 | 10.30 | 0.07 | 10.37 | 92.31 | 0.05 | 92.36 | 84.88 | 0.00 | 84.88 |
| Highest CR Value | AQ-13-48.90 | | | AQ-13-18.15 | | | AQ-13-112.16 | | | AQ-13-104.22 | | |
| Turkish Legislation | 50 | | | - | | | 210 | | | 390 | | |
| IFC | 50 | | | 25 | | | - | | | - | | |
| EU | 50 | | | - | | | - | | | - | | |

*BC: Background Concentration, MR: Modelling Result, CR: Cumulative Result

#### 7.1.6.7.2 Operation Phase

### Settled Dust Parameter Modelling Results

The highest modelling results for settled dust and the coordinates where the highest 24-hourly and yearly concentrations were predicted are presented in Table 187 for all the scenarios. It can be seen that all the settled dust modelling results for all scenarios are way below the limit values given in Air Pollution Regulation. The maximum modelled 24-hourly and yearly settled dust concentrations are calculated as 0.02 mg/m²/day and 0.08 mg/m²/day, respectively.

**Table 187: Modelling Results for Settled Dust Parameter**

| Scenario | Averaging Period | Modelling Results (mg/m²/day) | Coordinates (X; Y) | Limit Value (Air Pollution Regulation) |
|---|---|---|---|---|
| Scenario - 7.a | 24 Hourly | 0.02 | 569835.75; 4547098.42 | 390 mg/m²/day |
| | Yearly | 0.008 | 585197.16; 4547625.50 | 210 mg/m²/day |

| Scenario | Averaging Period | Modelling Results (mg/m²/day) | Coordinates (X; Y) | Limit Value (Air Pollution Regulation) |
|---|---|---|---|---|
| Scenario -8.a | 24 Hourly | 0.02 | 546008.99; 4540086.67 | 390 mg/m²/day |
| | Yearly | 0.008 | 547804.31; 4539145.59 | 210 mg/m²/day |
| Scenario -9a | 24 Hourly | 0.02 | 528856.25; 4533506.06 | 390 mg/m²/day |
| | Yearly | 0.008 | 527884.44; 4532444.03 | 210 mg/m²/day |

## $PM_{10}$ Parameter Modelling Results

The 1st and 35th highest modelling results for $PM_{10}$ and the coordinates where the highest 24-hourly and yearly concentrations were estimated are presented in Table 188 for all the scenarios. The PM10 modelling results presented in this section show the ground level concentrations expected to be caused from the Project related activities. The total ground level concentrations, which includes the baseline measurement results, are assessed under “Cumulative Assessment of Modelling Results on Sensitive Receptors” sub-heading.

For 24-hourly results it is seen that the maximum $PM_{10}$ concentrations for all the scenarios are below the limit value as well as the IFC standard of 50 µg/m³. The maximum modelled 24-hourly and yearly $PM_{10}$ concentrations are calculated as 0.23 µg/m³ and 0.06 µg/m³ respectively.

**Table 188: Modelling Results for $PM_{10}$ Parameter**

| Scenario | Averaging Period | Criteria | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Turkish[1] | EU[2] | IFC[3] * |
| Scenario -7.a | 24 Hourly | 1st Maximum | 0.23 | 576265.77; 4547304.28 | 50 | 50 | 50 |
| | | 35th Maximum | 0.07 | 576265.77; 4547304.28 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 0.02 | 592073.81; 4550528.25 | 40 | 40 | 20 |
| Scenario -8.a | 24 Hourly | 1st Maximum | 0.21 | 547804.31; 4539145.59 | 50 | 50 | 50 |
| | | 35th Maximum | 0.12 | 547804.31; 4539145.59 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |

| Scenario | Averaging Period | Criteria | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Turkish[1] | EU[2] | IFC[3] * |
| | Yearly | 1st Maximum | 0.06 | 547804.31; 4539145.59 | 40 | 40 | 20 |
| Scenario - 9.a | 24 Hourly | 1st Maximum | 0.19 | 511481.89; 4528565.01 | 50 | 50 | 50 |
| | | 35th Maximum | 0.09 | 527884.44; 4532444.03 | | | |
| | | Number of Exceedance | 0 | - | 35 times | 35 times | - |
| | Yearly | 1st Maximum | 0.04 | 527884.44; 4532444.03 | 40 | 40 | 20 |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)
[2] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air
[3] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)
* The IFC limit value for yearly $PM_{10}$ is taken as 40 µg/m³ in line with Turkish and EU standards.

## $PM_{2.5}$ Emission Modelling Results

The highest modelling results for $PM_{2.5}$ and the coordinates where the highest 24-hourly and yearly concentrations were calculated are presented in Table 189 for all the scenarios. The PM2.5 modelling results presented in this section show the ground level concentrations expected to be caused from the Project related activities. The total ground level concentrations, which includes the baseline measurement results, are assessed under “Cumulative Assessment of Modelling Results on Sensitive Receptors” sub-heading.

It can be seen that all the $PM_{2.5}$ modelling results for all scenarios are way below the regulatory limit values and the IFC standards. The maximum modelled 24-hourly and yearly $PM_{2.5}$ concentrations are calculated as 0.23 µg/m³ and 0.06 µg/m³ respectively.

**Table 189: Modelling Results for $PM_{2.5}$ Parameter**

| Scenario | Averaging Period | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | |
|---|---|---|---|---|---|
| | | | | IFC | EU |
| Scenario -7.a | 24 Hourly | 0.23 | 576265.77; 4547304.28 | 25 | - |
| | Yearly | 0.02 | 592073.81; 4550528.25 | 10 | 20 |
| Scenario -8.a | 24 Hourly | 0.21 | 547804.31; 4539145.59 | 25 | - |
| | Yearly | 0.06 | 547804.31; 4539145.59 | 10 | 20 |

| Scenario | Averaging Period | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | |
|---|---|---|---|---|---|
| | | | | IFC | EU |
| Scenario -9.a | 24 Hourly | 0.19 | 511481.89; 4528565.01 | 25 | - |
| | Yearly | 0.04 | 527884.44; 4532444.03 | 10 | 20 |

## CO Emission Modelling Results

The highest modelling results for CO and the coordinates where the highest 8-hourly concentrations were calculated are presented in Table 190 for all the scenarios.

It can be seen that all the CO modelling results for all scenarios are way below the regulatory limit values and the IFC standards. The maximum modelled 8-hourly CO concentrations are calculated as 0.0012 µg/m³.

**Table 190: Modelling Results for CO Parameter**

| Scenario | Averaging Period | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | |
|---|---|---|---|---|---|
| | | | | Turkish | EU |
| Scenario -7.b | 8 Hourly | 0.00143 | 576265.77; 4547304.28 | 10 | 10 |
| Scenario -8.b | 8 Hourly | 0.00007 | 547804.31; 4539145.59 | 10 | 10 |
| Scenario -9.b | 8 Hourly | 0.0012 | 511481.89; 4528565.01 | 10 | 10 |

## VOC Emission Modelling Results

The highest modelling results for VOC and the coordinates where the highest hourly and short-term value (STV) concentrations were calculated are presented in Table 191 for all the scenarios.

It can be seen that all the VOC modelling results for all scenarios are way below the regulatory limit values and the IFC standards. The maximum modelled hourly and STV VOC concentrations are calculated as 0.23 µg/m³ and 0.06 µg/m³ respectively.

**Table 191: Modelling Results for VOC Parameter**

| Scenario | Averaging Period | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) |
|---|---|---|---|---|
| | | | | Turkish |
| Scenario -7.c | Hourly | 0.23 | 576265.77; 4547304.28 | 280 |
| | STV (Short term value) | 0.02 | 592073.81; 4550528.25 | 70 |

| Scenario | Averaging Period | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) |
|---|---|---|---|---|
| | | | | Turkish |
| Scenario -8.c | Hourly | 0.21 | 547804.31; 4539145.59 | 280 |
| | STV | 0.06 | 547804.31; 4539145.59 | 70 |
| Scenario -9.c | Hourly | 0.19 | 511481.89; 4528565.01 | 280 |
| | STV | 0.04 | 527884.44; 4532444.03 | 70 |

## $NO_2$ Parameter Modelling Results

The 1st and 18th highest modelling results for $NO_2$ and the coordinates where the highest hourly and yearly concentrations were estimated are presented in Table 192 for all the scenarios.

For hourly results it is seen that the maximum $NO_2$ concentrations for all the scenarios are below the limit value as well as the IFC standard of 200 µg/m³. The maximum modelled hourly and yearly $NO_2$ concentrations are calculated as 145.29 µg/m³ and 4.55 µg/m³ respectively.

**Table 192: Modelling Results for $NO_2$ Parameter**

| Scenario | Averaging Period | Criteria | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Turkish [1] | EU[2] | IFC[3] * |
| Scenario -7.d | 24 Hourly | 1st Maximum | 125.32 | 576296.83; 4546793.26 | 200 | 200 | 200 |
| | | 18th Maximum | 102.25 | 576265.77; 4547304.28 | | | |
| | | Number of Exceedance | 0 | - | 18 times | 18 times | - |
| | Yearly | 1st Maximum | 1.58 | 592073.81; 4550528.25 | 40 | 40 | 40 |
| Scenario -8.d | 24 Hourly | 1st Maximum | 132.67 | 561385.52; 4545554.85 | 200 | 200 | 200 |
| | | 18th Maximum | 74.17 | 547804.31; 4539145.59 | | | |
| | | Number of Exceedance | 0 | - | 18 times | 18 times | - |
| | Yearly | 1st Maximum | 4.55 | 547804.31; 4539145.59 | 40 | 40 | 40 |

| Scenario | Averaging Period | Criteria | Result (µg/m³) | Coordinates (X; Y) | Limit Values (µg/m³) | | |
|---|---|---|---|---|---|---|---|
| | | | | | Turkish [1] | EU[2] | IFC[3] * |
| Scenario - 9.d | 24 Hourly | 1st Maximum | 145.29 | 525205.54; 4531128.80 | 200 | 200 | 200 |
| | | 18th Maximum | 78.88 | 511481.89; 4528565.01 | | | |
| | | Number of Exceedance | 0 | - | 18 times | 18 times | - |
| | Yearly | 1st Maximum | 2.83 | 527884.44; 4532444.03 | 40 | 40 | 40 |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)
[2] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air
[3] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)
* The IFC limit value for yearly $PM_{10}$ is taken as 40 µg/m³ in line with Turkish and EU standards.

### *Cumulative Assessment of Modelling Results on Sensitive Receptors*

The yearly and 24-hourly model results for the PM10, PM2.5 and Settled Dust parameters are given in Table 193 and for NO2 parameter in Table 194 for the 66 discrete receptors defined in the model.

In Table 195, the model results for ground level concentrations of $PM_{10}$, $PM_{2.5}$ and settled dust and in Table 196 NO2 are provided together with the background air quality concentrations and cumulative values that has been observed by adding up the model results with the background concentrations. The estimated ambient air quality values have been compared with the relevant regulatory limit values and IFC standards.

When the cumulative results are examined, it is seen that all the cumulative results are below both the regulatory limit and IFC standard.

The dispersion maps are presented in the Appendix F.

**Table 193: $PM_{10}$, $PM_{2.5}$ and Settled Dust Modelling Results at Sensitive Receptors**

| Receptor | $PM_{10}$ (µg/m³) | | $PM_{2.5}$ (µg/m³) | | Settled Dust (mg/m²/day) | |
|---|---|---|---|---|---|---|
| | 24-Hourly PM10 | Yearly PM10 | 24-Hourly PM2.5 | Yearly PM2.5 | 24-Hourly Settled Dust | Yearly Settled Dust |
| AQ - 1 | 0.030 | 0.003 | 0.030 | 0.003 | 0.000 | 0.000 |
| AQ - 2 | 0.036 | 0.005 | 0.036 | 0.005 | 0.000 | 0.001 |
| AQ - 3 | 0.006 | 0.002 | 0.006 | 0.002 | 0.000 | 0.000 |
| AQ - 4 | 0.023 | 0.002 | 0.023 | 0.002 | 0.000 | 0.000 |

| Receptor | $PM_{10}$ (µg/m$^3$) | | $PM_{2.5}$ (µg/m$^3$) | | Settled Dust (mg/m$^2$/day) | |
|---|---|---|---|---|---|---|
| | 24-Hourly PM10 | Yearly PM10 | 24-Hourly PM2.5 | Yearly PM2.5 | 24-Hourly Settled Dust | Yearly Settled Dust |
| AQ - 5 | 0.061 | 0.008 | 0.061 | 0.008 | 0.010 | 0.001 |
| AQ - 6 | 0.052 | 0.011 | 0.052 | 0.011 | 0.010 | 0.002 |
| AQ - 7 | 0.063 | 0.010 | 0.063 | 0.010 | 0.010 | 0.001 |
| AQ - 8 | 0.042 | 0.005 | 0.042 | 0.005 | 0.000 | 0.001 |
| AQ - 9 | 0.086 | 0.024 | 0.086 | 0.024 | 0.010 | 0.005 |
| AQ - 10 | 0.041 | 0.007 | 0.041 | 0.007 | 0.000 | 0.001 |
| AQ - 11 | 0.190 | 0.035 | 0.190 | 0.035 | 0.030 | 0.008 |
| AQ - 12 | 0.029 | 0.005 | 0.029 | 0.005 | 0.000 | 0.001 |
| AQ - 13 | 0.086 | 0.016 | 0.086 | 0.016 | 0.010 | 0.003 |
| AQ - 14 | 0.040 | 0.007 | 0.040 | 0.007 | 0.000 | 0.001 |
| AQ - 15 | 0.133 | 0.029 | 0.133 | 0.029 | 0.020 | 0.006 |
| AQ - 16 | 0.055 | 0.005 | 0.055 | 0.005 | 0.010 | 0.001 |
| AQ - 17 | 0.005 | 0.001 | 0.005 | 0.001 | 0.000 | 0.000 |
| AQ - 18 | 0.010 | 0.001 | 0.010 | 0.001 | 0.000 | 0.000 |
| AQ - 19 | 0.003 | 0.003 | 0.003 | 0.003 | 0.000 | 0.001 |
| AQ - 20 | 0.031 | 0.004 | 0.031 | 0.004 | 0.000 | 0.000 |
| AQ - 21 | 0.013 | 0.002 | 0.013 | 0.002 | 0.000 | 0.000 |
| AQ - 22 | 0.047 | 0.017 | 0.047 | 0.017 | 0.010 | 0.003 |
| AQ - 23 | 0.023 | 0.006 | 0.023 | 0.006 | 0.000 | 0.001 |
| AQ - 24 | 0.033 | 0.011 | 0.033 | 0.011 | 0.000 | 0.002 |
| AQ - 25 | 0.041 | 0.013 | 0.041 | 0.013 | 0.000 | 0.002 |
| AQ - 26 | 0.100 | 0.044 | 0.100 | 0.044 | 0.020 | 0.012 |
| AQ - 27 | 0.050 | 0.005 | 0.050 | 0.005 | 0.010 | 0.001 |
| AQ - 28 | 0.046 | 0.007 | 0.046 | 0.007 | 0.010 | 0.002 |
| AQ - 29 | 0.055 | 0.017 | 0.055 | 0.017 | 0.010 | 0.003 |

| Receptor | $PM_{10}$ (µg/m$^3$) | | $PM_{2.5}$ (µg/m$^3$) | | Settled Dust (mg/m$^2$/day) | |
|---|---|---|---|---|---|---|
| | 24-Hourly PM10 | Yearly PM10 | 24-Hourly PM2.5 | Yearly PM2.5 | 24-Hourly Settled Dust | Yearly Settled Dust |
| AQ - 30 | 0.010 | 0.001 | 0.010 | 0.001 | 0.000 | 0.000 |
| AQ - 31 | 0.022 | 0.003 | 0.022 | 0.003 | 0.000 | 0.001 |
| AQ - 32 | 0.404 | 0.138 | 0.404 | 0.138 | 0.060 | 0.031 |
| AQ - 33 | 0.040 | 0.007 | 0.040 | 0.007 | 0.010 | 0.002 |
| AQ - 34 | 0.134 | 0.031 | 0.134 | 0.031 | 0.050 | 0.013 |
| AQ - 35 | 0.011 | 0.001 | 0.011 | 0.001 | 0.000 | 0.000 |
| AQ - 36 | 0.077 | 0.022 | 0.077 | 0.022 | 0.010 | 0.003 |
| AQ - 37 | 0.046 | 0.011 | 0.046 | 0.011 | 0.000 | 0.001 |
| AQ - 38 | 0.038 | 0.013 | 0.038 | 0.013 | 0.000 | 0.002 |
| AQ - 39 | 0.045 | 0.003 | 0.045 | 0.003 | 0.000 | 0.001 |
| AQ - 40 | 0.029 | 0.009 | 0.029 | 0.009 | 0.000 | 0.002 |
| AQ - 41 | 0.019 | 0.006 | 0.019 | 0.006 | 0.000 | 0.001 |
| AQ - 42 | 0.031 | 0.002 | 0.031 | 0.002 | 0.000 | 0.000 |
| AQ - 43 | 0.025 | 0.002 | 0.025 | 0.002 | 0.000 | 0.000 |
| AQ - 44 | 0.219 | 0.024 | 0.219 | 0.024 | 0.040 | 0.007 |
| AQ - 45 | 0.006 | 0.001 | 0.006 | 0.001 | 0.000 | 0.001 |
| AQ - 46 | 0.012 | 0.002 | 0.012 | 0.002 | 0.000 | 0.001 |
| AQ - 47 | 0.022 | 0.003 | 0.022 | 0.003 | 0.000 | 0.001 |
| AQ - 48 | 0.011 | 0.001 | 0.011 | 0.001 | 0.000 | 0.000 |
| AQ - 49 | 0.010 | 0.001 | 0.010 | 0.001 | 0.000 | 0.000 |
| AQ - 50 | 0.010 | 0.001 | 0.010 | 0.001 | 0.000 | 0.000 |
| AQ - 51 | 0.022 | 0.003 | 0.022 | 0.003 | 0.010 | 0.001 |
| AQ - 52 | 0.033 | 0.003 | 0.033 | 0.003 | 0.010 | 0.001 |
| AQ - 53 | 0.012 | 0.002 | 0.012 | 0.002 | 0.000 | 0.001 |
| AQ - 54 | 0.006 | 0.001 | 0.006 | 0.001 | 0.000 | 0.000 |

| Receptor | $PM_{10}$ (µg/m³) | | $PM_{2.5}$ (µg/m³) | | Settled Dust (mg/m²/day) | |
|---|---|---|---|---|---|---|
| | 24-Hourly PM10 | Yearly PM10 | 24-Hourly PM2.5 | Yearly PM2.5 | 24-Hourly Settled Dust | Yearly Settled Dust |
| AQ - 55 | 0.008 | 0.002 | 0.008 | 0.002 | 0.000 | 0.001 |
| AQ - 56 | 0.064 | 0.008 | 0.064 | 0.008 | 0.010 | 0.002 |
| AQ - 57 | 0.028 | 0.004 | 0.028 | 0.004 | 0.000 | 0.001 |
| AQ - 58 | 0.037 | 0.005 | 0.037 | 0.005 | 0.000 | 0.001 |
| AQ - 59 | 0.053 | 0.006 | 0.053 | 0.006 | 0.030 | 0.004 |
| AQ - 60 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.000 |
| AQ - 61 | 0.004 | 0.000 | 0.004 | 0.000 | 0.000 | 0.000 |
| AQ - 62 | 0.028 | 0.006 | 0.028 | 0.006 | 0.000 | 0.002 |
| AQ - 63 | 0.053 | 0.009 | 0.053 | 0.009 | 0.010 | 0.004 |
| AQ - 64 | 0.029 | 0.004 | 0.029 | 0.004 | 0.000 | 0.002 |
| AQ - 65 | 0.028 | 0.003 | 0.028 | 0.003 | 0.000 | 0.000 |
| AQ - 66 | 0.010 | 0.001 | 0.010 | 0.001 | 0.000 | 0.000 |
| Highest Concentration | AQ-32-0.404 | AQ-32-0.138 | AQ-32-0.404 | AQ-32-0.138 | AQ-32-0.060 | AQ-32-0.031 |
| Turkish[1] | 50 | 40 | - | - | 390 | 210 |
| IFC[2] | 50 | 20 | 25 | 10 | - | - |
| EU[3] | 50 | 40 | - | 20 | - | - |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)

[2] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)

[3] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air

**Table 194: $NO_2$ Modelling Results at Sensitive Receptors**

| Receptor | $NO_2$ |
|---|---|
| | Yearly $NO_2$ (µg/m3) |
| AQ - 1 | 0.292 |
| AQ - 2 | 0.464 |

| Receptor | $NO_2$ |
|---|---|
| | Yearly $NO_2$ (µg/m3) |
| AQ - 3 | 0.107 |
| AQ - 4 | 0.214 |
| AQ - 5 | 0.705 |
| AQ - 6 | 0.907 |
| AQ - 7 | 0.828 |
| AQ - 8 | 0.461 |
| AQ - 9 | 1.804 |
| AQ - 10 | 0.621 |
| AQ - 11 | 2.524 |
| AQ - 12 | 0.462 |
| AQ - 13 | 1.313 |
| AQ - 14 | 0.601 |
| AQ - 15 | 2.064 |
| AQ - 16 | 0.381 |
| AQ - 17 | 0.045 |
| AQ - 18 | 0.135 |
| AQ - 19 | 0.278 |
| AQ - 20 | 0.331 |
| AQ - 21 | 0.161 |
| AQ - 22 | 1.192 |
| AQ - 23 | 0.469 |
| AQ - 24 | 0.881 |
| AQ - 25 | 0.997 |
| AQ - 26 | 2.792 |
| AQ - 27 | 0.391 |

| Receptor | $NO_2$ |
|---|---|
| | Yearly $NO_2$ (µg/m3) |
| AQ - 28 | 0.488 |
| AQ - 29 | 1.340 |
| AQ - 30 | 0.079 |
| AQ - 31 | 0.217 |
| AQ - 32 | 9.029 |
| AQ - 33 | 0.597 |
| AQ - 34 | 2.068 |
| AQ - 35 | 0.124 |
| AQ - 36 | 1.763 |
| AQ - 37 | 0.897 |
| AQ - 38 | 0.984 |
| AQ - 39 | 0.240 |
| AQ - 40 | 0.626 |
| AQ - 41 | 0.526 |
| AQ - 42 | 0.217 |
| AQ - 43 | 0.237 |
| AQ - 44 | 1.540 |
| AQ - 45 | 0.078 |
| AQ - 46 | 0.163 |
| AQ - 47 | 0.235 |
| AQ - 48 | 0.108 |
| AQ - 49 | 0.098 |
| AQ - 50 | 0.061 |
| AQ - 51 | 0.237 |
| AQ - 52 | 0.199 |

| Receptor | $NO_2$ |
|---|---|
| | Yearly $NO_2$ (µg/m3) |
| AQ - 53 | 0.165 |
| AQ - 54 | 0.075 |
| AQ - 55 | 0.140 |
| AQ - 56 | 0.624 |
| AQ - 57 | 0.291 |
| AQ - 58 | 0.354 |
| AQ - 59 | 0.381 |
| AQ - 60 | 0.007 |
| AQ - 61 | 0.014 |
| AQ - 62 | 0.432 |
| AQ - 63 | 0.645 |
| AQ - 64 | 0.308 |
| AQ - 65 | 0.281 |
| AQ - 66 | 0.043 |
| Highest Concentration | AQ-32 - 9.029 |
| Turkish[1] | 40 |
| IFC[2] | 40 |
| EU[3] | 40 |

[1] Regulation on Control of Industrial Air Pollution (Dated 03.07.2009 and Numbered 27277) and Regulation on Assessment and Management of Air Quality (Dated 06.06.2008 and Numbered 26898)

[2] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization) (Dated 30 April 2007)

[3] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air

**Table 195: Cumulative Assessment of Air Quality for $PM_{10}$, $PM_{2.5}$ and Settled Dust (Total Ground Level Concentrations)**

| Receptor | $PM_{10}$ (µg/m³) | | | $PM_{2.5}$ (µg/m³) | | | Settled Dust (mg/m²/day) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Short Term | | | Long term | | |
| | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* |
| AQ - 1 | 17.10 | 0.03 | **17.13** | 9.40 | 0.03 | **9.43** | 98.42 | 0.00 | **98.42** | 94.99 | 0.00 | **94.99** |
| AQ - 2 | 25.60 | 0.04 | **25.64** | 10.50 | 0.04 | **10.54** | 111.89 | 0.00 | **111.89** | 104.20 | 0.00 | **104.20** |
| AQ - 3 | 25.80 | 0.01 | **25.81** | 10.20 | 0.01 | **10.21** | 100.61 | 0.00 | **100.61** | 93.83 | 0.00 | **93.83** |
| AQ - 4 | 21.50 | 0.02 | **21.52** | 12.30 | 0.02 | **12.32** | 87.69 | 0.00 | **87.69** | 82.36 | 0.00 | **82.36** |
| AQ - 5 | 20.70 | 0.06 | **20.76** | 6.90 | 0.06 | **6.96** | 101.71 | 0.01 | **101.72** | 94.27 | 0.00 | **94.27** |
| AQ - 6 | 21.30 | 0.05 | **21.35** | 4.20 | 0.05 | **4.25** | 110.25 | 0.01 | **110.26** | 102.22 | 0.00 | **102.22** |
| AQ - 7 | 25.40 | 0.06 | **25.46** | 10.40 | 0.06 | **10.46** | 77.70 | 0.01 | **77.71** | 70.85 | 0.00 | **70.85** |
| AQ - 8 | 19.90 | 0.04 | **19.94** | 5.90 | 0.04 | **5.94** | 93.10 | 0.00 | **93.10** | 83.72 | 0.00 | **83.72** |
| AQ - 9 | 16.60 | 0.09 | **16.69** | 9.70 | 0.09 | **9.79** | 67.28 | 0.01 | **67.29** | 61.29 | 0.01 | **61.30** |
| AQ - 10 | 22.30 | 0.04 | **22.34** | 8.30 | 0.04 | **8.34** | 93.79 | 0.00 | **93.79** | 86.19 | 0.00 | **86.19** |
| AQ - 11 | 16.70 | 0.19 | **16.89** | 9.40 | 0.19 | **9.59** | 83.71 | 0.03 | **83.74** | 79.28 | 0.01 | **79.29** |
| AQ - 12 | 16.80 | 0.03 | **16.83** | 8.80 | 0.03 | **8.83** | 95.98 | 0.00 | **95.98** | 87.44 | 0.00 | **87.44** |
| AQ - 13 | 22.10 | 0.09 | **22.19** | 9.10 | 0.09 | **9.19** | 87.34 | 0.01 | **87.35** | 80.31 | 0.00 | **80.31** |
| AQ - 14 | 22.00 | 0.04 | **22.04** | 9.10 | 0.04 | **9.14** | 92.31 | 0.00 | **92.31** | 84.88 | 0.00 | **84.88** |
| AQ - 15 | 21.70 | 0.13 | **21.83** | 10.10 | 0.13 | **10.23** | 67.94 | 0.02 | **67.96** | 63.89 | 0.01 | **63.90** |
| AQ - 16 | 25.10 | 0.05 | **25.15** | 9.50 | 0.05 | **9.55** | 101.67 | 0.01 | **101.68** | 92.78 | 0.00 | **92.78** |
| AQ - 17 | 21.60 | 0.01 | **21.61** | 11.90 | 0.01 | **11.91** | 78.76 | 0.00 | **78.76** | 73.66 | 0.00 | **73.66** |
| AQ - 18 | 16.10 | 0.01 | **16.11** | 9.70 | 0.01 | **9.71** | 93.81 | 0.00 | **93.81** | 87.08 | 0.00 | **87.08** |
| AQ - 19 | 21.80 | 0.00 | **21.80** | 9.40 | 0.00 | **9.40** | 79.69 | 0.00 | **79.69** | 73.93 | 0.00 | **73.93** |
| AQ - 20 | 24.00 | 0.03 | **24.03** | 10.50 | 0.03 | **10.53** | 69.72 | 0.00 | **69.72** | 64.96 | 0.00 | **64.96** |
| AQ - 21 | 23.40 | 0.01 | **23.41** | 10.20 | 0.01 | **10.21** | 72.28 | 0.00 | **72.28** | 67.64 | 0.00 | **67.64** |
| AQ - 22 | 23.20 | 0.05 | **23.25** | 10.80 | 0.05 | **10.85** | 79.22 | 0.01 | **79.23** | 74.54 | 0.00 | **74.54** |
| AQ - 23 | 17.40 | 0.02 | **17.42** | 11.20 | 0.02 | **11.22** | 64.03 | 0.00 | **64.03** | 59.92 | 0.00 | **59.92** |
| AQ - 24 | 16.60 | 0.03 | **16.63** | 12.30 | 0.03 | **12.33** | 60.08 | 0.00 | **60.08** | 56.66 | 0.00 | **56.66** |
| AQ - 25 | 21.80 | 0.04 | **21.84** | 10.30 | 0.04 | **10.34** | 69.97 | 0.00 | **69.97** | 65.48 | 0.00 | **65.48** |
| AQ - 26 | 23.10 | 0.10 | **23.20** | 8.90 | 0.10 | **9.00** | 83.27 | 0.02 | **83.29** | 77.92 | 0.01 | **77.93** |

| Receptor | $PM_{10}$ (µg/m³) | | | $PM_{2.5}$ (µg/m³) | | | Settled Dust (mg/m²/day) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Short Term | | | Long term | | |
| | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* |
| AQ - 27 | 24.30 | 0.05 | **24.35** | 10.50 | 0.05 | **10.55** | 72.49 | 0.01 | **72.50** | 68.99 | 0.00 | **68.99** |
| AQ - 28 | 24.10 | 0.05 | **24.15** | 8.10 | 0.05 | **8.15** | 78.71 | 0.01 | **78.72** | 74.07 | 0.00 | **74.07** |
| AQ - 29 | 23.00 | 0.06 | **23.06** | 7.40 | 0.06 | **7.46** | 83.68 | 0.01 | **83.69** | 79.40 | 0.00 | **79.40** |
| AQ - 30 | 25.40 | 0.01 | **25.41** | 9.90 | 0.01 | **9.91** | 73.96 | 0.00 | **73.96** | 69.79 | 0.00 | **69.79** |
| AQ - 31 | 22.60 | 0.02 | **22.62** | 9.70 | 0.02 | **9.72** | 86.78 | 0.00 | **86.78** | 81.99 | 0.00 | **81.99** |
| AQ - 32 | 16.60 | 0.40 | **17.00** | 11.20 | 0.40 | **11.60** | 75.59 | 0.06 | **75.65** | 70.46 | 0.03 | **70.49** |
| AQ - 33 | 24.30 | 0.04 | **24.34** | 8.60 | 0.04 | **8.64** | 67.57 | 0.01 | **67.58** | 63.62 | 0.00 | **63.62** |
| AQ - 34 | 24.90 | 0.13 | **25.03** | 10.30 | 0.13 | **10.43** | 80.89 | 0.05 | **80.94** | 76.23 | 0.01 | **76.24** |
| AQ - 35 | 24.00 | 0.01 | **24.01** | 12.50 | 0.01 | **12.51** | 88.18 | 0.00 | **88.18** | 82.92 | 0.00 | **82.92** |
| AQ - 36 | 22.30 | 0.08 | **22.38** | 13.30 | 0.08 | **13.38** | 80.07 | 0.01 | **80.08** | 74.82 | 0.00 | **74.82** |
| AQ - 37 | 15.80 | 0.05 | **15.85** | 12.00 | 0.05 | **12.05** | 70.43 | 0.00 | **70.43** | 65.50 | 0.00 | **65.50** |
| AQ - 38 | 25.30 | 0.04 | **25.34** | 11.40 | 0.04 | **11.44** | 75.70 | 0.00 | **75.70** | 72.02 | 0.00 | **72.02** |
| AQ - 39 | 25.60 | 0.05 | **25.65** | 9.20 | 0.05 | **9.25** | 79.04 | 0.00 | **79.04** | 75.47 | 0.00 | **75.47** |
| AQ - 40 | 21.80 | 0.03 | **21.83** | 11.10 | 0.03 | **11.13** | 84.86 | 0.00 | **84.86** | 80.37 | 0.00 | **80.37** |
| AQ - 41 | 16.80 | 0.02 | **16.82** | 9.40 | 0.02 | **9.42** | 88.65 | 0.00 | **88.65** | 82.83 | 0.00 | **82.83** |
| AQ - 42 | 22.40 | 0.03 | **22.43** | 10.80 | 0.03 | **10.83** | 76.84 | 0.00 | **76.84** | 70.43 | 0.00 | **70.43** |
| AQ - 43 | 24.00 | 0.02 | **24.02** | 11.60 | 0.02 | **11.62** | 93.25 | 0.00 | **93.25** | 84.70 | 0.00 | **84.70** |
| AQ - 44 | 24.40 | 0.22 | **24.62** | 12.40 | 0.22 | **12.62** | 83.18 | 0.04 | **83.22** | 75.78 | 0.01 | **75.79** |
| AQ - 45 | 24.90 | 0.01 | **24.91** | 11.80 | 0.01 | **11.81** | 89.73 | 0.00 | **89.73** | 82.47 | 0.00 | **82.47** |
| AQ - 46 | 23.10 | 0.01 | **23.11** | 9.70 | 0.01 | **9.71** | 85.68 | 0.00 | **85.68** | 81.14 | 0.00 | **81.14** |
| AQ - 47 | 20.30 | 0.02 | **20.32** | 12.90 | 0.02 | **12.92** | 94.32 | 0.00 | **94.32** | 88.21 | 0.00 | **88.21** |
| AQ - 48 | 14.80 | 0.01 | **14.81** | 11.00 | 0.01 | **11.01** | 73.37 | 0.00 | **73.37** | 69.00 | 0.00 | **69.00** |
| AQ - 49 | 23.80 | 0.01 | **23.81** | 10.40 | 0.01 | **10.41** | 85.78 | 0.00 | **85.78** | 80.26 | 0.00 | **80.26** |
| AQ - 50 | 23.30 | 0.01 | **23.31** | 10.60 | 0.01 | **10.61** | 82.02 | 0.00 | **82.02** | 77.17 | 0.00 | **77.17** |
| AQ - 51 | 23.50 | 0.02 | **23.52** | 7.50 | 0.02 | **7.52** | 88.61 | 0.01 | **88.62** | 84.07 | 0.00 | **84.07** |
| AQ - 52 | 19.50 | 0.03 | **19.53** | 8.50 | 0.03 | **8.53** | 81.74 | 0.01 | **81.75** | 77.22 | 0.00 | **77.22** |
| AQ - 53 | 18.90 | 0.01 | **18.91** | 9.30 | 0.01 | **9.31** | 96.09 | 0.00 | **96.09** | 90.37 | 0.00 | **90.37** |
| AQ - 54 | 15.10 | 0.01 | **15.11** | 7.90 | 0.01 | **7.91** | 86.47 | 0.00 | **86.47** | 80.81 | 0.00 | **80.81** |

| Receptor | $PM_{10}$ (µg/m³) | | | $PM_{2.5}$ (µg/m³) | | | Settled Dust (mg/m²/day) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | Short Term | | | Long term | | |
| | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* | BC* | MR* | CR* |
| AQ - 55 | 20.00 | 0.01 | **20.01** | 7.80 | 0.01 | **7.81** | 68.99 | 0.00 | **68.99** | 64.17 | 0.00 | **64.17** |
| AQ - 56 | 19.90 | 0.06 | **19.96** | 9.00 | 0.06 | **9.06** | 77.07 | 0.01 | **77.08** | 72.73 | 0.00 | **72.73** |
| AQ - 57 | 15.10 | 0.03 | **15.13** | 10.00 | 0.03 | **10.03** | 74.34 | 0.00 | **74.34** | 69.96 | 0.00 | **69.96** |
| AQ - 58 | 22.10 | 0.04 | **22.14** | 9.00 | 0.04 | **9.04** | 72.86 | 0.00 | **72.86** | 67.59 | 0.00 | **67.59** |
| AQ - 59 | 21.00 | 0.05 | **21.05** | 8.50 | 0.05 | **8.55** | 60.08 | 0.03 | **60.11** | 56.66 | 0.00 | **56.66** |
| AQ - 60 | 13.50 | 0.00 | **13.50** | 9.00 | 0.00 | **9.00** | 77.77 | 0.00 | **77.77** | 72.77 | 0.00 | **72.77** |
| AQ - 61 | 15.30 | 0.00 | **15.30** | 8.30 | 0.00 | **8.30** | 71.43 | 0.00 | **71.43** | 66.58 | 0.00 | **66.58** |
| AQ - 62 | 23.50 | 0.03 | **23.53** | 7.30 | 0.03 | **7.33** | 83.64 | 0.00 | **83.64** | 78.83 | 0.00 | **78.83** |
| AQ - 63 | 19.40 | 0.05 | **19.45** | 7.60 | 0.05 | **7.65** | 92.69 | 0.01 | **92.70** | 88.19 | 0.00 | **88.19** |
| AQ - 64 | 21.30 | 0.03 | **21.33** | 6.20 | 0.03 | **6.23** | 102.26 | 0.00 | **102.26** | 94.02 | 0.00 | **94.02** |
| AQ - 65 | 14.40 | 0.03 | **14.43** | 7.50 | 0.03 | **7.53** | 82.51 | 0.00 | **82.51** | 77.21 | 0.00 | **77.21** |
| AQ - 66 | 20.40 | 0.01 | **20.41** | 10.30 | 0.01 | **10.31** | 92.31 | 0.00 | **92.31** | 84.88 | 0.00 | **84.88** |
| Highest CR Value | AQ-333-25.81 | | | AQ-36-13.38 | | | AQ-2-111.89 | | | AQ-2-104.22 | | |
| Turkish | 50 | | | - | | | 210 | | | 390 | | |
| IFC | 50 | | | 25 | | | - | | | - | | |
| EU | 50 | | | - | | | - | | | - | | |

*BC: Background Concentration, MR: Modelling Result, CR: Cumulative Result

**Table 196: Cumulative Assessment of Air Quality for $NO_2$ (Total Ground Level Concentrations)**

| Receptor | $NO_2$ (µg/m³) | | |
|---|---|---|---|
| | BC* | MR* | CR* |
| AQ - 1 | 10.57 | 0.29 | 10.86 |
| AQ - 2 | 11.89 | 0.46 | 12.35 |
| AQ - 3 | 11.65 | 0.11 | 11.76 |
| AQ - 4 | 13.13 | 0.21 | 13.34 |
| AQ - 5 | 13.61 | 0.71 | 14.32 |
| AQ - 6 | 13.87 | 0.91 | 14.78 |
| AQ - 7 | 13.16 | 0.83 | 13.99 |
| AQ - 8 | 12.80 | 0.46 | 13.26 |
| AQ - 9 | 12.15 | 1.80 | 13.95 |
| AQ - 10 | 12.86 | 0.62 | 13.48 |
| AQ - 11 | 13.35 | 2.52 | 15.87 |
| AQ - 12 | 13.12 | 0.46 | 13.58 |
| AQ - 13 | 13.41 | 1.31 | 14.72 |
| AQ - 14 | 14.52 | 0.60 | 15.12 |
| AQ - 15 | 14.67 | 2.06 | 16.73 |
| AQ - 16 | 14.80 | 0.38 | 15.18 |
| AQ - 17 | 14.89 | 0.05 | 14.94 |
| AQ - 18 | 13.90 | 0.13 | 14.03 |
| AQ - 19 | 14.01 | 0.28 | 14.29 |
| AQ - 20 | 13.67 | 0.33 | 14.00 |
| AQ - 21 | 10.76 | 0.16 | 10.92 |
| AQ - 22 | 11.50 | 1.19 | 12.69 |
| AQ - 23 | 11.35 | 0.47 | 11.82 |
| AQ - 24 | 12.53 | 0.88 | 13.41 |
| AQ - 25 | 12.20 | 1.00 | 13.20 |
| AQ - 26 | 11.61 | 2.79 | 14.40 |

| Receptor | $NO_2$ (µg/m³) | | |
|---|---|---|---|
| | BC* | MR* | CR* |
| AQ - 27 | 11.57 | 0.39 | 11.96 |
| AQ - 28 | 12.41 | 0.49 | 12.90 |
| AQ - 29 | 13.11 | 1.34 | 14.45 |
| AQ - 30 | 12.86 | 0.08 | 12.94 |
| AQ - 31 | 12.63 | 0.22 | 12.85 |
| AQ - 32 | 11.86 | 9.03 | 20.89 |
| AQ - 33 | 12.52 | 0.60 | 13.12 |
| AQ - 34 | 12.22 | 2.07 | 14.29 |
| AQ - 35 | 12.84 | 0.12 | 12.96 |
| AQ - 36 | 13.59 | 1.76 | 15.35 |
| AQ - 37 | 14.15 | 0.90 | 15.05 |
| AQ - 38 | 14.46 | 0.98 | 15.44 |
| AQ - 39 | 14.85 | 0.24 | 15.09 |
| AQ - 40 | 15.14 | 0.63 | 15.77 |
| AQ - 41 | 14.81 | 0.53 | 15.34 |
| AQ - 42 | 13.32 | 0.22 | 13.54 |
| AQ - 43 | 13.95 | 0.24 | 14.19 |
| AQ - 44 | 12.41 | 1.54 | 13.95 |
| AQ - 45 | 11.20 | 0.08 | 11.28 |
| AQ - 46 | 9.87 | 0.16 | 10.03 |
| AQ - 47 | 10.96 | 0.23 | 11.19 |
| AQ - 48 | 10.08 | 0.11 | 10.19 |
| AQ - 49 | 10.19 | 0.10 | 10.29 |
| AQ - 50 | 11.00 | 0.06 | 11.06 |
| AQ - 51 | 10.21 | 0.24 | 10.45 |
| AQ - 52 | 11.35 | 0.20 | 11.55 |
| AQ - 53 | 11.57 | 0.17 | 11.74 |

| Receptor | $NO_2$ (µg/m³) | | |
|---|---|---|---|
| | BC* | MR* | CR* |
| AQ - 54 | 10.76 | 0.07 | 10.83 |
| AQ - 55 | 11.87 | 0.14 | 12.01 |
| AQ - 56 | 11.32 | 0.62 | 11.94 |
| AQ - 57 | 10.96 | 0.29 | 11.25 |
| AQ - 58 | 9.98 | 0.35 | 10.33 |
| AQ - 59 | 9.06 | 0.38 | 9.44 |
| AQ - 60 | 9.73 | 0.01 | 9.74 |
| AQ - 61 | 10.71 | 0.01 | 10.72 |
| AQ - 62 | 9.40 | 0.43 | 9.83 |
| AQ - 63 | 10.00 | 0.64 | 10.64 |
| AQ - 64 | 11.30 | 0.31 | 11.61 |
| AQ - 65 | 11.36 | 0.28 | 11.64 |
| AQ - 66 | 12.28 | 0.04 | 12.32 |
| Highest Concentration | AQ-32-20.89 | | |
| Turkish | 40 | | |
| IFC | 40 | | |
| EU | 40 | | |

*BC: Background Concentration, MR: Modelling Result, CR: Cumulative Result

#### 7.1.6.7.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction phases during the decommissioning and closure phase of the Project.

### *7.1.6.8 Mitigation Measures*

Air Quality and Greenhouse Gas Management Plan will be developed for the Project.

The following actions are recommended to reduce the dust generation in the construction areas:

- use of water suppression at construction sites, borrow pits and quarries and transportation routes, especially in hot-dry seasons,
- loads in all trucks transporting dust-generating materials will be sprayed with water to suppress dust,

- use of water suppression for control of loose materials on paved or unpaved road surfaces,
- use of dust suppression techniques, such as covers, water suppression, or increased moisture content for open materials storage piles,
- use of closed haulage systems,
- loading and unloading of material will be carried out without scattering to the extent possible,
- keeping materials moist,
- speed reduction for the means travelling inside the construction site;
- In case alternative roads are present, construction traffic will avoid passing through the settlements. If unavoidable, necessary measures (i.e. speed limits) will be taken to prevent/minimise transportation related emissions and inform the communities about the activities and schedule.
- During the days of extreme wind conditions, construction and material extraction works will be suspended temporarily and/or production amounts will be reduced (e.g. amount of material extracted at the quarries/borrow sites) at locations close to sensitive receptors.
- Monthly monitoring campaign will be conducted during the construction phase at baseline locations close to the active construction sites and active operation of associated facilities and the results should be compared with the Air Pollution Regulation and IFC General EHS Guidelines – Air Emission and Air Quality and additional mitigation measures will be taken when necessary.

In order to reduce the air emissions from construction vehicles, the following actions shall be implemented. Relevant mitigation measures should be rigorously enforced in the vicinity of sensitive receptors (i.e. residential areas, ecologically sensitive areas).

- activities will be conducted trying to use the minimum required number of means at the same time,
- vehicle engines and other machinery shall be kept turned on only if necessary, avoiding any unnecessary emission,
- all equipment and machinery must be maintained for compliance with standards and technical regulations for the protection of the environment and have appropriate certification,
- machinery and equipment shall be periodically checked and maintained to ensure their good working condition.
- Monthly monitoring campaign will be conducted during the construction phase at baseline locations

### *7.1.6.9 Residual Impacts*

#### 7.1.6.9.1 Construction Phase

The residual impact on the air quality component after the implementation of the above-mentioned mitigation measures during construction phase is presented in the following table. According to the impact assessment process results, negligible impacts on the existing air quality in the AoI is expected due to the construction activities of the Project.

**Table 197: Impact Assessment Matrix for Air Quality Component During Construction Phase After Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation Effectiveness | Residual Impact Value |
|---|---|---|---|---|---|---|---|
| Emission of Dust | Duration: | Short | Very high | Short-term | **Low** | Medium high | **Negligible** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Low | | | | | |
| Gaseous emissions | Duration: | Short | Very high | Short-term | **Low** | Medium | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.6.9.2 Operation Phase

A negligible impact on air quality is expected since gaseous emissions are expected from the vehicles on the road. Therefore, impacts of emission will be localised and will not cause long-term or widespread changes on the local air quality. The residual impact on the air quality component after the implementation of the above-mentioned mitigation measures during operation phase is presented in the following table.

**Table 198: Impact Assessment Matrix for Air Quality Component During Operation Phase After Operation Mitigation**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation Effectiveness | Residual Impact Value |
|---|---|---|---|---|---|---|---|
| Gaseous emissions | Duration: | Long | Very high | Short-term | **Low** | Medium high | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

#### 7.1.6.9.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction and operation phases in the decommissioning and closure phase of the Project.

### *7.1.6.10 Monitoring*

Monitoring campaign is recommended be conducted at the baseline measurement locations close to the active construction sites and active associated facilities in order to observe the dust emissions during the construction activities and the results will be compared with the Project Standards.

During pre-construction phase of the Project, an air quality monitoring programme for PM10 and PM2.5 parameters will be developed. These measurements will be carried out continuously for a minimum of 3 consecutive months to improve the baseline data and to account for seasonal variations. .

The monitoring activities should be conducted by an accredited laboratory.

Exhaust emissions from construction and transportation vehicles should be periodically monitored along with the requirements in the Regulation on Control of Exhaust Gas Emission both in construction and operation period of the Project.

### 7.1.7 Greenhouse Gas (GHG) Emissions

This section presents calculation and assessments of the greenhouse gas (GHG) emissions to be originated from the activities of the Project and Project's contribution to climate change.

The GHG emissions estimation methods used in this assessment generally follow internationally accepted practices for conducting Environmental Assessments. Where applicable, the Greenhouse Gas Protocol/A Corporate Accounting and Reporting Standard prepared by the World Business Council for Sustainable Development/World Resources (April 2004; hereafter referred to as the GHG Protocol) is applied. The GHG Protocol provides guidance for preparing corporate GHG inventories, as well as sector-specific and general calculation tools that can be used for estimating GHG emissions. The GHG protocol has been adopted by the Global Reporting Initiative. The GHG Protocol introduces the concept of direct and indirect emissions and scopes for GHG emission inventory under three broad categories, as follows:

**Scope 1 – Direct GHG emissions:**

Carbon emissions occurring from sources that are owned or controlled by the Project (e.g., emissions from combustion in owned or controlled boilers, furnaces and vehicles, process and fugitive emissions).

**Scope 2 – Indirect GHG emissions:**

Carbon emissions from the generation of purchased electricity, heat or steam consumed by the Project.

**Scope 3 – Other indirect GHG emissions:**

Carbon emissions which are a consequence of a company's activities but occur from sources not financially or operationally controlled by the company (e.g., emissions from waste, the extraction and production of purchased materials; and employee travel to and from work).

The GHG Protocol requires reporting of Scope 1 (direct emissions from site) and Scope 2 (emissions from on-site energy consumption) emissions only. Scope 1 and Scope 2 emissions are typically the focus of most corporate inventories, although many organizations choose to account for other activities such as employee travel and downstream emissions from waste. These sources are classified as Scope 3 (indirect) emissions and are reported optionally. Given the nature of Project operations, Scope 1 emissions will be the most significant. Accordingly, Scope 1 have been the primary focus of the GHG inventory. Additionally, Scope 2 emissions have been estimated considering the electricity consumption expected during Project life. On the other hand, due to the nature and current state of the Project, Scope 3 emissions are only considered for the usage of the Project services (i.e. emissions resulting from the vehicles passing through the motorway) and remaining Scope 3 emissions (including emissions resulting from induced and diverted traffic) could not be calculated at this stage of the Project due to the lack of data.

#### *7.1.7.1 Legislative Framework*

Climate change is a global phenomenon, which is the result of anthropogenic activities, mainly energy use, industrial processes and land use changes. Due to its multidimensional nature, fighting climate change requires actions at

different scales, e.g., international, regional and local. This section summarizes the legislative framework regarding climate change accordingly.

#### 7.1.7.1.1 International Standards

The main international body dealing with climate change is the United Nations Framework Convention on Climate Change (UNFCCC), adopted in 1992 Rio Earth Summit and ratified by 195 countries. UNFCCC guides countries on cooperation to fight climate change and to cope with its impacts. Currently, Ratification of Doha amendment to the Kyoto Protocol, covering 2013 – 2020 is under the focus of Türkiye, while the Paris Agreement is ratified by Türkiye and the Law on the Approval of the Paris Agreement by the Turkish Grand National Assembly entered into force after being published in the Official Gazette dated October 7th, 2021, and numbered 31621.

According to the IFC PS3, the client will consider alternatives and implement technically and financially feasible and cost-effective options to reduce project related GHG emissions during the design and operation of the Project. These options may include, but are not limited to, alternative project locations, adoption of renewable or low carbon energy sources, sustainable agricultural, forestry and livestock management practices, the reduction of fugitive emissions and the reduction of gas flaring.

For projects that are expected to or currently produce more than 25,000 tonnes of $CO_2$-equivalent annually,[184] the client will quantify direct emissions from the facilities owned or controlled within the physical project boundary,[185] as well as indirect emissions associated with the off-site production of energy[186] used by the project. Quantification of GHG emissions will be conducted by the client annually in accordance with internationally recognized methodologies and good practice.[187]

According to the EP2, GHG emissions should be calculated in line with the GHG Protocol[188] to allow for aggregation and comparability across Projects, organizations and jurisdictions. Clients may use national reporting methodologies if they are consistent with the GHG Protocol. The client will quantify Scope 1 and Scope 2 Emissions.

The EPFI will require the client to report publicly on an annual basis on GHG emission levels (combined Scope 1 and Scope 2 Emissions) and GHG efficiency ratio, as appropriate, during the operational phase for Projects emitting over 100,000 tonnes of $CO_2$ equivalent annually. Clients will be encouraged to report publicly on Projects emitting over 25,000 tonnes. Public reporting requirements can be satisfied via host country regulatory requirements for reporting or environmental impact assessments, or voluntary reporting mechanisms such as the Carbon Disclosure Project, where such reporting includes emissions at Project level.

#### 7.1.7.1.2 European Directives

The EU is a global leader in the fight against climate change. Since 1990 the EU has been enacting laws on GHG emissions, renewable energies and energy efficiency. An EU-wide climate policy framework has been established,

[184] The quantification of emissions should consider all significant sources of greenhouse gas emissions, including non-energy related sources such as methane and nitrous oxide, among others.

[185] Project-induced changes in soil carbon content or above ground biomass, and project-induced decay of organic matter may contribute to direct emissions sources and shall be included in this emissions quantification where such emissions are expected to be significant.

[186] Refers to the off-site generation by others of electricity, and heating and cooling energy used in the project.

[187] Estimation methodologies are provided by the Intergovernmental Panel on Climate Change, various international organizations, and relevant host country agencies.

[188] The GHG Protocol is based on a comprehensive globally standardised framework to measure and manage GHG emissions from operations. Available from ghgprotocol.org.

applied, and reviewed over decades. Therefore, EU legislation on climate change and GHG emissions are considered in the Project.

#### 7.1.7.1.3 Turkish Legislation

Türkiye's climate policy is shaped by Climate Change Adaptation Strategy and Action Plan (2024 – 2030) and Climate Change Mitigation Strategy and Action Plan (2024 – 2030). Also 12th National Development Plan (2024 – 2028) emphasizes reduction of GHG emissions and strengthening climate change adaptation actions. It also emphasizes sustainable management of natural resources with low carbon growth and green economy.

The table below lists Turkish legislation related to climate change and GHG emissions.

**Table 199: Turkish Legislation on Climate Change and GHG Emissions**

| Date | Number | Title |
|---|---|---|
| 28.12.2003 | 25330 | Regulation on Availability of Customer Information regarding Fuel Economy and $CO_2$ Emissions of New Automobiles |
| 09.10.2013 | 28790 | Notice on Voluntary Carbon Market Project Registration |
| 17.05.2014 | 29003 | Regulation on Monitoring of Greenhouse Gas Emissions |
| 22.07.2014 | 29068 | Notice on Monitoring and Reporting Greenhouse Gas Emissions |
| 02.12.2017 | 30258 | Notice on Validation of Greenhouse Gas Reports and Accreditation of Validator Institutions |
| 29.06.2022 | 31881 | Regulation on Fluorinated Greenhouse Gases |

Regulation on Monitoring of Greenhouse Gas Emissions aims to define the procedures and principles on monitoring, calculating, verifying and reporting the greenhouse gases emissions. Annex 1 of the Regulation includes the Projects that subject to this Regulation, and which should monitor, report and verify the GHG emissions in the GHG mechanism established by MoEUCC.

Since motorway projects are not one of the listed Projects specified in Annex 1, the Project is not subject to this Regulation.

### *7.1.7.2 GHG Emission Calculation Methodology*

The following sections summarize the emission calculation methods, input parameters and assumptions that are used to estimate the annual GHG emissions of the Project.

The GHG considered in the assessment include Carbon dioxide ($CO_2$), Methane ($CH_4$), and Nitrous Oxide ($N_2O$). There are no Project activities which are expected to emit Sulphur hexafluoride ($SF_6$), Perfluorocarbons (PFCs) or Hydrofluorocarbons (HFCs), therefore, these compounds are not included in the GHG assessment.

The Project is anticipated to include sources that produce GHGs during construction, operation and closure phases. It is assumed that more GHG sources will be present during the construction phase than the closure phase. Therefore, the assessment for construction phase is used as a representative estimation for the closure phase since the activities at the closure phase yet to be clear right now.

The emissions estimation methods used to quantify annual GHGs follow internationally accepted practices for conducting EIAs and, where applicable, the Regulation on Monitoring Greenhouse Gas Emissions.

GHGs have the potential to affect future climate as they contribute to the greenhouse effect by absorbing longwave radiation, emitted by the Earth, in the atmosphere, increasing temperature and changing weather patterns. There is a potential for the Project activities to release GHG emissions that could contribute incrementally to climate change.

GHG emissions are expressed as tonnes of equivalent $CO_2$, calculated by multiplying the annual emissions of each indicator compound by its 100-year global warming potential (GWP). A single measure is used when evaluating effects, namely the maximum annual GHG emissions resulting from the Project activities in tonnes of carbon dioxide equivalent ($CO_2e$). The maximum annual GHG emissions from the Project activities will put in context of the annual GHGs at both a national and global level.

The GHG Protocol provided by the World Business Council for Sustainable Development/World Resources Institute (WBCSD/WRI, 2004) outlines guidance for preparing corporate GHG emission inventories and introduces the concept of direct and indirect emissions and scopes for the inventory. Given the nature of the Project operations, the most significant emissions will be Scope 1, which are direct GHG emissions occurring from Stationary Sources (e.g., emissions from generators), Mobile Sources that are owned or controlled by the Owner (e.g., emissions from combustion in vehicles, and fugitive emissions) and blasting activities.

GHG emissions are assessed based on Project schedules and information provided by Client regarding to amounts of fuel and explosive use, number of equipment/vehicles and other potential GHG sources. Scientifically accepted and well documented emission factors from the Türkiye's National Inventory Report (NIR) released in 2023 under UNFCCC[189] are used. Where local guidance is not available then emission factors from the Intergovernmental Panel on Climate Change (IPCC), are also used. A discussion of the global warming potentials is provided by Section 7.1.7.2.1 below. Table 200 provides a summary of the activities for which GHG emissions are calculated.

**Table 200:GHG Emission Sources of the Project**

| Phase | Source | GHG Emissions |
|---|---|---|
| Construction | Concrete Plants, Precast Plants, Asphalt Plants and Mechanical Plants – Combustion of Diesel Oil | Emissions from Concrete Plants, Precast Plants, Asphalt Plants and Mechanical Plants |
| | Generators - Combustion of Diesel Oil | Emissions from the generators |
| | Vehicles - Combustion of Diesel Oil | On-site vehicle emissions, due to diesel combustion |
| | Blasting – Combustion of Fuel in Explosives | Emissions due to use of explosives for blasting activities |
| | Loss of Carbon Sink | Reduction of carbon sink due to loss of vegetation |
| | Electricity Consumption | Indirect emissions due to used electricity |
| Operation | Electricity Consumption | Indirect emissions due to used electricity |
| | Generators - Combustion of Diesel Oil | Emissions from the generators |

[189] Türkiye National Inventory Report (NIR) for UNFCCC, 2023, https://unfccc.int/documents/627786

| Phase | Source | GHG Emissions |
|---|---|---|
| | Vehicles - Combustion of Diesel Oil | On-site vehicle emissions, due to diesel combustion |
| | Usage of the Project Services | Emissions resulting from the vehicles passing through the motorway |

#### 7.1.7.2.1 Global Warming Potential

The GHG emissions are expressed as tonnes of $CO_2e$ by multiplying the annual emissions of each GHG by its 100-GWP. The GWP of each gas represents the ability of the gas to trap heat in the atmosphere in comparison to $CO_2$. Emissions of $CO_2$, $CH_4$ and $N_2O$ are converted to equivalent $CO_2$ ($CO_2e$) in the assessment of the GHG emissions.

The GWPs are taken from the United Nations Framework Convention on Climate Change reporting guidelines for the preparation of GHG inventory reports (UNFCCC, 2014), which represents the values used to prepare the national and global emissions inventories referenced in the main report. Table 201 provides the GWPs used in the GHG calculations.

**Table 201: Global Warming Potentials from the Intergovernmental Panel on Climate Change**

| GHG Compound | GWP |
|---|---|
| $CO_2$ | 1 |
| $CH_4$ | 25 |
| $N_2O$ | 298 |

#### 7.1.7.2.2 Scope 1: Direct GHG Emissions

The GHG Protocol provided by the World Business Council for Sustainable Development/World Resources Institute (WBCSD/WRI, 2004) outlines guidance for preparing corporate GHG emission inventories and introduces the concept of direct and indirect emissions and scopes for the inventory. Scope 1 accounts for direct GHG emissions from sources that are owned or controlled by the Project Owner.

##### *7.1.7.2.2.1 Stationary Combustion*

Stationary combustion sources for the Project include concrete plants, precast plants, asphalt plants, mechanical plants and diesel generators. GHG emissions from Project is determined based on the fuel consumption as provided by Client.

The emission factors on an energy basis are obtained from the IPCC 2006 Guidelines (Volume 2), Chapter 2 – Stationary Combustion Table 2.2 and Table 2.3. These emission factors are presented in Table 202 below.

**Table 202: Stationary Combustion - Energy-based Emission Factors and Net Calorific Value**

| Phase | Source | Net Calorific Value (TJ/Gg) | Reference | Emission Factor (kg GHG/TJ) | | | Reference | Fuel Density (kg/m³)* |
|---|---|---|---|---|---|---|---|---|
| | | | | $CO_2$ | $CH_4$ | $N_2O$ | | |
| Construction | Operation of the Plants - Combustion of Diesel Oil | 40.4 | Turkish Notification on Monitoring and Reporting of GHG Emissions (Official Gazette Date/Number: 22.07.2014/29068), Table 5.1 | 74,100 | 3.0 | 0.6 | IPCC 2006 guidelines, Chapter 2 – Stationary Combustion Table 2.3 | 832 |
| Construction and Operation | Use of Generators - Combustion of Diesel Oil | 40.4 | | 74,100 | 3.0 | 0.6 | IPCC 2006 guidelines, Chapter 2 – Stationary Combustion Table 2.2 | 832 |

* Density of diesel oil is specified as 820 - 845 kg/m³ (15 °C) in Safety Data Sheet of Turkish Petroleum Corporation. Average of the upper and lower limit values is calculated.

The equations for calculating the volume-based emission factors for $CO_2$, $CH_4$ and $N_2O$ are the same as those presented in following section.

#### *7.1.7.2.2.2 Mobile Fuel Consumption*

The GHG emissions from mobile equipment to be used during the construction and operation phases of the Project, are calculated based on fuel consumption and diesel-specific emission factors on an energy basis from the IPCC 2006 Guidelines (Volume 2), Chapter 3 – Mobile Combustion Table 3.3.1 and related 2019 Refinement. These emission factors are presented in Table 203 below.

**Table 203: Mobile Combustion - Energy-based Emission Factors and Net Calorific Value**

| Phase | Source | Net Calorific Value (TJ/Gg) | Reference | Emission Factor (kg GHG/TJ) | | | Reference | Fuel Density (kg/m³)* |
|---|---|---|---|---|---|---|---|---|
| | | | | $CO_2$ | $CH_4$ | $N_2O$ | | |
| Construction & Operation | Vehicles - Combustion of Diesel Oil | 40.4 | Turkish Notification on Monitoring and Reporting of GHG Emissions (Official Gazette Date/Number: 22.07.2014/29068), Table 5.1 | 74,100 | 4.15 | 28.6 | IPCC 2006 guidelines, Chapter 3 – Mobile Combustion Table 3.3.1 | 832 |

* Density of diesel oil is specified as 820 - 845 kg/m³ (15 °C) in Safety Data Sheet of Turkish Petroleum Corporation. Average of the upper and lower limit values is calculated.

A sample equation provided below presents the methods for calculating the volume-based emission factors (EF) for $CO_2$, $CH_4$ and $N_2O$:

$CO_2$ Emission Factor:

$$\mathrm{EF}_{\mathrm{CO_2}}\left(\frac{kg\ CO_2}{L}\right) = \text{Energy based EF}\left(\frac{\mathrm{t\ CO_2}}{\mathrm{TJ}}\right) \times \text{Net Calorific Value}\left(\frac{\mathrm{TJ}}{\mathrm{kT}}\right) \times \text{Density of Diesel}\left(\frac{\mathrm{kg}}{\mathrm{m^3}}\right) \times \frac{1{,}000\ \mathrm{kg\ CO_2}}{1\ \mathrm{t\ CO_2}} \times \frac{1\ \mathrm{kT}}{1{,}000{,}000\ \mathrm{kg}} \times \frac{1\ m^3}{1{,}000\ \mathrm{L}}$$

Total $CO_2$ Emissions from Mobile Equipment:

$$\mathrm{E_{CO_2}} = \text{Fuel Combustion}\left(\frac{\mathrm{L}}{\mathrm{yr}}\right) \times \text{Emission Factor}\left(\frac{\mathrm{kg\ CO_2}}{\mathrm{L}}\right) \times \frac{1\ \mathrm{tonne}}{1{,}000\ \mathrm{kg}}$$

#### *7.1.7.2.2.3 Blasting*

During the construction phase of the Project, significant amount explosives will be used for the blasting activities. The combustion of diesel fuels in the explosives will result in emissions of GHGs. In order to calculate the GHG emissions due to the blasting activities using explosives, the emission factors provided by Australian Greenhouse Office[190] for the explosive types are used (Table 204). For the calculation of the GHG emissions due to use of explosives, the following equation is used.

$$E_{CO_2} = \sum_i M_i * EF_i$$

Where;

$E_{CO2}$: Total $CO_2$ Emissions due to use of explosives (t $CO_2$),

$M_i$: Amount of explosives used (tonnes),

$EF_i$: Emission Factor of the explosives used (t $CO_2$/t explosive),

i: Explosive Type

**Table 204: Emission Factors for the Explosive Types**

| Explosive type | Tonne $CO_2$/tonne explosive |
|---|---|
| ANFO | 0.1673 |
| Emulsion | 0.1659 |

### 7.1.7.2.3 Scope 2: Indirect GHG Emissions

Scope 2 emissions are 'indirect' GHG emissions associated with the Project that are a consequence of the activities of the company but occur at sources owned or controlled by another company.

Scope 2 accounts indirect GHG emissions from the generation of purchased electricity, heat or steam consumed by the company.

[190] Australian Greenhouse Office (2006), AGO Factors & Methods Workbook, December 2006

#### 7.1.7.2.3.1 Electricity Consumption

The Scope 2-Indirect GHG emissions are expected to be from electricity consumption. For the emission factor of electricity consumption, Turkish National Electricity Grid Emission Factor (0.7279 t $CO_2$/MWh) calculated by the Turkish Ministry of Energy and Natural Resources is used. The equation for calculating the indirect GHG emissions due to the electricity purchased is given below.

$$E_{CO_2} = \sum_i E_i * EF$$

Where;

$E_{CO2}$: Total indirect $CO_2$ Emissions due to electricity consumption (t $CO_2$),

$E_i$: Use of electricity for each activity (MWh),

$EF_i$: National Electricity Grid Emission Factor (t $CO_2$/MWh),

i: Activity that consumes electricity.

### 7.1.7.2.4 Emissions Not Included in Scope 1 or Scope 2

#### 7.1.7.2.4.1 Carbon Stock Change

Land use change and loss of carbon sink are the reason for indirect $CO_2$ emission. Due to the construction activities, the natural lands such as croplands, forestlands and grasslands are disturbed and occupied till the Project life end time. These activities result in change in carbon stock. The following formulation, referring to IPCC 2006 Guidelines Volume 4 Chapter 2, is used to calculate change in biomass stocks.

$$\Delta C_{CONVERSION} = \sum_i \{(B_{AFTER_i} - B_{BEFORE_i}) * \Delta A_{TO_OTHERS}\} * CF$$

Where;

$\Delta C_{CONVERSION}$: initial change in biomass carbon stocks on land converted to another land category, tonnes C/year,

$B_{AFTERi}$: biomass stocks on land type i immediately after the conversion, tonnes d.m./ha,

$B_{BEFOREi}$: biomass stocks on land type i before the conversion, tonnes d.m./ha,

$\Delta A_{TO_OTHERSi}$: area of land use i converted to another land use category in a certain year, ha/year,

C: carbon fraction of dry matter, tonne C/(tonnes d.m.),

i: type of land use converted to another land use category.

**Table 205: Carbon Stock Change Values**

| Parameter | Values | | | Unit | Reference |
|---|---|---|---|---|---|
| | Forestland | Grassland | Cropland | | |
| Annual area of land converted to other land | 92.66 | 16.38 | 1,502.38 | ha | IPCC 2006 IPCC Guidelines for National Greenhouse Gas Inventories V4 Chapter 4 -Table 4.12, Chapter 5 - Table 5.9, Chapter 6 - Table 6.4. |
| Biomass stocks before the conversion | 100.0 | 13.5 | 2.1 | tonnes dm $ha^{-1}$ | |
| Biomass stocks after the conversion | 0 | 0 | 0 | tonnes dm $ha^{-1}$ | |
| Carbon fraction of dry matter | 0.5 | 0.5 | 0.5 | tonnes C (tonne dm)$^{-1}$ | |

### *7.1.7.3 Impact Analysis*

#### 7.1.7.3.1 Construction Phase

#### Stationary Combustion Emissions

During the construction phase of the Project, Stationary Combustion GHG emissions will be generated from:

- Combustion of diesel fuel due to the operation of Concrete Plants, Precast Plants, Asphalt Plants and Mechanical Plants, and
- Combustion of diesel fuel due to use of generators during construction works.

During the construction phase of the Project, 3 Concrete Plants, 2 Precast Plants, 2 Asphalt Plants and 2 Mechanical Plants will be operated. Also, generators will be used in case needed. Diesel fuel will be the main source for the operation of these plants and generators. The total estimated diesel consumption due to operation of these plants and use of generators during the construction period provided by the Client are converted to the annual consumption (9,330,000 liters/year). Then the total Stationary Combustion GHG Emissions were calculated using the equations given in Section 7.1.7.2.2.1. The yearly GHG emissions due to Stationary Combustion were calculated as 23,317.9 tonne $CO_2$/year (total of 87,442.1 tonne $CO_2$ for the construction phase).

#### Mobile Combustion Emissions

During the construction phase of the Project, GHG emissions will expected to occur due to mobile combustion during the use of on-road and off-road vehicles, machinery and equipment. The primary fuel that will be used for machinery, vehicles and equipment will be diesel. The total estimated diesel consumption due to use of mobile vehicles for all the construction activities provided by the Client are converted to the annual consumption (22,250,000 liters/year). Then the total GHG Emissions from Mobile Combustion were calculated using the

equations given in Section 7.1.7.2.2.2. The yearly GHG emissions due to Mobile Combustion were calculated as 61,869.9 tonne $CO_2$/year (total of 232,012.1 tonne $CO_2$ for the construction phase).

### Blasting

During the construction phase of the Project, explosives will be used for the blasting activities. The combustion of diesel fuels in the explosives will result in emissions of GHGs. According to the information provided by the Client, total of 5,986.0 tonnes of ANFO and 179.5 tonnes of Emulsion explosives will be used annually during the construction phase. Using the emission factors and the formula given in Section 7.1.7.2.2.3, the yearly GHG emission originated from the use of explosives during the construction phase was calculated as 343.7 tonnes $CO_2$/year (total of 1,288.9 tonne $CO_2$ for the construction phase).

### Carbon Stock Change

Indirect GHG emissions are expected to arise from carbon stock change due to land use change during the construction phase of the Project. Emissions resulting from land use change have been estimated by making assumptions regarding the current use of the land and the quantity of carbon estimated to be stored within it. Since land clearing does not affect below ground carbon stocks, only above ground carbon stock is taken into consideration. According to the information provided from CORINE 2018 data of the Project area, the land (1,611.42 ha) comprises 93.2% cropland, 5.8% forest land and 1.0% grassland. Total area was calculated by multiplying the motorway length by the construction servitude width (~100 m). Using the equation given in 7.1.7.2.4.1, the total indirect GHG emissions due to land use change is calculated as 6.321,1 tonne $CO_2$/year (total of 23,704.1 tonne $CO_2$ for the construction phase).

### Electricity Consumption

During the construction phase of the Project, GHG emissions will expected to occur due to electricity consumption. According to information provided by Client, total of 6,050 MWh electricity is expected to be used during the construction phase. Using the emission factors and the formula given in Section 7.1.7.2.3.1, the yearly GHG emission originated from the electricity consumption during the construction phase was calculated as 4,403.8 tonnes $CO_2$/year (total of 16,514.3 tonne $CO_2$ for the construction phase).

### Total GHG Emissions in Construction Phase

The annual GHG emissions for construction phase of the Project are presented in Table 206. These annual emissions are calculated for the maximum construction scenario described above. They are based on rough estimates and may significantly overestimate the actual emissions.

**Table 206: Annual Project GHG Emissions for Construction Phase**

| Source | Calculated GHG (as t $CO_2e$/y) | | | Total GHG amount | |
|---|---|---|---|---|---|
| | t $CO_2$/y | t $CH_4$/y | t $N_2O$/y | t $CO_2e$/year | Percentage (%) |
| Stationary Sources (Plants and Generators) - Combustion of Diesel Oil | 23,238.3 | 23.5 | 56.1 | 23,317.9 | 24.2 |
| Vehicles - Combustion of Diesel Oil | 55,418.3 | 77.5 | 6,374.1 | 61,869.9 | 64.3 |
| Blasting – Combustion of Fuel in Explosives | 343.7 | - | - | 343.7 | 0.4 |
| Loss of Carbon Sink | 6,321.1 | - | - | 6,321.1 | 6.6 |

| Source | Calculated GHG (as t $CO_2e/y$) | | | Total GHG amount | |
|---|---|---|---|---|---|
| | t $CO_2/y$ | t $CH_4/y$ | t $N_2O/y$ | t $CO_2e$/year | Percentage (%) |
| Electricity Consumption | 4,403.8 | - | - | 4,403.8 | 4.6 |
| TOTAL | | | | 96,256.4 | 100.00 |

The table above presents the annual emissions from the construction phase, with contribution of each source to the overall GHG emissions of the Project. Tonnes of $CO_2e$ are calculated using the GWPs from Section 7.1.7.2.1 above.

**Table 207: Comparison of Project GHG Emissions to National and Global Emissions**

| Source | Data |
|---|---|
| Project GHG Emissions (tonnes $CO_2e$/year) (during construction) | 96,256.4 |
| Comparison to Türkiye-wide Total (%) | 0.017% |
| Comparison to Global Total (%) | 0.0005% |
| **Türkiye-wide GHG Emissions (2020)[191] (tonnes $CO_2e$/year)** | 558,270,482 |
| **UNFCCC Annex-I 2020 GHG Emissions[192] (tonnes $CO_2e$/year)** | 19,207,285,454 |

Table 207 summarizes the annual overall emissions in tonnes of $CO_2e$ for the Project construction phase. Data for Türkiye's GHG releases are obtained from Türkiye's latest National Inventory Report (NIR for the year 2022) for UNFCCC and total of Annex-I countries GHG releases are obtained from UNFCCC GHG database for the last inventory year 2021. For the construction phase, regarding the GHG emissions, the Project's contribution to the total emissions reported for the country level and global reporting programs is not significant.

It is accepted that increased anthropogenic GHG emissions are contributing to climate change. However, the GHG emissions due to the Project represent unmeasurable increase in global GHG emissions. Country scale and GHG emission levels are anticipated to be maintained.

The combined annual emissions from the construction phase of the Project are about **96,256.4 t $CO_2e$ per annum (total of 360,951.5 t $CO_2e$ for the construction phase)**. This annual value surpasses the 25,000 t $CO_2e$ threshold defined in IFC PS3 and Equator Principles IV. Therefore, technically feasible and cost-effective mitigation options should be considered.

[191] Obtained from TURKSTAT, Türkiye NIR for the year 2022

[192] Obtained from UNFCCC GHG database, https://di.unfccc.int/time_series

#### 7.1.7.3.2 Operation Phase

### Stationary Combustion Emissions

During the operation phase of the Project, Stationary Combustion GHG emissions will be generated from combustion of diesel fuel due to use of generators at toll plazas, O&M Centres, and other operational facilities in cases of emergencies.

Diesel fuel will be the main source for the use of generators. The total estimated diesel consumption due to use of generators during the emergency cases provided by the Client are converted to the annual consumption (10,000 liters/year). Then the total Stationary Combustion GHG Emissions were calculated using the equations given in Section 7.1.7.2.2.1. The yearly GHG emissions due to Stationary Combustion were calculated as 25.0 tonne $CO_2$/year (total of 2,500 tonne $CO_2$ for the operation phase).

### Mobile Combustion Emissions

During the operation phase of the Project, GHG emissions will be expected to occur due to mobile combustion during the use of Project vehicles, machinery and equipment. The primary fuel that will be used for machinery, vehicles and equipment will be diesel. The total estimated diesel consumption due to use of mobile vehicles for all the operation activities provided by the Client are converted to the annual consumption (1,000,000 liters/year). Then the total GHG Emissions from Mobile Combustion were calculated using the equations given in Section 7.1.7.2.2.2. The yearly GHG emissions due to Mobile Combustion were calculated as 2,780.7 tonne $CO_2$/year (total of 278,070 tonne $CO_2$ for the operation phase).

### Electricity Consumption

During the operation phase of the Project, GHG emissions will expected to occur due to electricity consumption. According to information provided by Client, total of 22,000 MWh electricity is expected to be used during the operation phase. Using the emission factors and the formula given in Section 7.1.7.2.3.1, the yearly GHG emission originated from the electricity consumption during the operation phase was calculated as 16,013.8 tonnes $CO_2$/year (total of 1,601,380 tonne $CO_2$ for the operation phase).

### Total Scope 1 & 2 GHG Emissions in Operation Phase

The annual GHG emissions for operation phase of the Project in combination of Scope 1 & 2 emissions, are presented in Table 208. These annual Scope 1 & 2 emissions are calculated for the maximum operation scenario described above. They are based on rough estimates and may significantly overestimate the actual emissions.

**Table 208: Annual Project Scope 1 & 2 GHG Emissions for Operation Phase**

| Source | Calculated GHG (as t $CO_2e$/y) | | | Total GHG amount | |
|---|---|---|---|---|---|
| | t $CO_2$/y | t $CH_4$/y | t $N_2O$/y | t $CO_2e$/year | Percentage (%) |
| Stationary Sources (Generators) - Combustion of Diesel Oil | 24.8 | 0.1 | 0.1 | 25.0 | 0.1 |
| Vehicles - Combustion of Diesel Oil | 2,490.7 | 3.5 | 286.5 | 2,780.7 | 14.7 |
| Electricity Consumption | 16,013.8 | - | - | 16,013.8 | 85.2 |
| TOTAL | | | | 18,819.5 | 100.00 |

The table above presents the annual Scope 1 & 2 emissions from the operation phase, with contribution of each source to the overall GHG emissions of the Project. Tonnes of $CO_2e$ are calculated using the GWPs from Section 7.1.7.2.1 above.

**Table 209: Comparison of Project Scope 1 & 2 GHG Emissions to National and Global Emissions**

| Source | Data |
|---|---|
| Project Scope 1 & 2 GHG Emissions (tonnes $CO_2e$/year) (during operation) | 18,819.5 |
| Comparison to Türkiye-wide Total (%) | 0.003% |
| Comparison to Global Total (%) | 0.00009% |
| **Türkiye-wide GHG Emissions (2020)[193] (tonnes $CO_2e$/year)** | 558,270,482 |
| **UNFCCC Annex-I 2020 GHG Emissions[194] (tonnes $CO_2e$/year)** | 19,207,285,454 |

Table 209 summarizes the annual Scope 1 & 2 overall emissions in tonnes of $CO_2e$ for the Project operation phase. Data for Türkiye's GHG releases are obtained from Türkiye's latest National Inventory Report (NIR for the year 2022) for UNFCCC and total of Annex-I countries GHG releases are obtained from UNFCCC GHG database for the last inventory year 2021. For the operation phase, regarding the GHG emissions, the Project's contribution to the total emissions reported for the country level and global reporting programs is not significant.

It is accepted that increased anthropogenic GHG emissions are contributing to climate change. However, the Scope 1 & 2 GHG emissions due to the Project represent unmeasurable increase in global GHG emissions. Country scale and GHG emission levels are anticipated to be maintained.

The combined annual emissions from the operation phase of the Project for Scope 1 & 2 emissions are about **18,819.5 t $CO_2e$ per annum (total of 1,881,950 t $CO_2e$ for the operation phase)**. This annual value does not surpass the 25,000 t $CO_2e$ threshold defined in IFC PS3 and Equator Principles IV.

## Usage of the Project Services

During the operation phase of the Project, Scope 3 GHG emissions will be expected to occur due to usage of the Project Services (i.e. vehicles passing through the motorway).

According to the traffic load projections per year provided by the Client, the types and expected numbers of vehicles using the motorway per day were calculated and are presented below.

**Table 210: Types and Expected Numbers of Vehicles Using the Motorway on Daily Basis Over Years**

| Years | Vehicle Types (vehicle/day) | | | | | |
|---|---|---|---|---|---|---|
| | Car | Truck 2-axles | Truck 3-axles | Truck 4/5-axles | Truck 6+axles | Motorcycle |
| **2025** | 5,764 | 1,005 | 274 | 2,144 | 4,568 | 42 |

[193] Obtained from TURKSTAT, Türkiye NIR for the year 2022

[194] Obtained from UNFCCC GHG database, https://di.unfccc.int/time_series

| Years | Vehicle Types (vehicle/day) | | | | | |
|---|---|---|---|---|---|---|
| | Car | Truck 2-axles | Truck 3-axles | Truck 4/5-axles | Truck 6+axles | Motorcycle |
| **2026** | 7,903 | 1,061 | 242 | 1,904 | 4,056 | 51 |
| **2027** | 11,247 | 1,099 | 251 | 1,979 | 4,215 | 69 |
| **2028** | 12,395 | 1,280 | 291 | 2,291 | 4,880 | 75 |
| **2029** | 15,047 | 1,339 | 303 | 2,383 | 5,077 | 91 |
| **2030** | 16,323 | 1,398 | 314 | 2,476 | 5,273 | 98 |
| **2031** | 17,599 | 1,457 | 326 | 2,568 | 5,470 | 104 |
| **2032** | 18,874 | 1,516 | 338 | 2,660 | 5,667 | 111 |
| **2033** | 20,150 | 1,575 | 350 | 2,753 | 5,864 | 118 |
| **2034** | 21,425 | 1,634 | 361 | 2,845 | 6,060 | 125 |
| **2035** | 22,135 | 1,694 | 375 | 2,949 | 6,283 | 129 |
| **2036** | 22,861 | 1,756 | 388 | 3,057 | 6,513 | 134 |
| **2037** | 23,578 | 1,821 | 403 | 3,169 | 6,751 | 138 |
| **2038** | 24,311 | 1,887 | 417 | 3,285 | 6,998 | 142 |
| **2039** | 25,035 | 1,956 | 433 | 3,406 | 7,255 | 146 |
| **2040** | 25,770 | 2,028 | 449 | 3,530 | 7,521 | 151 |

In order to evaluate the worst-case scenario during the operation phase of the Project, traffic load projections for 2040 were taken into consideration for the Scope 3 GHG emission calculations. Based on that, it is assumed that 25,770 light motor vehicles, 2,028 medium heavy vehicles, 11,500 heavy vehicles and 151 powered two-wheelers will pass through the motorway in a day. Within this regard, Scope 3 GHG emissions were calculated with the following assumptions:

- Each vehicle travels the entire length of the motorway route.
- Amount of fuel use per 100 km for light motor vehicles, medium heavy vehicles, heavy vehicles and powered two-wheelers are assumed as 7.3 liter, 10.9 liter, 29.9 liter and 4.0 liter, respectively[195]. Based on that, amount of fuel used per trip for light motor vehicles, medium heavy vehicles, heavy vehicles and powered two-wheelers are determined as 7.7 liter/trip, 11.5 liter/trip, 31.5 liter/trip and 4.2 liter/trip, respectively.

[195] https://dergipark.org.tr/tr/download/article-file/1472050

Accordingly, the total Scope 3 GHG Emissions from vehicles passing through the motorway were calculated using the equations given in Section 7.1.7.2.2.2. The yearly GHG emissions due to vehicles passing through the motorway were calculated as 593,372.5 tonne $CO_2$/year (total of 59,337,250 tonne $CO_2$ for the operation phase).

#### 7.1.7.3.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction and operation phases in the decommissioning and closure phase of the Project.

### *7.1.7.4 Mitigation Measures*

The annual GHG emissions calculations for the construction and operation phases of the Project are presented in the sections above. These annual emissions are based on the approximate data and preliminary estimations provided by Client. Therefore, these calculations may be significantly underestimated or overestimated compared to the actual emissions. Considering these approximations, GHG emission calculations for construction and operation phases should be conducted again once the actual consumption amounts, and design parameters are known.

Section 7.1.7.2 describes methodology for estimation of GHG emissions originated from the Project and Section 7.1.7.3 evaluates potential contribution to global climate change. As stated above, the Project's contribution to national and global GHG emissions and climate change is not significant since both the annual and total emissions are not high compared to Turkish and Global GHG emissions. Since the annual GHG emissions for the construction phase of the Project are above the threshold value defined in IFC PS3 and Equator Principles IV, GHG emissions that arise from the Project will be quantified and reported publicly on an annual basis for the construction phase.

In addition, the following measures will be applied to reduce GHG emissions and increase resource efficiency as much as possible:

- The Best Available Techniques should be taken into consideration in Project design as much as possible. The applicability of the Best Available Techniques (BATs) developed within the European regulatory framework [i.e., Integrated Pollution Prevention and Control, "IPPC", BAT Reference Documents (BREFs) according to the European Directive 2010/75/EU (IED)] should be evaluated and integrated into the Project design.
- All employees will be provided climate, resource and energy efficiency awareness training.
- The most efficient equipment in terms of fuel usage and effective operation will be chosen. Maintenance of all machinery and equipment will be periodically conducted to ensure efficient fuel use and effective operation as well.
- Efficient resource and material use will be promoted through the development and implementation of a management plans to reduce direct and indirect GHG emissions due to the Project. Other aspects of resource efficiency regarding water usage are covered in Project Description and related impact assessment section.
- No idling and out-of-scope operation of the machinery and equipment will be allowed.
- Apart from the Project footprint, vegetation cover will not be disturbed.
- Project design will be reviewed in a way that will reduce the Project footprint as much as possible.
- Blasting patterns will be reviewed in a way that will reduce the amounts of explosives to be used.

- In order to reduce the GHG emissions resulting from waste disposal processes, amount of wastes generated as a result of project actions will be minimized and generated wastes will be recycled accordingly.
- During the closure phase, rehabilitation of land will help to recover lost carbon sink by converting the disturbed land to its original state as much as possible, which will act as a long-term mitigation measure.
- Green Energy Certificate which indicates that a certain amount or entire electricity used by the Project comes from renewable energy sources, should be obtained in order to induce a decrease in Scope 2 related GHG emissions which is linked to the construction and operation phases of the Project.
- Air Quality and Greenhouse Gas Management Plan will be developed for the Project. This Plan will also include the updated Scope 3 GHG emission calculations once the design parameters and consumption amounts are known.

### *7.1.7.5 Residual Impacts*

#### 7.1.7.5.1 Construction Phase

According to the GHG calculations for the construction phase presented in the sections above, the estimated contribution of the Project is assessed as low when compared to national and international GHG emission levels. The table below summarizes the identified impact factor involved in the construction phase of the Project.

**Table 211: GHG Emissions Impact Matrix for Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| GHG Emissions | Duration: | Medium | Medium | Long term | **High** | Medium high | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | International | | | | | |
| | Intensity: | Medium | | | | | |

#### 7.1.7.5.2 Operation Phase

According to the GHG calculations for the operation phase presented in the sections above, the estimated contribution of the Project is assessed as low when compared to national and international GHG emission levels. The table below summarizes the identified impact factor involved in the operation phase of the Project.

**Table 212: GHG Emissions Impact Matrix for Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| GHG Emissions | Duration: | Long | Medium | Long term | **High** | Medium high | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | International | | | | | |
| | Intensity: | Low | | | | | |

#### 7.1.7.5.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction and operation phases in the decommissioning and closure phase of the Project.

### *7.1.7.6 Monitoring*

The following table details the monitoring activities identified for reporting and verifying of GHG emissions of the Project during construction period.

For each monitoring activity and measure/action identified, the table shows:

- The reference (or source) documents (i.e., Turkish standard, permits, IFC Performance Standards and EHS Guidelines or other GIIP);
- Frequency/timing of the measurement,
- The Key Performance Indicator (KPI), and related quantitative target (if the target consists of a regulatory limit this will also be indicated); and,
- The related responsible party for implementing the related monitoring activity.

**Table 213: Resource Efficiency and Energy Management Monitoring Actions**

| Source Document | Monitoring Action/Measure Description | Frequency/Timing | KPI | Target/Acceptance Criteria | Responsible Parties |
|---|---|---|---|---|---|
| • GHG Protocol<br>• IPCC | • Quantify the resource consumption and specifications on a periodic (i.e. monthly) basis by appropriate methods; record and aggregate data on the consumption of the following resources:<br>1. Concrete Plants, Precast Plants, Asphalt Plants and Mechanical Plants – Diesel Oil (construction);<br>2. Generators - Diesel Oil (construction);<br>3. Vehicles - Diesel Oil (construction and operation);<br>4. Explosives (construction); and<br>5. Electricity (construction and operation).<br>• Location of flow meters and counters must be clearly identified on a Site layout. Records on the data resources (such as fuel invoices that include consumption amounts) must be kept. | Monthly | • Amounts consumed<br>1. [L]<br>2. [L]<br>3. [L]<br>4. [kg]<br>5. [MWh] | N.A. | Client / Contractors |
| • GHG Protocol<br>• IPCC | • Quantify the net calorific value and density of consumed resources and specifications on a periodic (i.e. monthly) basis by appropriate methods; record and aggregate data on consumption of the following resources: | Monthly | • The example units are provided below, other similar related units are acceptable. | N.A. | Client / Contractors |

| Source Document | Monitoring Action/Measure Description | Frequency/Timing | KPI | Target/Acceptance Criteria | Responsible Parties |
|---|---|---|---|---|---|
| | 1. Concrete Plants, Precast Plants, Asphalt Plants and Mechanical Plants – Diesel Oil (construction);<br>2. Generators - Diesel Oil (construction);<br>3. Vehicles - Diesel Oil (construction and operation);<br><br>Records on the data resources (such as fuel invoices that include consumption amounts) must be kept. | | • Net calorific value: TJ/Gg<br>• Density: kg/lt | | |
| • IFC PS3 | • GHG emission levels (combined Scope 1 and Scope 2 Emissions, and, if appropriate, the GHG efficiency ratio) from the facilities owned or controlled within the physical project boundary, as well as indirect emissions associated with the off-site production of energy used by the Project will be quantified and reported publicly on annual basis during the construction phase. | Annual | • GHG Emission Report | Compliance with international standards | Client / Contractors |
| • GIIP | • Number of employees that have completed the climate, resource and energy efficiency awareness trainings will be checked. | Semi-annually | • Training records | 100% | Client / Contractors |
| • GIIP | • Maintenance records of machinery and equipment will be checked for regular maintenance periods. | Monthly | • Maintenance records | 100% | Client / Contractors |

| Source Document | Monitoring Action/Measure Description | Frequency/Timing | KPI | Target/Acceptance Criteria | Responsible Parties |
|---|---|---|---|---|---|
| • GIIP | • Prior to any activity on site, final Project footprint will be determined. | Prior to any activity on site | • Project footprint | Decrease in land use/disruption | Client / Contractors |
| • GIIP | • Records on waste types and corresponding amounts will be recorded. | Monthly | • Waste records | Decrease in amount of waste generated and continuous improvement | Client / Contractors |
| • GIIP | • Number of non-compliances with GHG emissions management measures will be recorded | Continuously | • Visual<br>• Records<br>• Grievances | Minimization of non-compliances and continuous improvement | Client / Contractors |

### 7.1.8 Climate Change Risk Assessment

The "*Equator Principles 4 – Principle 2: Environmental and Social Assessment*" requires that a Climate Change Risk Assessment (CCRA) is required to be prepared:

- For all Category A and, as appropriate, Category B Projects and will include consideration of relevant physical risks as defined by the TCFD[196], and
- For all Projects, in all locations, when combined Scope 1 and Scope 2 Emissions are expected to be more than 100,000 tonnes of $CO_2$ equivalent annually. Consideration must be given to relevant Climate Transition Risks (as defined by the TCFD) and an alternatives analysis completed which evaluates lower Greenhouse Gas (GHG) intensive alternatives.

Therefore, a Climate Change Risk Assessment (CCRA) is being prepared within the scope of ESIA. Since the Project is proposed as "Category A" according to EP4, considering the current and anticipated climate risks of the Project's operations, the plans, processes, policies, and systems in place to manage these risks (i.e., to mitigate, transfer, accept or control), and Project's compatibility with the host Türkiye's national climate commitments, as appropriate.

The CCRA is presented in Appendix G.

### 7.1.9 Noise

The Project has the potential to generate noise during the construction and operation phases. This section aims to assess impacts of noise on the closest sensitive areas.

The noise impact evaluation is performed in the Project AoI which includes potentially affected settlements as defined in the baseline section. During the assessment of noise impacts originated from the Project's activities, baseline noise levels of the potentially affected settlements in the Project AoI have also been taken into consideration. The Project actions and impact factors defined in the Methodology Section of this ESIA Report are considered during impact assessment, and the mitigation and management measures are defined in this Section. As detailed below, the main approach for impact analysis is based on the calculations, modelling and predictions of noise impacts during all main phases of the Project. A noise modelling software "SoundPLAN Essential 5.0"[197] was applied to determine the predicted noise levels that would potentially occur during the construction and operation phases of the planned Project.

#### *7.1.9.1 Noise Baseline Summary*

In order to determine the baseline noise levels along the planned motorway route in consideration with the associated facilities, 66 representative background noise measurement locations mostly of the closest sensitive receptors to the Project components and/or activities, within the Project AoI have been determined. Between September 19th – October 1st, 2022, ambient noise levels were measured during a 48-hours period in these baseline locations in line with TS 9798 (ISO 1996–2) and TS 9315 (ISO 1996–1) standards. The noise measurement campaign was carried out by Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti.

[196] Task Force on Climate-related Financial Disclosures (TCFD)

[197] https://www.soundplan.eu/en/software/soundplanessential/

which is an accredited company by the Ministry of Environment, Urbanization and Climate Change for noise measurements.

The baseline noise measurement results are presented in the baseline section of this Report (see Section 6.1.9). The noise measurement results were compared with both IFC noise standards and Turkish Regulatory noise limit values. In this respect, it was observed that baseline noise levels are below the IFC noise standards as well as Turkish Regulatory noise limits, except for the locations N19 and N20 at where night-time noise levels measured exceeded the IFC night-time noise standards. For these locations where IFC noise standards have been exceeded, a 3 dBA increase in background noise levels due to the proposed Project is allowed by the IFC guidelines.

#### *7.1.9.2 Noise Modelling Methodology*

A noise modelling software "SoundPLAN Essential 5.0" was applied to determine the predicted noise level that would potentially occur during the construction and operation phases of the planned Project.

Different study areas for modelling studies were determined along the motorway route and around the associated facilities regarding the sensitive receptors (including the 59[198] locations where the baseline noise measurements were carried out) that will mostly be affected by both the construction and the operation of the Project.

During the modelling studies for each study area, below steps were followed:

7) As a first step of modelling studies, the elevation model that directly affects the noise distribution of the natural terrain was created. In the meantime, elevation contours with 10 m intervals on the topographic map were digitized and loaded into the program. Interpolation of elevation contours was performed in the program and natural elevation data of the motorway route and its surroundings to be used in the model were obtained. After the elevations were digitalized, Temporary DGM (Digitalized Ground Model) was generated.

8) At the second step, the humidity, temperature and air pressure data of the study area, where the planned motorway sections will pass through and associated facilities will present, were introduced to the model.

9) At the third step, the noise sources identified for the study area were introduced to the model together with their noise levels (dBA). The noise levels of vehicles and equipment, identified as noise sources during the Project phases, were obtained from the noise modelling software program's library.

10) At the fourth step, the determined receptors were digitized in the model.

11) At the fifth step, ground effects, which is another important parameter for the noise distribution, were also digitized in the model. Ground effects varies between 0 to 1, where 0 corresponds to hard, reflective surfaces and 1 corresponds to soft, absorptive surfaces.

12) Finally, the modelling process was initiated by determining a calculation area that include all the noise sources and sensitive receptors in the study area. For the worst-case scenario simulation, all the noise sources were assumed to work at the same time and at the distances identified before. As a result of the model runs, noise levels in the defined receptors and grid noise maps for each study area were obtained.

The Noise Model assumptions and approaches are listed below:

[198] N3, N17, N18, N22, N41, N54 and N60 baseline noise measurement locations were scoped out during the modelling studies due to the changes in the Project Layout.

- Noise model was developed by using equipment type and amount, and noise levels which is defined in the below sections;
- The humidity, temperature and air pressure for each of the study area were taken as follows, by assuming a general average for three regions:
  - For areas within Çorlu Region of Tekirdağ Province, the humidity was taken as 76%, temperature as 14°C and air pressure as 997 hPA which are defined in the “Meteorology and Climatology” section of this ESIA Report (Section 6.1.2);
  - For areas within Malkara Region of Tekirdağ Province, the humidity was taken as 71%, temperature as 14°C and air pressure as 992 hPA which are defined in the “Meteorology and Climatology” section of this ESIA Report (Section 6.1.2); and
  - For the rest of the areas within or around the Tekirdağ Province boundaries, the humidity was taken as 77%, temperature as 14°C and air pressure as 1014 hPA which are defined in the “Meteorology and Climatology” section of this ESIA Report (Section 6.1.2).
- The ground effects were taken according to the rurality & urbanity intensity of the study area which are different from each other, varying between 0.5 and 0.8; and
- The model is set considering the worst-case scenario, which represents the situation where all of the noise sources are operating at the same time with maximum capacity and maximum allowed speed.

For the worst-case scenario simulation, modelled noise levels were cumulatively assessed by considering the highest baseline noise levels measured and the cumulative noise values were compared with the Project standards.

#### *7.1.9.3 Impact Analysis*

##### 7.1.9.3.1 Construction Phase

Potential impacts of noise during the construction phase of the Project, will mainly originate from the operations of heavy equipment/machines that will be used in the infrastructure and superstructure construction as well as operation of the associated facilities.

During the construction phase, impacts will be mainly associated to the following **impact factors**:

- Emission of noise.

The **Project actions** related to the abovementioned impact factor are the following:

- Vegetation clearing,
- Surface levelling and grading (including dismantling of existing structures),
- Temporary stockpiling of material,
- Transportation of construction materials,
- Construction of the motorway and service facilities,
- Construction of the associated facilities, and
- Operation of associated facilities during construction.

In this section, the environmental noise generated by the machinery and equipment to be used in the infrastructure and superstructure construction as well as operation of the associated facilities, is evaluated cumulatively and conservatively for the purpose of displaying the worst-case scenario during the construction phase of the Project. It should be noted that no construction activity will take place during the night-time.

It should be noted that during the construction activities, road closures and resulting traffic diversions will be temporary, and increases in traffic volume or changes in traffic patterns are expected to be limited accordingly. Based on that, road closures might also temporarily reduce the noise levels resulting from the vehicle traffic, at the nearby settlements.

The list of equipment and machinery that will be used during the construction of the whole Project are provided by the Client and presented in Table 214. The noise levels of these equipment/machine were obtained from the library of Sound Plan Essential 5.0 and were introduced to the model. The given equipment/machine list represents all the equipment that will be used throughout the construction works which will be carried out simultaneously in different sections of the planned motorway route and other units such as quarries, borrow pits, storage areas, concrete batching plants, asphalt plants, mechanical plants and precast plants. Therefore, for model input, following assumptions have been made for the noise sources:

- Since the construction activities will be performed in fractionated areas of the motorway alignment and due to the technical constraints in SoundPlan Essential, limited segments of 250 m * 25 m of rectangular construction area for the construction of motorway have been identified for each study area. The cumulative Lw of construction machine and equipment that will be used in this rectangular construction area, is calculated as 137.9 dBA by applying the total calculation formula for the equipment defined in the Roadway Construction Noise Model User's Guide (RCNM) of the United States (US) Federal Highway Administration. As a result, for each modelling study area, a rectangular noise area source (250 m * 25 m) with a sound power level (Lw) of **137.9 dBA** have been used in the modelling studies.
- For the construction activities at the other project units (quarries, borrow pits, storage areas, concrete batching plants, asphalt plants, mechanical plants and precast plants), point sources with a sound level of **125 dBA** have been used in the modelling studies. In this respect, it should be noted that approximate locations of the associated facilities were provided by the Client.

In the context of the worst-case scenario approach, it has been accepted that the machines and equipment used in the construction activities are working simultaneously, in a collective way and at maximum sound power levels.

**Table 214: Construction Machine/Equipment List**

| Construction Equipment | Number of Equipment | Sound Power (Lw)* |
|---|---|---|
| Grader | 20 | 119 |
| Roller | 100 | 118 |
| Trucks | 622 | 123 |
| Loader | 42 | 116 |
| Excavator | 103 | 112 |
| JCB | 15 | 116 |

| Construction Equipment | Number of Equipment | Sound Power (Lw)* |
|---|---|---|
| Water Truck | 30 | 123 |
| Dozer | 29 | 117 |
| Truck Mounted Crane (Hi-up) | 46 | 105 |
| Mobile Crane | 19 | 105 |
| Portal Crane | 2 | 105 |
| Concrete Pump | 10 | 109 |
| Concrete Mixer | 45 | 108 |
| Fuel Truck | 13 | 123 |
| Boring Machine | 6 | 125 |
| Finisher | 22 | 110 |
| Asphalt Rollers | 30 | 118 |
| Rock Drilling Machine | 8 | 125 |
| Asphalt Distributor | 3 | 123 |
| Shuttle Buggy | 2 | 99 |
| Power Curber | 1 | 110 |
| **Total** | **1,168** | **-** |

*Noise levels of the machine/equipment are obtained from the library of Sound Plan Essential 5.0.

The determined 41 study areas (including both the motorway route and the associated facilities), where the baseline measurements at 59 locations were carried out, are modelled for the cumulative assessment of the construction phase. The calculated noise levels at the receptors, where baseline noise measurements were conducted, the cumulative results and the comparison of the results with the IFC standards and Turkish limit values are presented in Table 215. Detailed breakdown of the cumulative results of the assessed receptors are given below:

- Turkish day-time noise regulatory limit value is exceeded at 19 locations out of 63, which are N5, N9, N13, N14, N16, N19, N26, N27, N30, N33, N34, N39, N42, N44, N50, N51, N52, N56, N59;
- Turkish evening-time noise regulatory limit value is exceeded at 38 locations out of 63, which are N1, N2, N5, N7, N9, N10, N11, N13, N14, N16, N19, N26, N27, N29, N30, N31, N32, N33, N34, N36, N37, N38, N39, N40, N42, N44, N50, N51, N52, N56, N58, N59, N62, N63, N64, N65, N66 and AN4;
- IFC day-time noise standard is exceeded at 46 locations out of 63, which are N1, N4, N5, N6, N7, N8, N9, N11, N12, N15, N16, N19, N20, N26, N27, N28, N29, N30, N31, N32, N33, N34, N36, N37, N38, N39, N40, N42, N43, N44, N47, N48, N49, N50, N51, N52, N53, N56, N58, N59, N62, N63, N64, N65, AN3 and AN4.

The daytime grid noise maps obtained for the construction phase are presented in the Figure 238 below.

## Table 215: Modelled Construction Noise Levels and Baseline Noise Levels at the Receptors

| Measurement Point | Measurement Location | | | | | | Modelled Noise Level (originated from Project activities) (dBA) | | | | | Baseline Noise Levels (dBA)** | | | | | Modelled Noise Level + The Ambient Noise Level (dBA) | | | | | Difference between ambient and modelled sound levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | Province | District | Village / Neighbourhood | Receptor Type* | Nearest Project Component | Distance to Nearest Project Component (m) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N1 | Tekirdağ | Malkara | Ahievren | R | Motorway Route | 850 | 61.8 | - | 61.8 | 61.8 | - | 48.7 | 44.0 | 49.5 | 45.5 | 43.9 | 62.0 | 44.0 | 62.0 | 61.9 | 43.9 | 13.3 | 0.0 | 12.5 | 16.4 | 0.0 |
| N2 | Tekirdağ | Malkara | Ahievren | C | Motorway Route | 680 | 61.4 | - | 61.4 | 61.4 | - | 47.6 | 40.6 | 49.0 | 42.5 | 40.0 | 61.6 | 40.6 | 61.6 | 61.5 | 40.0 | 14.0 | 0.0 | 12.6 | 19.0 | 0.0 |
| N4 | Tekirdağ | Malkara | Hereke | R | Motorway Route | 1,560 | 58.1 | - | 58.1 | 58.1 | - | 49.3 | 41.3 | 50.4 | 43.6 | 40.1 | 58.6 | 41.3 | 58.8 | 58.3 | 40.1 | 9.3 | 0.0 | 8.4 | 14.7 | 0.0 |
| N5 | Tekirdağ | Malkara | Yenice | R | Motorway Route | 600 | 68.5 | - | 68.5 | 68.5 | - | 50.5 | 43.4 | 51.3 | 46.6 | 42.7 | 68.6 | 43.4 | 68.6 | 68.5 | 42.7 | 18.1 | 0.0 | 17.3 | 21.9 | 0.0 |
| N6 | Tekirdağ | Malkara | Dereköy | R | Borrow Pit | 400 | 57.8 | - | 57.8 | 57.8 | - | 47.5 | 40.9 | 48.8 | 41.2 | 41.1 | 58.2 | 40.9 | 58.3 | 57.9 | 41.1 | 10.7 | 0.0 | 9.5 | 16.7 | 0.0 |
| N7 | Tekirdağ | Süleymanpaşa | Kınıklar | R | Storage Area | 260 | 63.5 | - | 63.5 | 63.5 | - | 52.4 | 42.7 | 54.9 | 42.4 | 42.7 | 63.8 | 42.7 | 64.1 | 63.5 | 42.7 | 11.4 | 0.0 | 9.2 | 21.1 | 0.0 |
| N8 | Tekirdağ | Süleymanpaşa | Akçahalil | R | Borrow Pit | 240 | 59.4 | - | 59.4 | 59.4 | - | 47.3 | 39.0 | 48.7 | 42.6 | 38.7 | 59.7 | 39.0 | 59.8 | 59.5 | 38.7 | 12.4 | 0.0 | 11.1 | 16.9 | 0.0 |
| N9 | Tekirdağ | Süleymanpaşa | Akçahalil | R | Motorway Route | 520 | 69.7 | - | 69.7 | 69.7 | - | 47.4 | 39.7 | 49.1 | 41.8 | 39.5 | 69.7 | 39.7 | 69.7 | 69.7 | 39.5 | 22.3 | 0.0 | 20.6 | 27.9 | 0.0 |
| N10 | Tekirdağ | Süleymanpaşa | Otmanlı | C | Motorway Route | 980 | 62.6 | - | 62.6 | 62.6 | - | 51.1 | 44.5 | 52.2 | 46.0 | 41.7 | 62.9 | 44.5 | 63.0 | 62.7 | 41.7 | 11.8 | 0.0 | 10.8 | 16.7 | 0.0 |
| N11 | Tekirdağ | Süleymanpaşa | İnecik | R | Motorway Route | 165 | 62.6 | - | 62.6 | 62.6 | - | 48.8 | 43.9 | 49.9 | 45.4 | 43.9 | 62.8 | 43.9 | 62.8 | 62.7 | 43.9 | 14.0 | 0.0 | 12.9 | 17.3 | 0.0 |
| N12 | Tekirdağ | Süleymanpaşa | İnecik | R | Motorway Route | 1,250 | 59.4 | - | 59.4 | 59.4 | - | 51.4 | 42.2 | 54.4 | 41.4 | 42.2 | 60.0 | 42.2 | 60.6 | 59.5 | 42.2 | 8.6 | 0.0 | 6.2 | 18.1 | 0.0 |
| N13 | Tekirdağ | Süleymanpaşa | İnecik | C | Motorway Route | 260 | 65.7 | - | 65.7 | 65.7 | - | 49.4 | 42.4 | 50.5 | 44.1 | 42.7 | 65.8 | 42.4 | 65.8 | 65.7 | 42.7 | 16.4 | 0.0 | 15.3 | 21.6 | 0.0 |
| N14 | Tekirdağ | Süleymanpaşa | Nusratfakı | C | Motorway Route | 700 | 65.8 | - | 65.8 | 65.8 | - | 48.7 | 40.7 | 48.7 | 47.1 | 40.7 | 65.9 | 40.7 | 65.9 | 65.9 | 40.7 | 17.2 | 0.0 | 17.2 | 18.8 | 0.0 |
| N15 | Tekirdağ | Süleymanpaşa | Nusratfakı | R | Motorway Route | 460 | 59.3 | - | 59.3 | 59.3 | - | 49.1 | 41.2 | 51.1 | 42.6 | 40.9 | 59.7 | 41.2 | 59.9 | 59.4 | 40.9 | 10.6 | 0.0 | 8.8 | 16.8 | 0.0 |
| N16 | Tekirdağ | Süleymanpaşa | Güvençli | R | Motorway Route | 520 | 69.6 | - | 69.6 | 69.6 | - | 48.2 | 41.5 | 49.6 | 44.0 | 41.6 | 69.6 | 41.5 | 69.6 | 69.6 | 41.6 | 21.4 | 0.0 | 20.0 | 25.6 | 0.0 |
| N19 | Tekirdağ | Süleymanpaşa | Seymenli | R | Storage Area | 460 | 64.8 | - | 64.8 | 64.8 | - | 53.2 | 45.7 | 55.4 | 53.0 | 44.6 | 65.1 | 45.7 | 65.3 | 65.1 | 44.6 | 11.9 | 0.0 | 9.9 | 12.1 | 0.0 |
| N20 | Tekirdağ | Süleymanpaşa | Karahisarlı | R | Motorway Route | 1,500 | 57.8 | - | 57.8 | 57.8 | - | 48.1 | 46.5 | 50.1 | 45.8 | 46.3 | 58.2 | 46.5 | 58.5 | 58.1 | 46.3 | 10.1 | 0.0 | 8.4 | 12.3 | 0.0 |
| N21 | Tekirdağ | Süleymanpaşa | Bıyıkali | R | Storage Area | 2,200 | 49.6 | - | 49.6 | 49.6 | - | 51.0 | 43.7 | 52.2 | 46.1 | 43.4 | 53.4 | 43.7 | 54.1 | 51.2 | 43.4 | 2.4 | 0.0 | 1.9 | 5.1 | 0.0 |
| N23 | Tekirdağ | Süleymanpaşa | Yağcı | R | Storage Area | 450 | 51.4 | - | 51.4 | 51.4 | - | 49.6 | 43.5 | 50.8 | 46.1 | 43.5 | 53.6 | 43.5 | 54.1 | 52.5 | 43.5 | 4.0 | 0.0 | 3.3 | 6.4 | 0.0 |
| N24 | Tekirdağ | Süleymanpaşa | Karadeniz | R | Motorway Route | 330 | 37.6 | - | 37.6 | 37.6 | - | 49.8 | 43.6 | 50.7 | 46.0 | 43.6 | 50.1 | 43.6 | 50.9 | 46.6 | 43.6 | 0.3 | 0.0 | 0.2 | 0.6 | 0.0 |
| N25 | Tekirdağ | Süleymanpaşa | Yağcı | C | Motorway Route | 1,000 | 51.4 | - | 51.4 | 51.4 | - | 46.8 | 42.0 | 48.0 | 44.5 | 41.3 | 52.7 | 42.0 | 53.0 | 52.2 | 41.3 | 5.9 | 0.0 | 5.0 | 7.7 | 0.0 |
| N26 | Tekirdağ | Süleymanpaşa | Kayı | R | Motorway Route | 270 | 71.3 | - | 71.3 | 71.3 | - | 48.2 | 41.2 | 50.2 | 40.6 | 41.3 | 71.3 | 41.2 | 71.3 | 71.3 | 41.3 | 23.1 | 0.0 | 21.1 | 30.7 | 0.0 |
| N27 | Tekirdağ | Süleymanpaşa | Kayı | R | Motorway Route | 190 | 65.0 | - | 65.0 | 65.0 | - | 50.0 | 42.0 | 51.1 | 44.5 | 41.6 | 65.1 | 42.0 | 65.2 | 65.0 | 41.6 | 15.1 | 0.0 | 14.1 | 20.5 | 0.0 |
| N28 | Tekirdağ | Süleymanpaşa | Kayı | R | Motorway Route | 110 | 56.6 | - | 56.6 | 56.6 | - | 48.1 | 40.1 | 50.2 | 41.5 | 39.5 | 57.2 | 40.1 | 57.5 | 56.7 | 39.5 | 9.1 | 0.0 | 7.3 | 15.2 | 0.0 |
| N29 | Tekirdağ | Süleymanpaşa | İstiklal | R | Motorway Route | 450 | 61.7 | - | 61.7 | 61.7 | - | 49.9 | 41.2 | 51.0 | 44.5 | 41.4 | 62.0 | 41.2 | 62.1 | 61.8 | 41.4 | 12.1 | 0.0 | 11.1 | 17.3 | 0.0 |
| N30 | Tekirdağ | Süleymanpaşa | Kayı | R | Motorway Route | 600 | 66.0 | - | 66.0 | 66.0 | - | 50.4 | 42.2 | 52.7 | 41.6 | 42.6 | 66.1 | 42.2 | 66.2 | 66.0 | 42.6 | 15.7 | 0.0 | 13.5 | 24.4 | 0.0 |
| N31 | Tekirdağ | Süleymanpaşa | Kayı | R | Motorway Route | 660 | 63.5 | - | 63.5 | 63.5 | - | 49.8 | 41.6 | 51.4 | 43.0 | 41.8 | 63.7 | 41.6 | 63.8 | 63.5 | 41.8 | 13.9 | 0.0 | 12.4 | 20.5 | 0.0 |
| N32 | Tekirdağ | Süleymanpaşa | Köseilyas | R | Motorway Route | 250 | 60.4 | - | 60.4 | 60.4 | - | 51.2 | 42.4 | 52.5 | 45.1 | 42.0 | 60.9 | 42.4 | 61.1 | 60.5 | 42.0 | 9.7 | 0.0 | 8.6 | 15.4 | 0.0 |
| N33 | Tekirdağ | Süleymanpaşa | Köseilyas | R | Motorway Route | 220 | 67.4 | - | 67.4 | 67.4 | - | 48.7 | 42.1 | 50.7 | 43.8 | 41.7 | 67.5 | 42.1 | 67.5 | 67.4 | 41.7 | 18.8 | 0.0 | 16.8 | 23.6 | 0.0 |

| Measurement Point | Measurement Location | | | | | | Modelled Noise Level (originated from Project activities) (dBA) | | | | | Baseline Noise Levels (dBA)** | | | | | Modelled Noise Level + The Ambient Noise Level (dBA) | | | | | Difference between ambient and modelled sound levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | Province | District | Village / Neighbourhood | Receptor Type* | Nearest Project Component | Distance to Nearest Project Component (m) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N34 | Tekirdağ | Süleymanpaşa | Köseilyas | R | Motorway Route | 150 | 66.2 | - | 66.2 | 66.2 | - | 50.2 | 43.1 | 51.2 | 45.1 | 43.2 | 66.3 | 43.1 | 66.3 | 66.2 | 43.2 | 16.1 | 0.0 | 15.1 | 21.1 | 0.0 |
| N35 | Tekirdağ | Süleymanpaşa | Köseilyas | C | Storage Area | 290 | 59.2 | - | 59.2 | 59.2 | - | 49.9 | 42.3 | 50.0 | 43.7 | 42.3 | 59.7 | 42.3 | 59.7 | 59.3 | 42.3 | 9.8 | 0.0 | 9.7 | 15.6 | 0.0 |
| N36 | Tekirdağ | Süleymanpaşa | Köseilyas | R | Motorway Route | 1,000 | 60.0 | - | 60.0 | 60.0 | - | 50.4 | 42.1 | 52.6 | 42.0 | 42.5 | 60.5 | 42.1 | 60.7 | 60.1 | 42.5 | 10.1 | 0.0 | 8.1 | 18.1 | 0.0 |
| N37 | Tekirdağ | Süleymanpaşa | Bahçelievler | R | Motorway Route | 50 | 61.4 | - | 61.4 | 61.4 | - | 49.0 | 40.3 | 50.0 | 43.4 | 40.0 | 61.6 | 40.3 | 61.7 | 61.5 | 40.0 | 12.6 | 0.0 | 11.7 | 18.1 | 0.0 |
| N38 | Tekirdağ | Süleymanpaşa | Gazioğlu | R | Motorway Route | 960 | 63.5 | - | 63.5 | 63.5 | - | 49.0 | 40.9 | 51.1 | 45.3 | 40.8 | 63.7 | 40.9 | 63.7 | 63.6 | 40.8 | 14.7 | 0.0 | 12.6 | 18.3 | 0.0 |
| N39 | Tekirdağ | Süleymanpaşa | Husunlu | R | Motorway Route | 560 | 68.7 | - | 68.7 | 68.7 | - | 49.6 | 43.1 | 51.2 | 46.1 | 42.7 | 68.8 | 43.1 | 68.8 | 68.7 | 42.7 | 19.2 | 0.0 | 17.6 | 22.6 | 0.0 |
| N40 | Tekirdağ | Süleymanpaşa | Karaevli | R | Motorway Route | 900 | 63.7 | - | 63.7 | 63.7 | - | 49.0 | 42.5 | 51.1 | 47.0 | 42.5 | 63.8 | 42.5 | 63.9 | 63.8 | 42.5 | 14.8 | 0.0 | 12.8 | 16.8 | 0.0 |
| N42 | Tekirdağ | Çorlu | Yenice | R | Motorway Route | 660 | 66.1 | - | 66.1 | 66.1 | - | 51.6 | 42.7 | 52.8 | 45.4 | 42.3 | 66.3 | 42.7 | 66.3 | 66.1 | 42.3 | 14.7 | 0.0 | 13.5 | 20.7 | 0.0 |
| N43 | Tekirdağ | Çorlu | Türkgücü | R | Borrow Pit | 820 | 55.3 | - | 55.3 | 55.3 | - | 50.1 | 42.0 | 51.4 | 44.1 | 41.6 | 56.4 | 42.0 | 56.8 | 55.6 | 41.6 | 6.3 | 0.0 | 5.4 | 11.5 | 0.0 |
| N44 | Tekirdağ | Marmaraereğlisi | Çeşmeli | R | Motorway Route | 60 | 86.5 | - | 86.5 | 86.5 | - | 48.8 | 42.5 | 51.1 | 41.5 | 42.9 | 86.5 | 42.5 | 86.5 | 86.5 | 42.9 | 37.7 | 0.0 | 35.4 | 45.0 | 0.0 |
| N45 | Tekirdağ | Marmaraereğlisi | Çeşmeli | R | Storage Area | 960 | 51.4 | - | 51.4 | 51.4 | - | 50.2 | 42.5 | 53.0 | 44.0 | 41.6 | 53.9 | 42.5 | 55.3 | 52.1 | 41.6 | 3.7 | 0.0 | 2.3 | 8.1 | 0.0 |
| N46 | Tekirdağ | Marmaraereğlisi | Türkmenli | R | Storage Area | 850 | 49.9 | - | 49.9 | 49.9 | - | 47.2 | 41.1 | 49.5 | 39.7 | 42.0 | 51.8 | 41.1 | 52.7 | 50.3 | 42.0 | 4.6 | 0.0 | 3.2 | 10.6 | 0.0 |
| N47 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | Motorway Route | 1,050 | 53.9 | - | 53.9 | 53.9 | - | 50.4 | 42.6 | 53.1 | 40.5 | 42.6 | 55.5 | 42.6 | 56.5 | 54.1 | 42.6 | 5.1 | 0.0 | 3.4 | 13.6 | 0.0 |
| N48 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | Motorway Route | 1,080 | 57.7 | - | 57.7 | 57.7 | - | 51.7 | 42.4 | 54.5 | 42.4 | 42.5 | 58.7 | 42.4 | 59.4 | 57.8 | 42.5 | 7.0 | 0.0 | 4.9 | 15.4 | 0.0 |
| N49 | Tekirdağ | Çorlu | Seymen | R | Storage Area | 850 | 53.9 | - | 53.9 | 53.9 | - | 52.0 | 43.9 | 53.7 | 44.2 | 44.5 | 56.1 | 43.9 | 56.8 | 54.3 | 44.5 | 4.1 | 0.0 | 3.1 | 10.1 | 0.0 |
| N50 | Tekirdağ | Çorlu | Seymen | R | Motorway Route | 500 | 69.0 | - | 69.0 | 69.0 | - | 49.4 | 43.6 | 50.0 | 46.3 | 43.5 | 69.0 | 43.6 | 69.1 | 69.0 | 43.5 | 19.6 | 0.0 | 19.1 | 22.7 | 0.0 |
| N51 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | Motorway Route | 280 | 65.8 | - | 65.8 | 65.8 | - | 50.0 | 42.5 | 50.9 | 46.1 | 42.4 | 65.9 | 42.5 | 65.9 | 65.8 | 42.4 | 15.9 | 0.0 | 15.0 | 19.7 | 0.0 |
| N52 | Tekirdağ | Çorlu | Seymen | R | Motorway Route | 330 | 66.5 | - | 66.5 | 66.5 | - | 48.3 | 42.1 | 48.6 | 43.2 | 42.3 | 66.6 | 42.1 | 66.6 | 66.5 | 42.3 | 18.3 | 0.0 | 18.0 | 23.3 | 0.0 |
| N53 | Tekirdağ | Marmaraereğlisi | Sultanköy | R | Motorway Route | 1,220 | 59.5 | - | 59.5 | 59.5 | - | 46.4 | 40.4 | 47.1 | 42.0 | 40.6 | 59.7 | 40.4 | 59.7 | 59.6 | 40.6 | 13.3 | 0.0 | 12.6 | 17.6 | 0.0 |
| N55 | İstanbul | Silivri | Gümüşkaya Merkez | R | Storage Area | 1,450 | 45.1 | - | 45.1 | 45.1 | - | 47.5 | 39.1 | 48.6 | 39.5 | 39.5 | 49.5 | 39.1 | 50.2 | 46.2 | 39.5 | 2.0 | 0.0 | 1.6 | 6.7 | 0.0 |
| N56 | İstanbul | Silivri | Fevzipaşa | C | Motorway Route | 260 | 75.5 | - | 75.5 | 75.5 | - | 51.2 | 44.0 | 51.8 | 48.2 | 43.6 | 75.5 | 44.0 | 75.5 | 75.5 | 43.6 | 24.3 | 0.0 | 23.7 | 27.3 | 0.0 |
| N57 | İstanbul | Silivri | Balaban | C | Motorway Route | 140 | 59.3 | - | 59.3 | 59.3 | - | 47.8 | 41.8 | 49.6 | 41.4 | 42.2 | 59.6 | 41.8 | 59.7 | 59.4 | 42.2 | 11.8 | 0.0 | 10.1 | 18.0 | 0.0 |
| N58 | İstanbul | Silivri | İsmetpaşa | R | Motorway Route | 650 | 64.7 | - | 64.7 | 64.7 | - | 47.7 | 42.1 | 49.6 | 44.8 | 42.0 | 64.8 | 42.1 | 64.8 | 64.7 | 42.0 | 17.1 | 0.0 | 15.2 | 19.9 | 0.0 |
| N59 | İstanbul | Silivri | Balaban | R | Motorway Route | 90 | 83.3 | - | 83.3 | 83.3 | - | 49.8 | 41.0 | 48.6 | 43.2 | 40.6 | 83.3 | 41.0 | 83.3 | 83.3 | 40.6 | 33.5 | 0.0 | 34.7 | 40.1 | 0.0 |
| N61 | İstanbul | Silivri | Balaban | R | Borrow Pit | 1,050 | 47.2 | - | 47.2 | 47.2 | - | 51.0 | 44.0 | 48.3 | 48.4 | 43.4 | 52.5 | 44.0 | 50.8 | 50.9 | 43.4 | 1.5 | 0.0 | 2.5 | 2.5 | 0.0 |
| N62 | İstanbul | Silivri | Sancaktepe | R | Motorway Route | 1,000 | 62.6 | - | 62.6 | 62.6 | - | 51.0 | 42.8 | 51.8 | 47.2 | 41.9 | 62.9 | 42.8 | 62.9 | 62.7 | 41.9 | 11.9 | 0.0 | 11.1 | 15.5 | 0.0 |
| N63 | İstanbul | Silivri | Çeltik | R | Motorway Route | 600 | 61.6 | - | 61.6 | 61.6 | - | 48.1 | 41.0 | 48.0 | 43.9 | 40.8 | 61.8 | 41.0 | 61.8 | 61.7 | 40.8 | 13.7 | 0.0 | 13.8 | 17.8 | 0.0 |
| N64 | İstanbul | Silivri | Semizkumlar | R | Motorway Route | 1,160 | 60.9 | - | 60.9 | 60.9 | - | 53.3 | 44.0 | 52.5 | 43.8 | 45.0 | 61.6 | 44.0 | 61.5 | 61.0 | 45.0 | 8.3 | 0.0 | 9.0 | 17.2 | 0.0 |
| N65 | İstanbul | Silivri | Yolcatı | R | Storage Area | 750 | 61.0 | - | 61.0 | 61.0 | - | 51.7 | 44.8 | 52.3 | 47.4 | 44.2 | 61.5 | 44.8 | 61.5 | 61.2 | 44.2 | 9.8 | 0.0 | 9.2 | 13.8 | 0.0 |

| Measurement Point | Measurement Location | | | | | | Modelled Noise Level (originated from Project activities) (dBA) | | | | | Baseline Noise Levels (dBA)** | | | | | Modelled Noise Level + The Ambient Noise Level (dBA) | | | | | Difference between ambient and modelled sound levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Province | District | Village / Neighbourhood | Receptor Type* | Nearest Project Component | Distance to Nearest Project Component (m) | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | | | | | | | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N66 | İstanbul | Silivri | Alipaşa | C | Motorway Route | 1,110 | 61.1 | - | 61.1 | 61.1 | - | 48.1 | 42.5 | 48.6 | 45.4 | 41.7 | 61.3 | 42.5 | 61.3 | 61.2 | 41.7 | 13.2 | 0.0 | 12.7 | 15.8 | 0.0 |
| AN1*** | Tekirdağ | Şarköy | Çengelli | R | Quarry | 800 | 44.0 | - | 44.0 | 44.0 | - | 51.0 | 44.0 | 48.3 | 48.4 | 43.4 | 51.8 | 44.0 | 49.7 | 49.7 | 43.4 | 0.8 | 0.0 | 1.4 | 1.3 | 0.0 |
| AN2*** | Tekirdağ | Süleymanpaşa | Osmanlı | R | Quarry | 550 | 51.8 | - | 51.8 | 51.8 | - | 51.0 | 44.0 | 48.3 | 48.4 | 43.4 | 54.4 | 44.0 | 53.4 | 53.4 | 43.4 | 3.4 | 0.0 | 5.1 | 5.0 | 0.0 |
| AN3*** | Tekirdağ | Muratlı | Fatih | R | Quarry | 320 | 56.2 | - | 56.2 | 56.2 | - | 51.0 | 44.0 | 48.3 | 48.4 | 43.4 | 57.3 | 44.0 | 56.9 | 56.9 | 43.4 | 6.3 | 0.0 | 8.6 | 8.5 | 0.0 |
| AN4*** | İstanbul | Silivri | Danamandıra | R | Quarry | 40 | 62.2 | - | 62.2 | 62.2 | - | 51.0 | 44.0 | 48.3 | 48.4 | 43.4 | 62.5 | 44.0 | 62.4 | 62.4 | 43.4 | 11.5 | 0.0 | 14.1 | 14.0 | 0.0 |
| IFC Noise Standards[1,2] | Industrial; commercial areas | | | | | | **70** | **70** | - | - | - | **70** | **70** | - | - | - | **70** | **70** | - | - | - | **3** | **3** | - | - | - |
| | Residential; institutional; educational areas | | | | | | **55** | **45** | - | - | - | **55** | **45** | - | - | - | **55** | **45** | - | - | - | **3** | **3** | - | - | - |
| Turkish Noise Limit Values[3,4] | Industrial facilities, transportation sources | | | | | | - | - | **65** | **60** | **55** | - | - | **65** | **60** | **55** | - | - | **65** | **60** | **55** | - | - | - | - | - |

**Notes:**

** Residential (R) or Commercial (C)*

*** For the worst-case scenario simulation, modelled noise levels were cumulatively assessed by considering the highest baseline noise levels measured.*

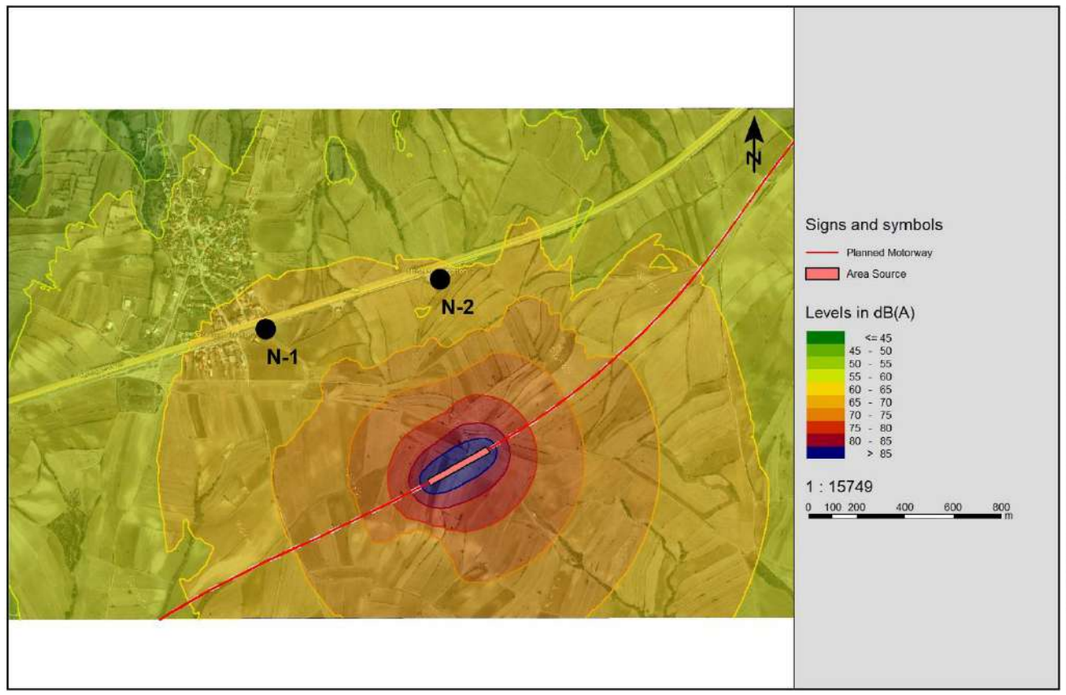
**** In order to determine the noise impacts resulting from Tepeköy, Osmanlı, Muratlı and Danamandıra Quarries as well, closest sensitive receptors to these quarries are determined as AN1, AN2, AN3 and AN4, respectively. Noise impacts at these receptors are calculated based on the assumption that baseline noise levels at these receptors will be similar to N61 which has similar study area conditions compared to these locations.*

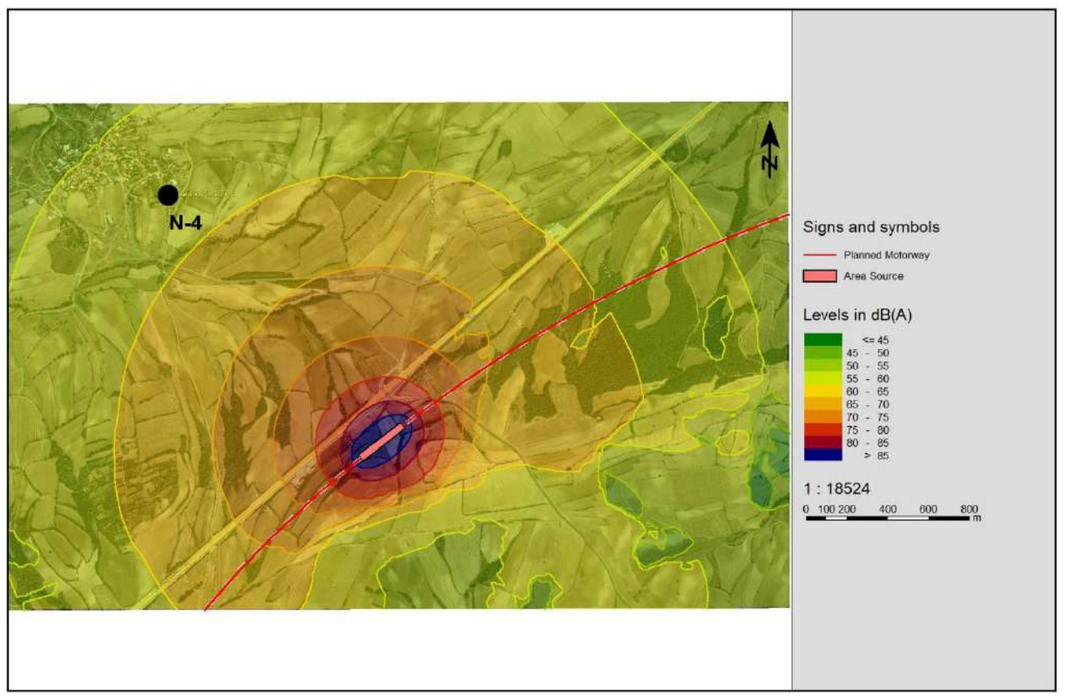
[1] *IFC Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: Environmental - Noise Management;*

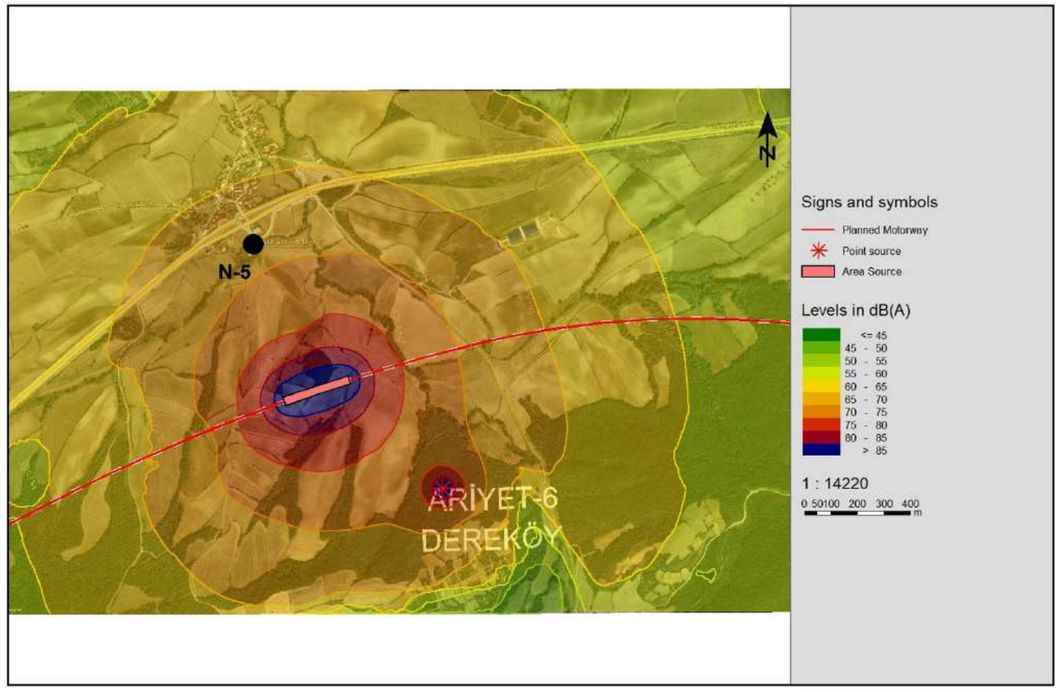
[2] *IFC Guidelines provide noise standards for two-time intervals in 24 hours: day (07:00 to 22:00), and night (22:00 to 07:00).*

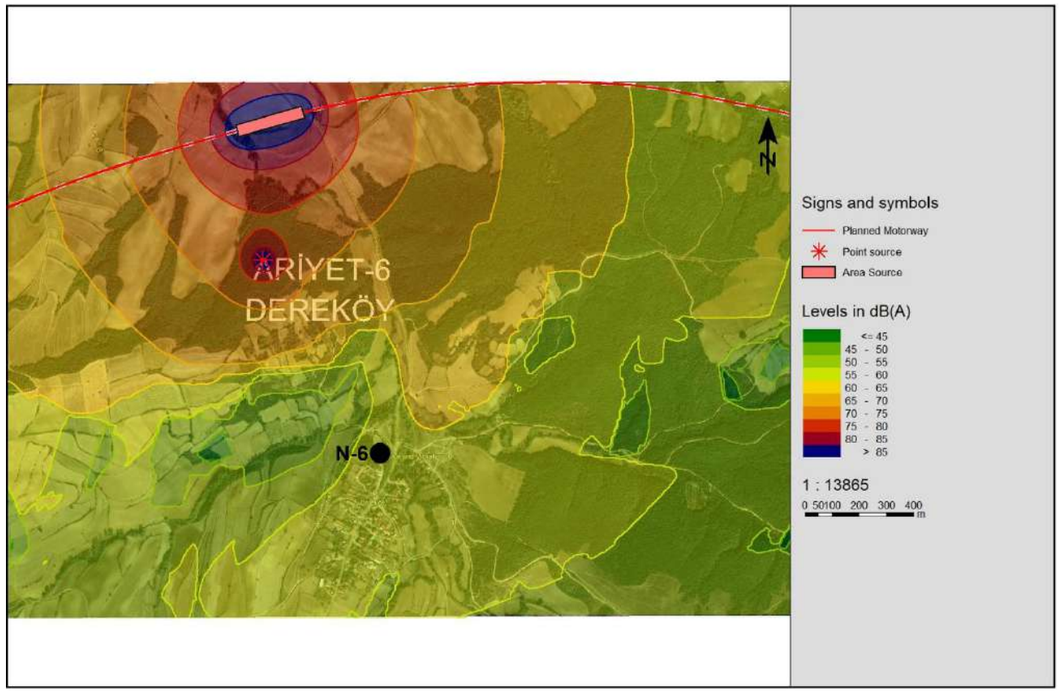
[3] *Regulation on Control of Environmental Noise;*

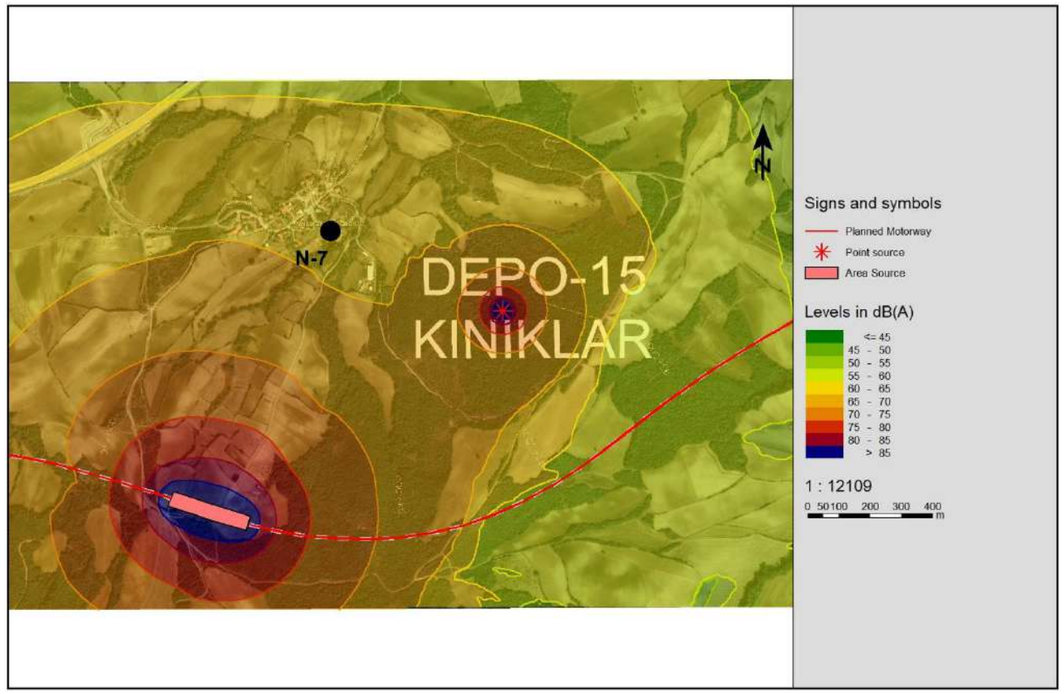
[4] *Regulation on Control of Environmental Noise provides noise* standards for three-time intervals in 24 hours: day (07:00 to 19:00), evening (19:00 to 23:00) and night (23:00 to 07:00).

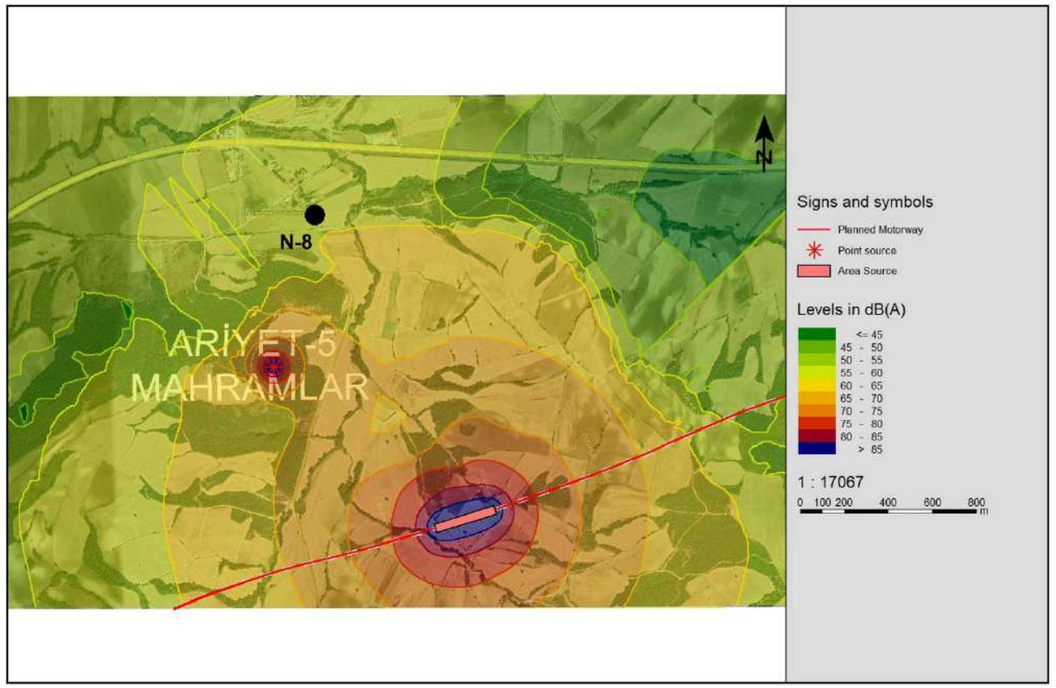

N-1
N-2
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 15749
0 100 200 400 600 800 m

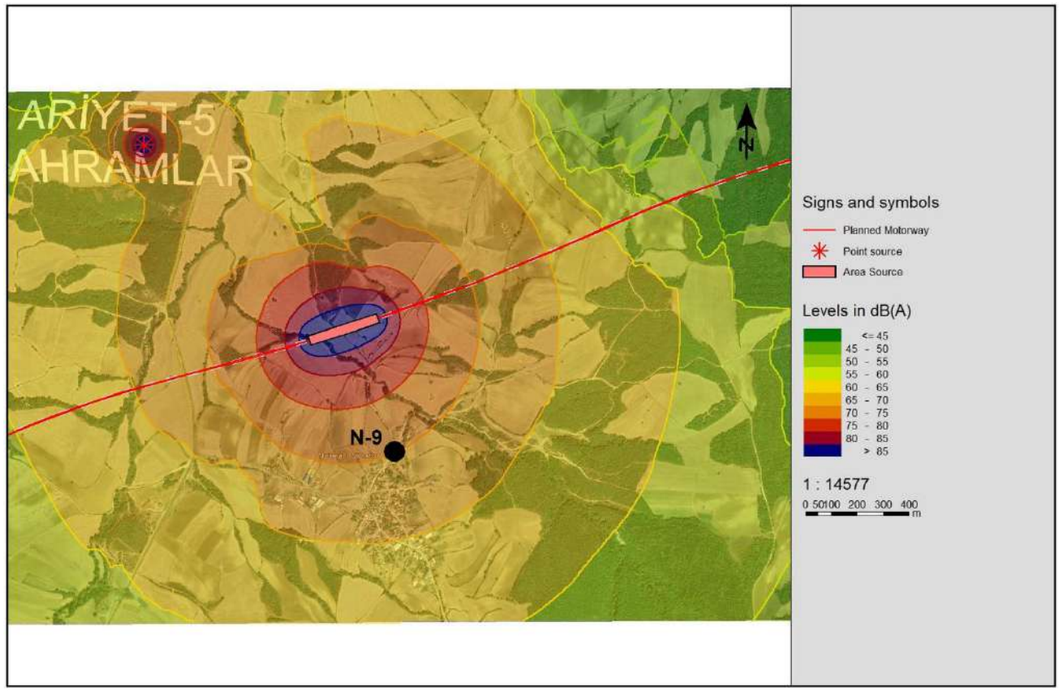

N-4
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 18524
0 100 200 400 600 800 m

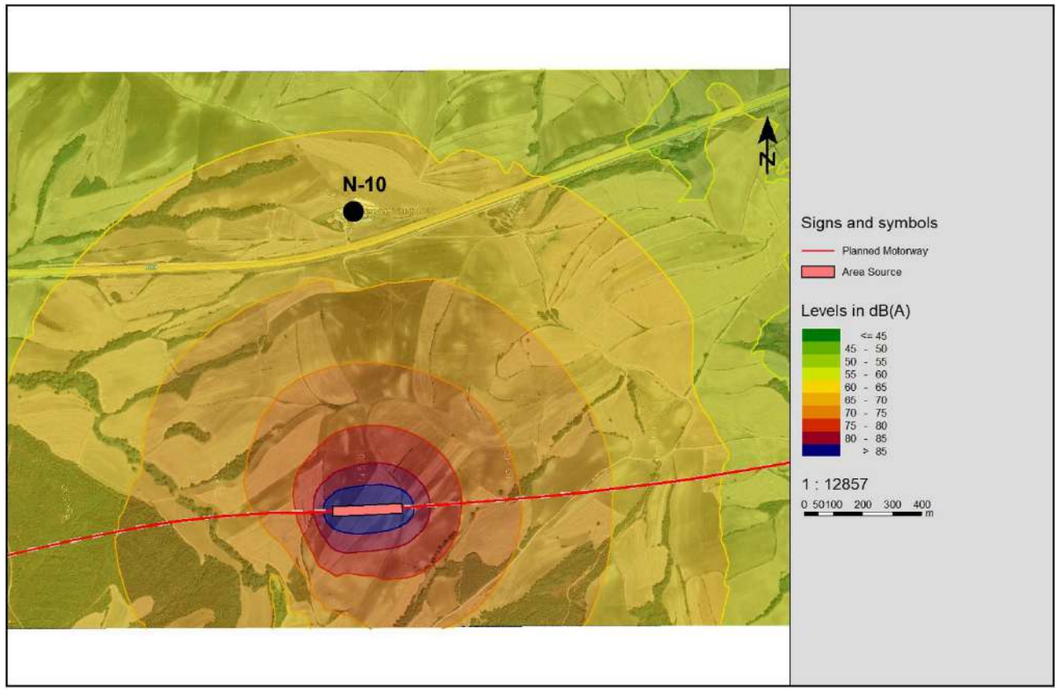

N-5
ARİYET-6
DEREKÖY
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14220
0 50100 200 300 400 m

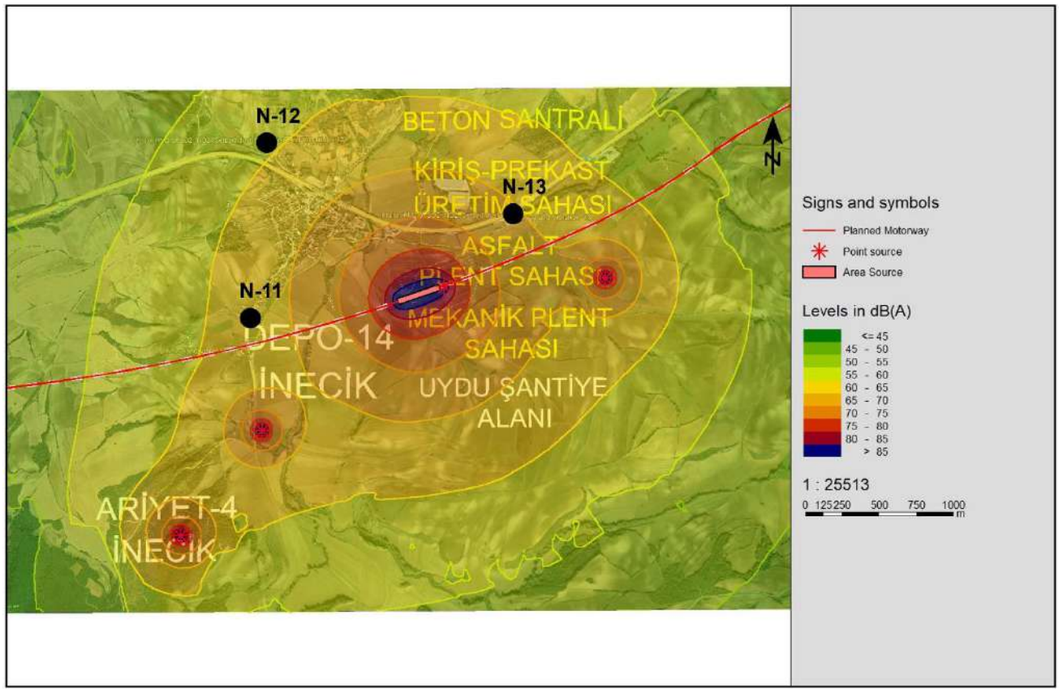

ARİYET-6
DEREKÖY
N-6
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 13865
0 50100 200 300 400 m

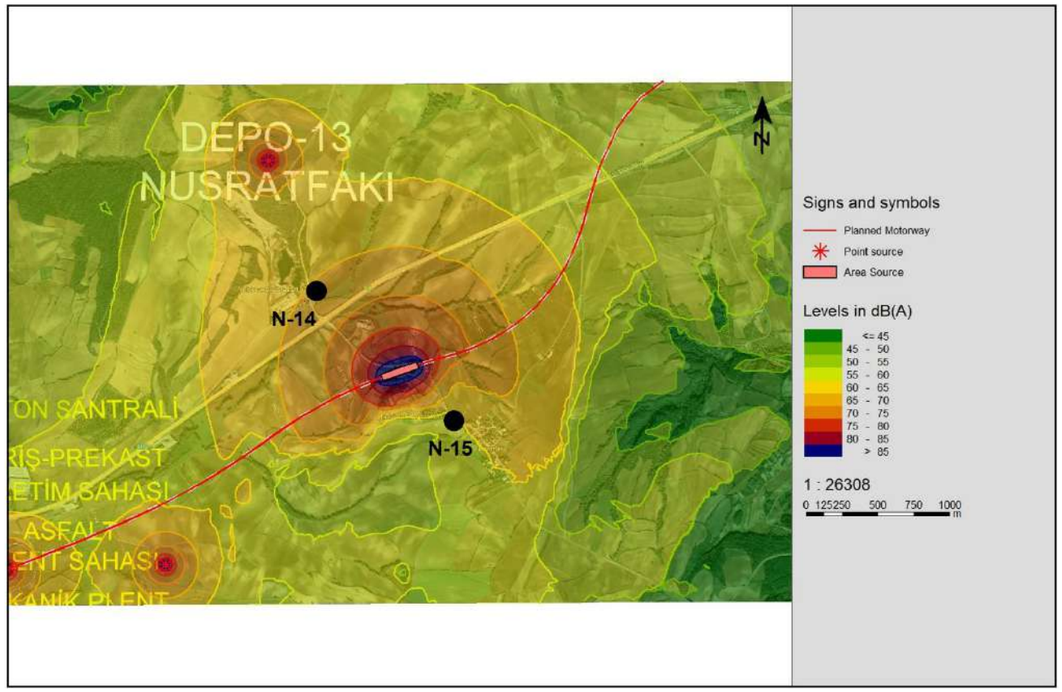

N-7
DEPO-15
KINIKLAR
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 12109
0 50100 200 300 400 m

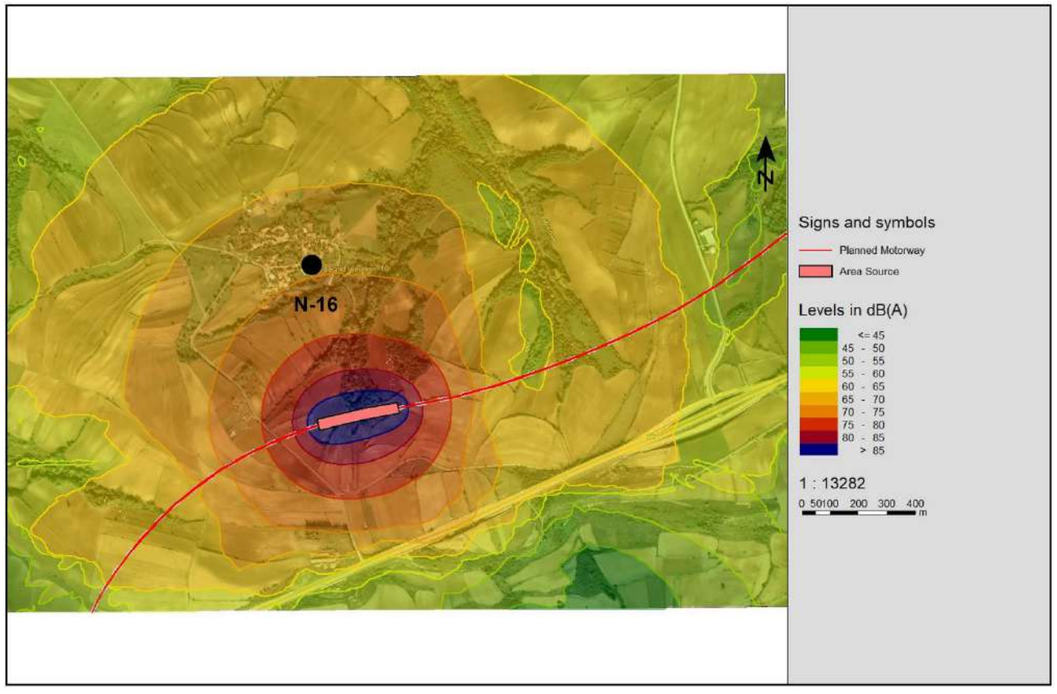

N-8
ARİYET-5
MAHRAMLAR
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 17067
0 100 200 400 600 800 m

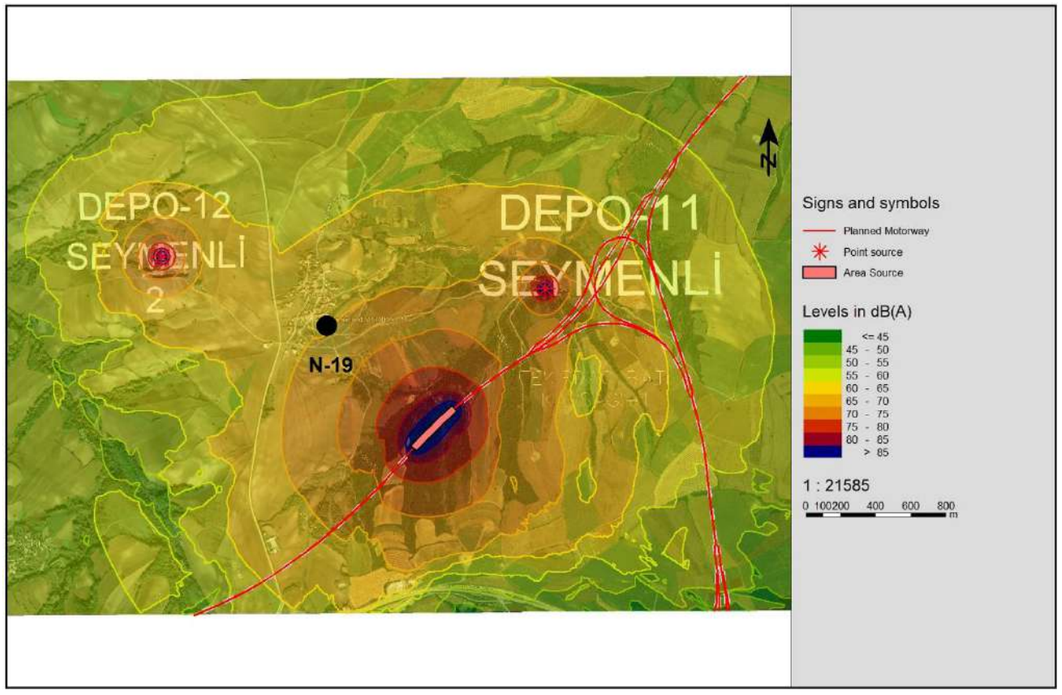

ARİYET-5
AHRAMLAR
N-9
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14577
0 50100 200 300 400 m

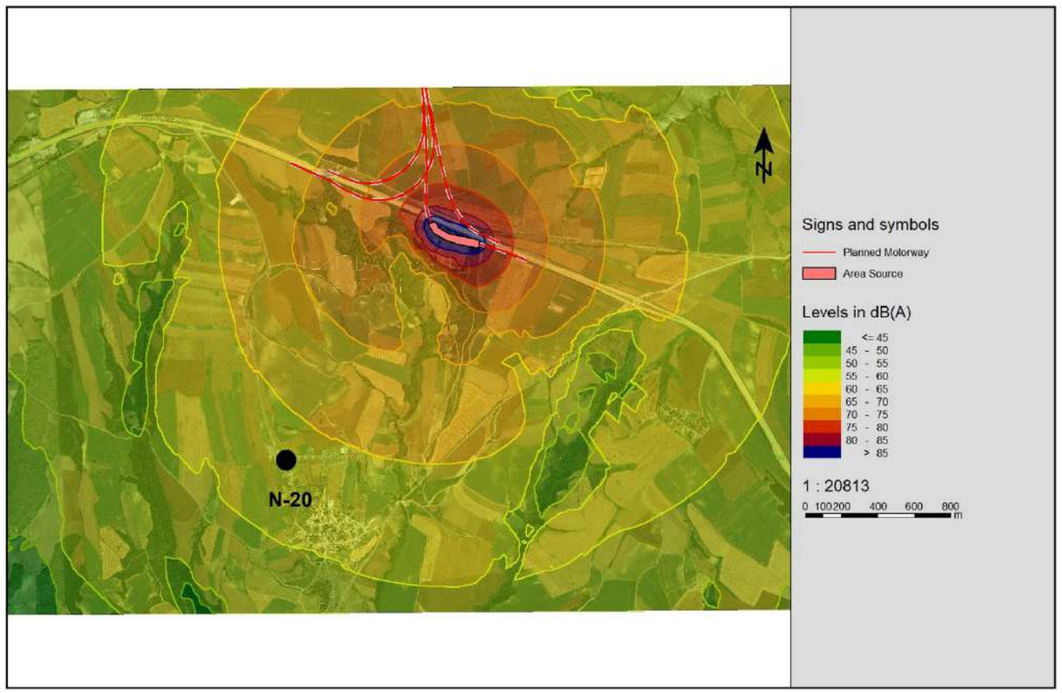

N-10
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 12857
0 50100 200 300 400 m

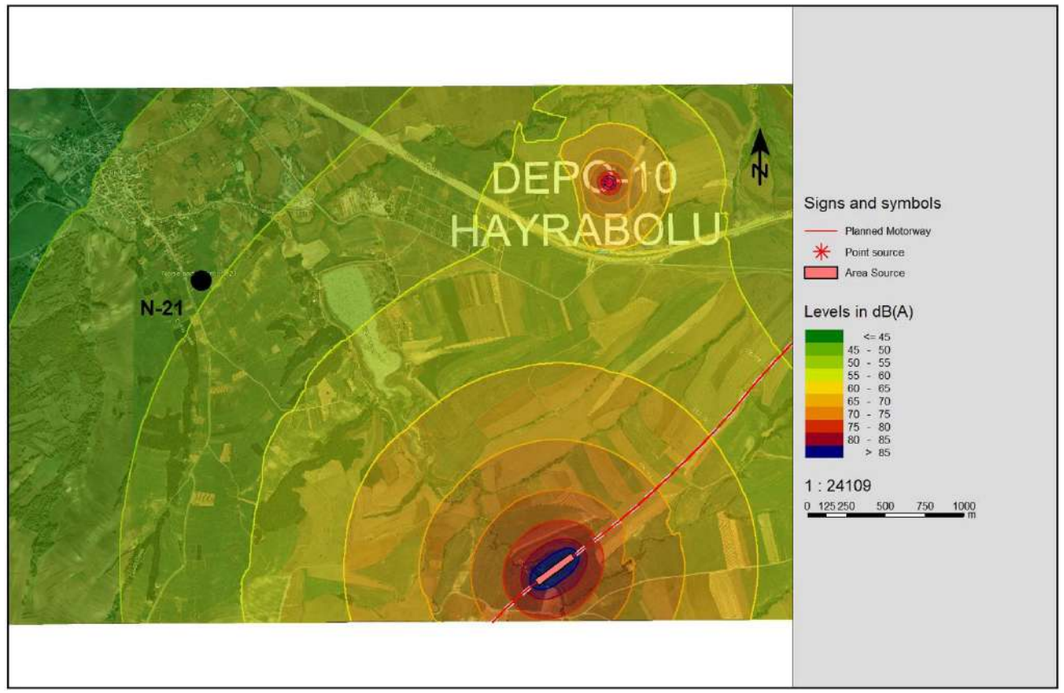

N-12
BETON SANTRALİ
KİRİŞ-PREKAST
ÜRETİM SAHASI
N-13
ASFALT
PLENT SAHASI
N-11
MEKANİK PLENT
SAHASI
DEPO-14
İNECİK
UYDU ŞANTİYE
ALANI
ARİYET-4
İNECİK
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 25513
0 125250 500 750 1000 m

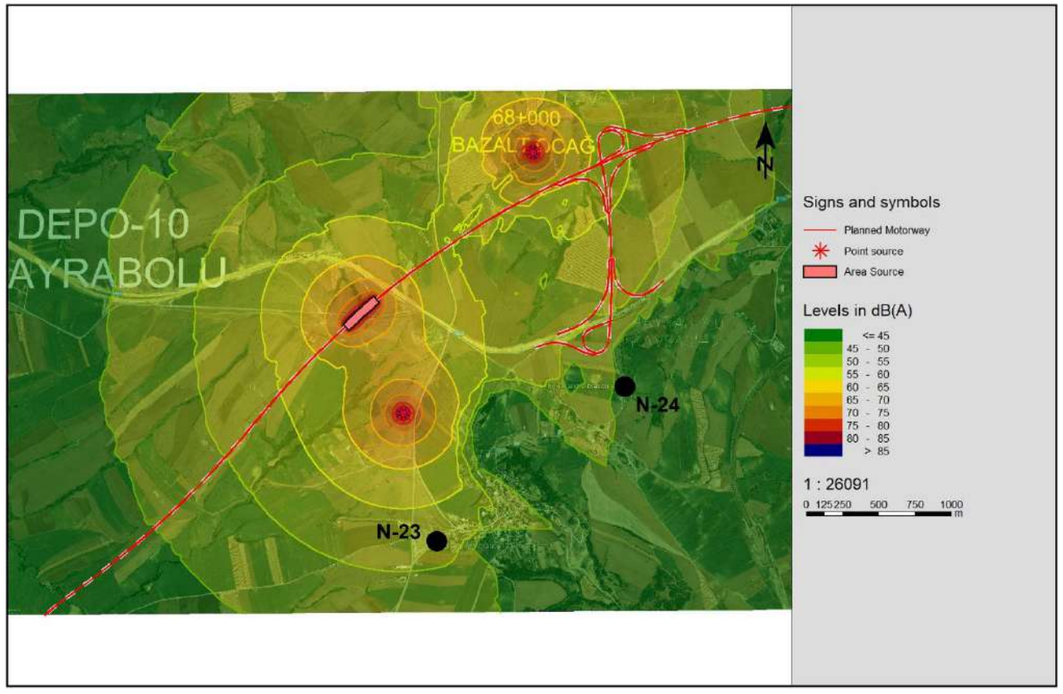

DEPO-13
NUSRATFAKI
N-14
N-15
ON SANTRALİ
RİŞ-PREKAST
ETİM SAHASI
ASFALT
ENT SAHASI
KANİK PLENT
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 26308
0 125250 500 750 1000 m

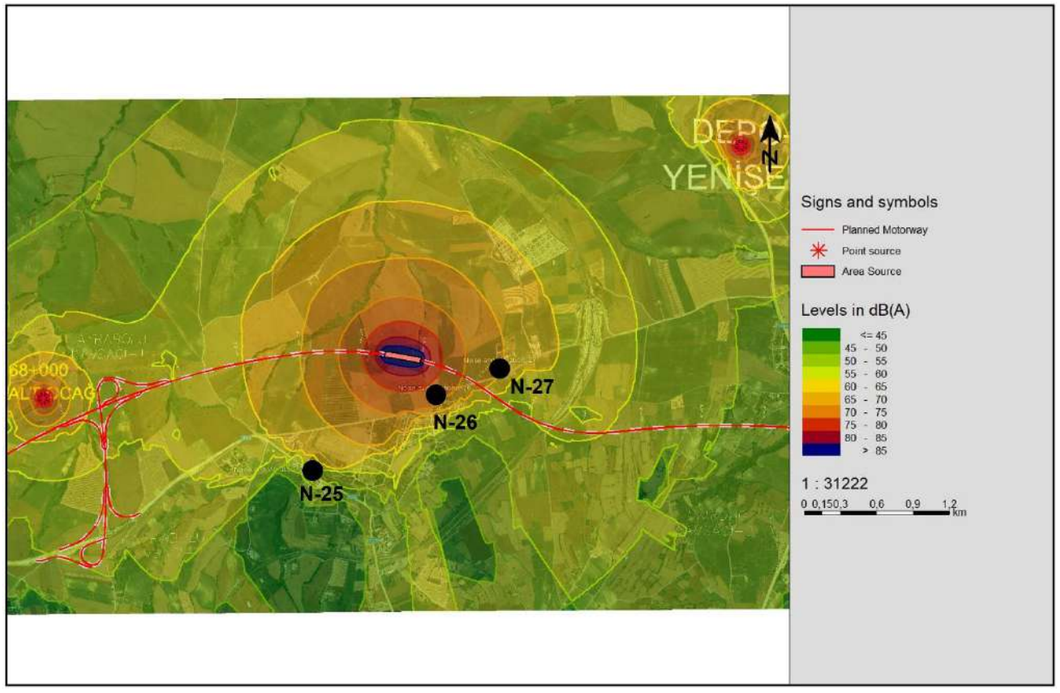

N-16
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 13282
0 50100 200 300 400 m

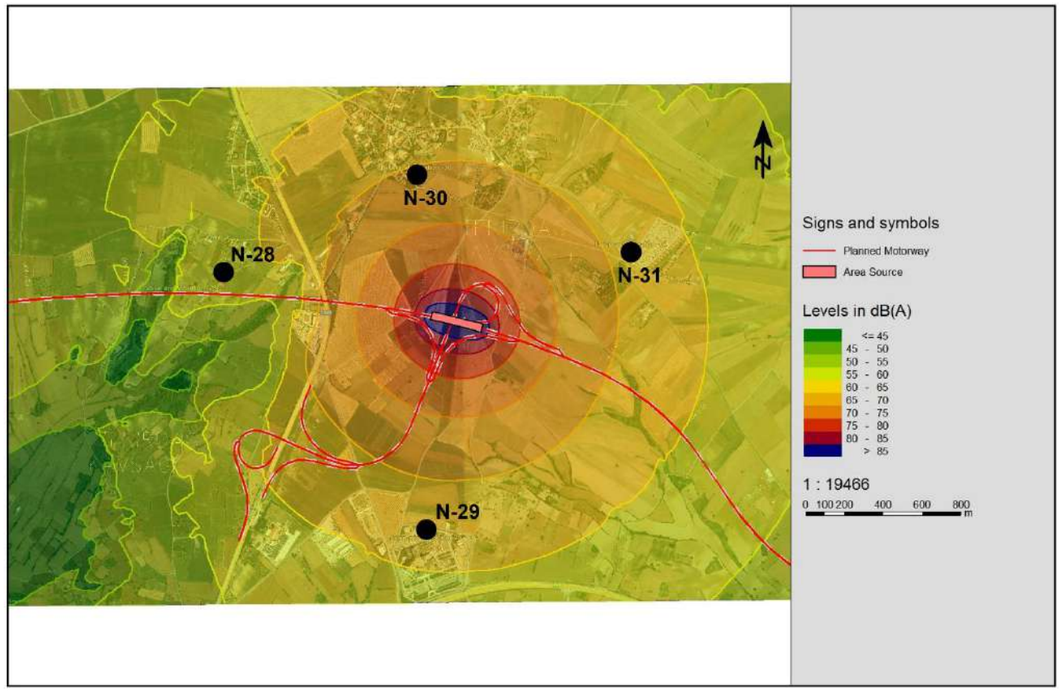

DEPO-12
SEYMENLİ
2
DEPO-11
SEYMENLİ
N-19
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 21585
0 100200 400 600 800 m

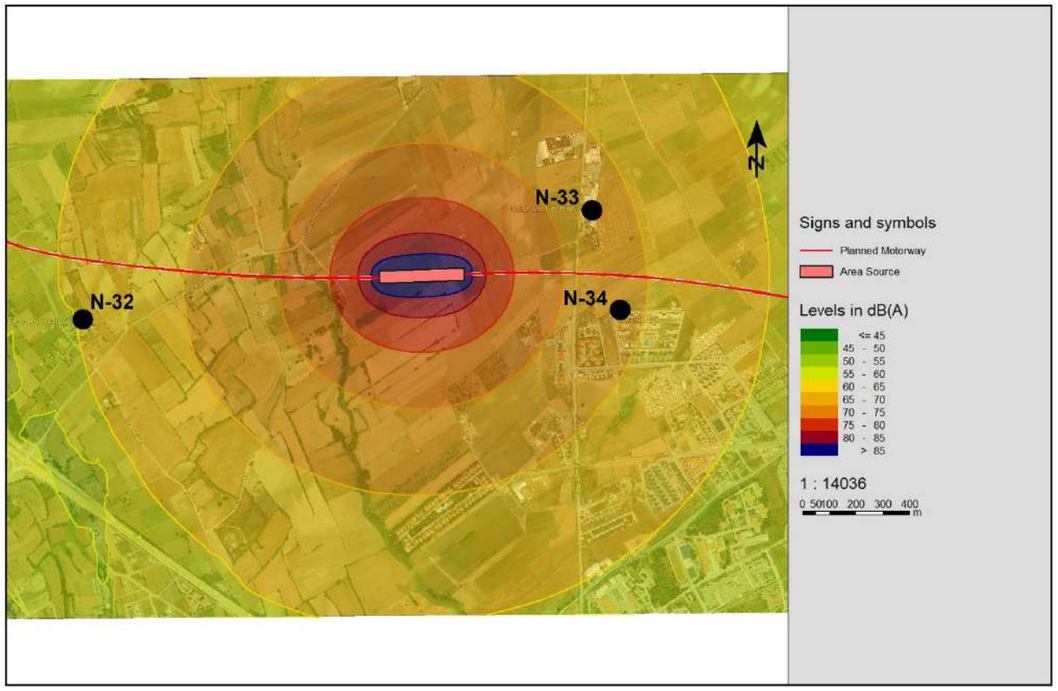

N-20
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 20813
0 100 200 400 600 800 m

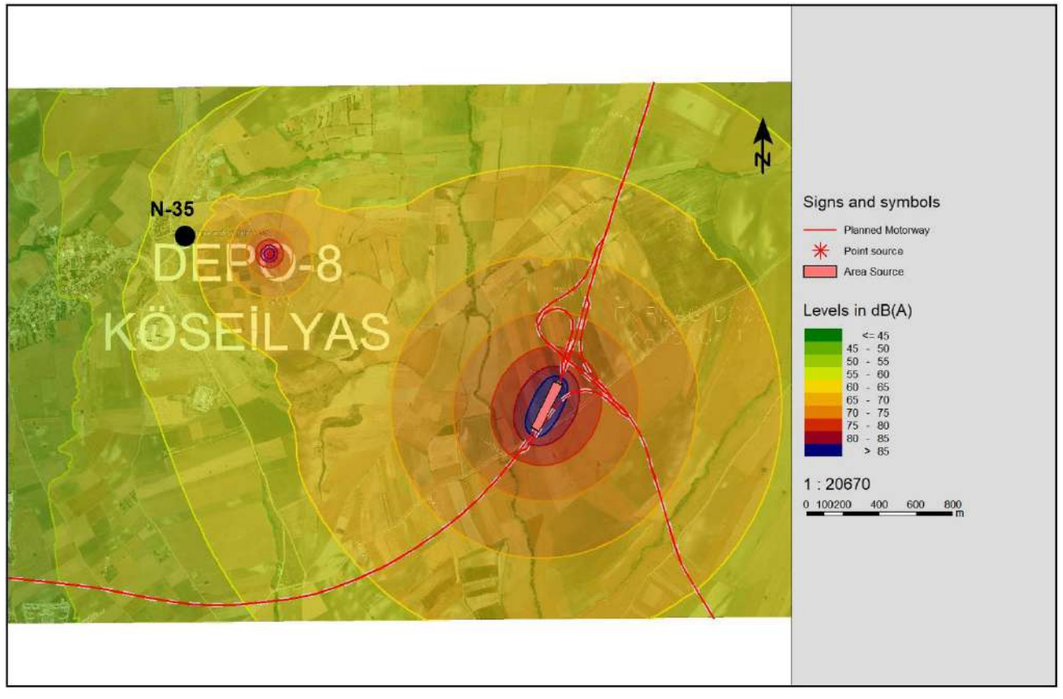

DEPO-10
HAYRABOLU
N-21
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 24109
0 125 250 500 750 1000 m

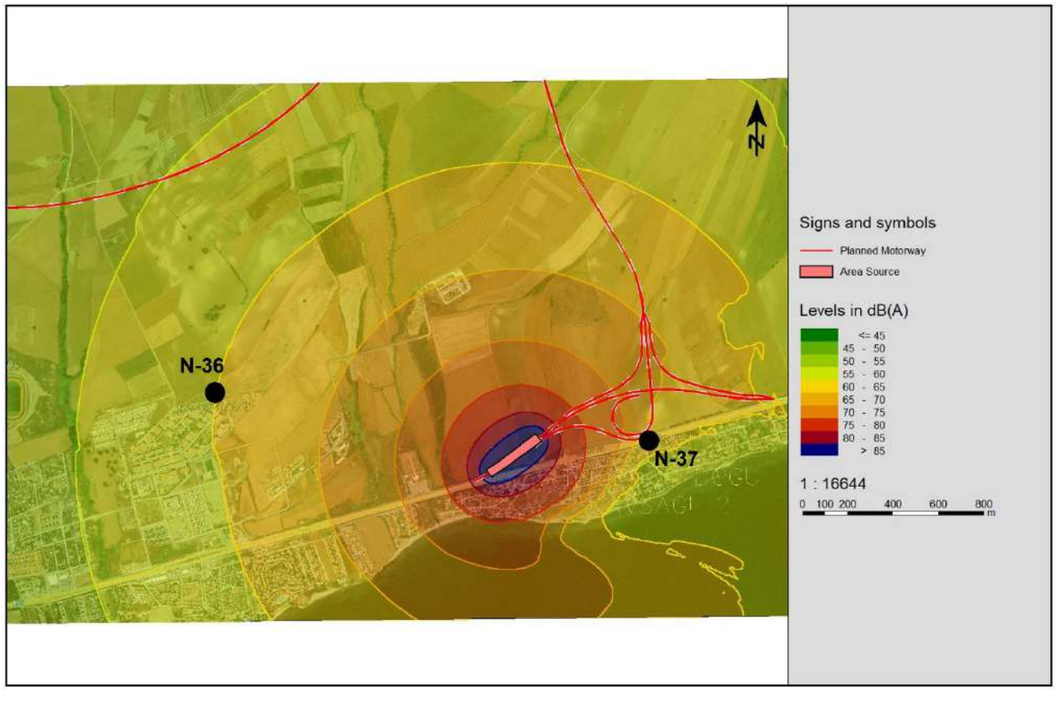

DEPO-10
AYRABOLU
68+000
N-24
N-23
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 26091
0 125 250 500 750 1000 m

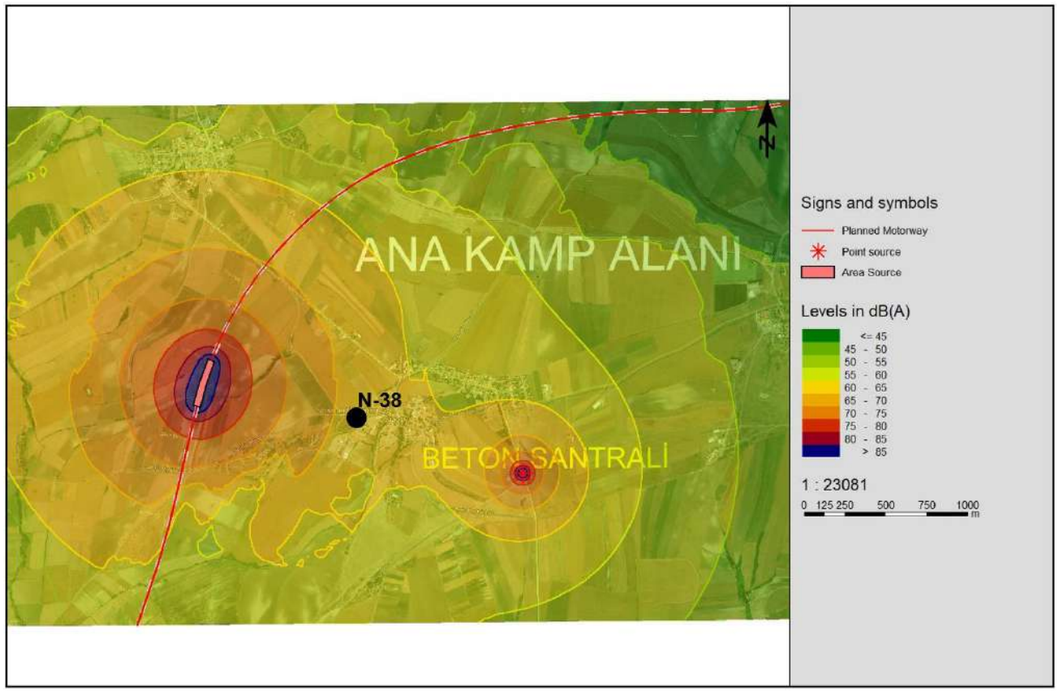

N-27
N-26
N-25
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 31222
0 0,15 0,3 0,6 0,9 1,2 km

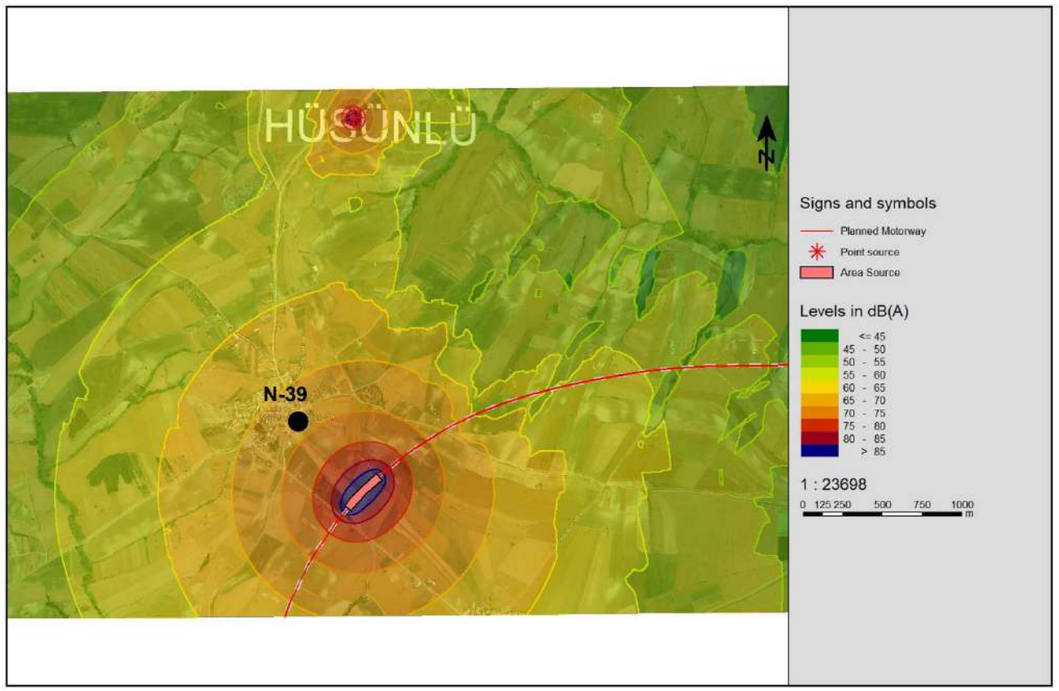

N-28
N-30
N-31
N-29
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 19466
0 100 200 400 600 800 m

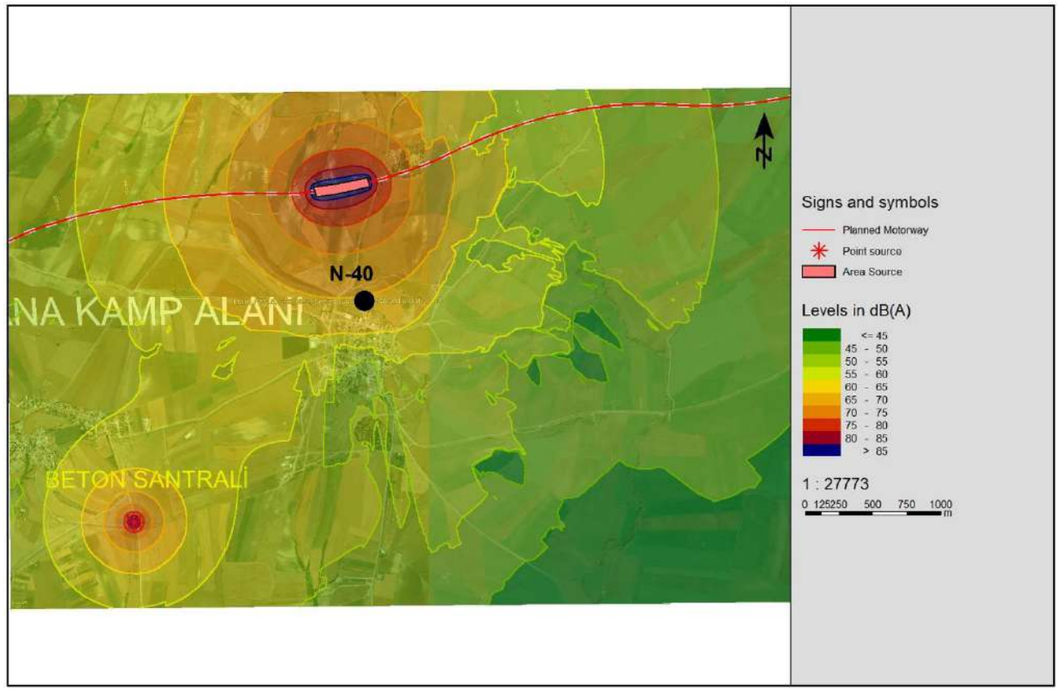

N-32
N-33
N-34
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14036
0 50 100 200 300 400 m

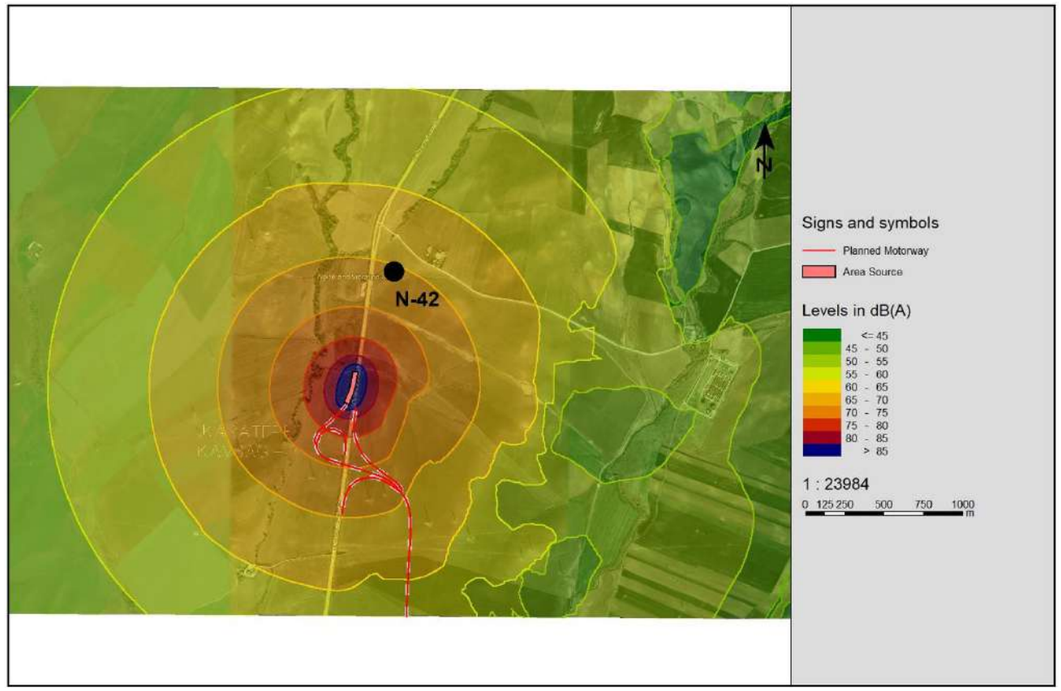

N-35
DEPO-8
KÖSEİLYAS
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 20670
0 100 200 400 600 800 m

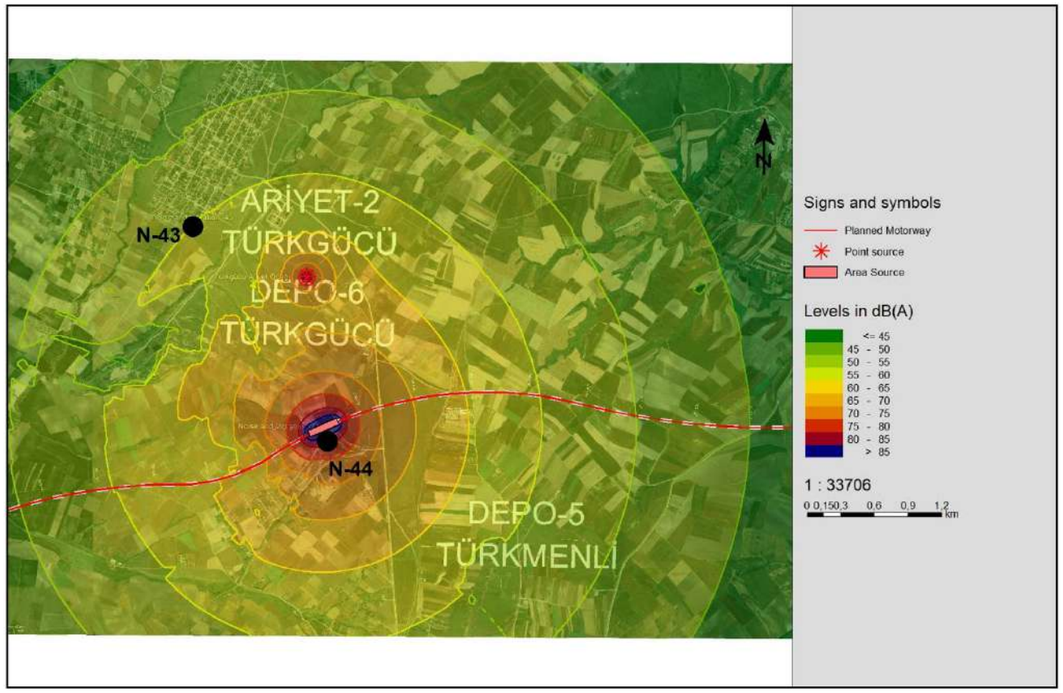

N-36
N-37
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 16644
0 100 200 400 600 800 m

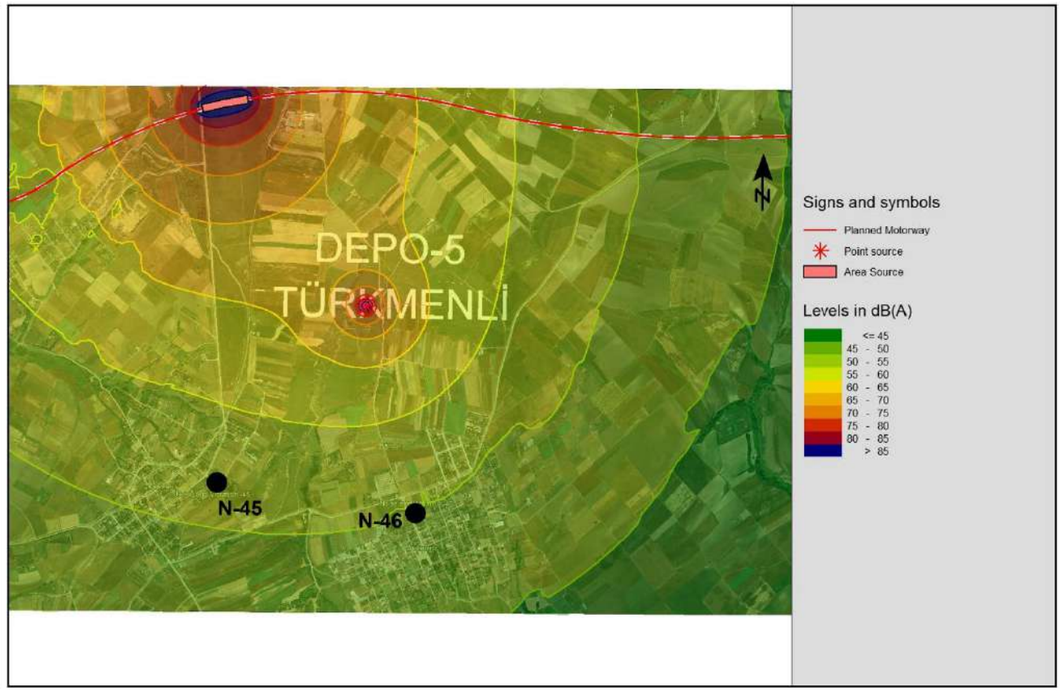

ANA KAMP ALANİ
N-38
BETON SANTRALİ
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 23081
0 125 250 500 750 1000 m

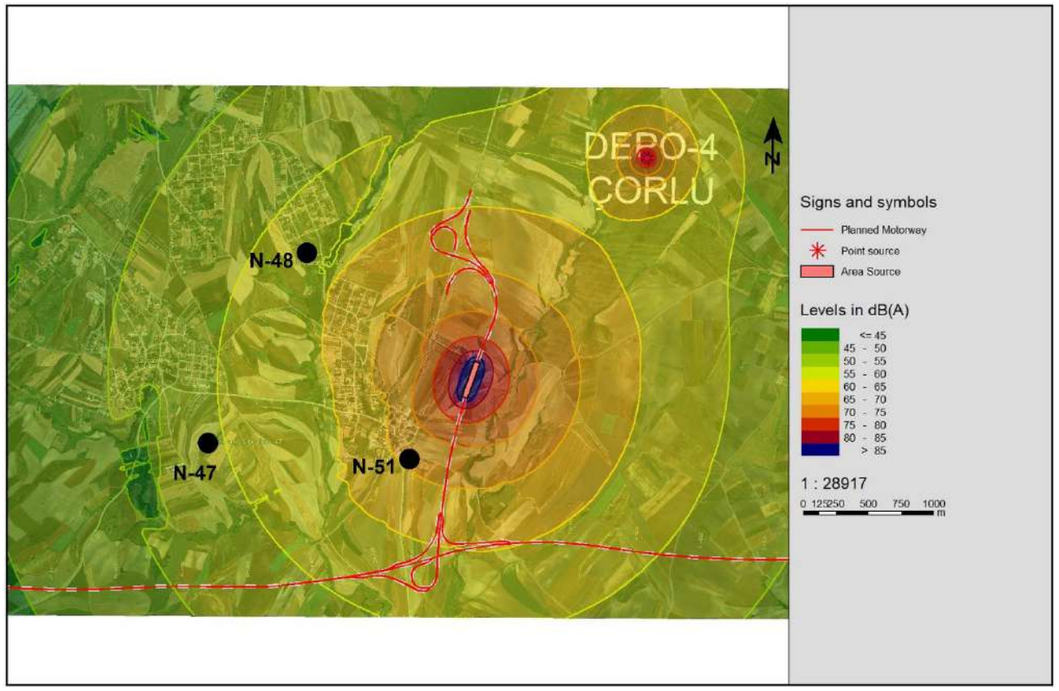

HÜSÜNLÜ
N-39
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 23698
0 125 250 500 750 1000 m

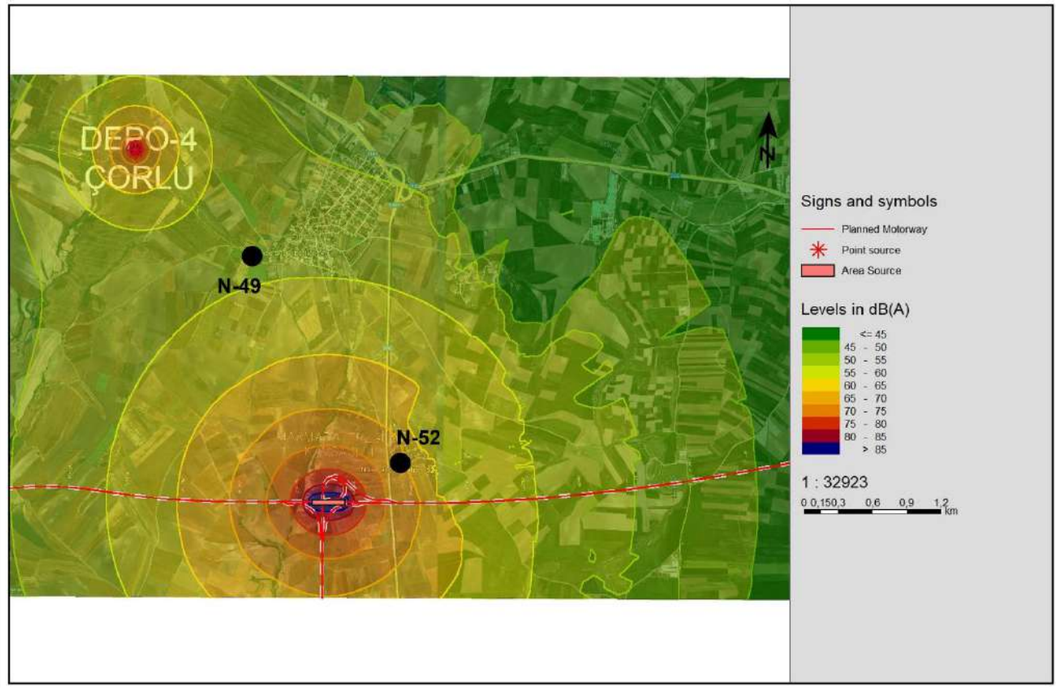

N-40
NA KAMP ALANİ
BETON SANTRALİ
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 27773
0 125250 500 750 1000 m

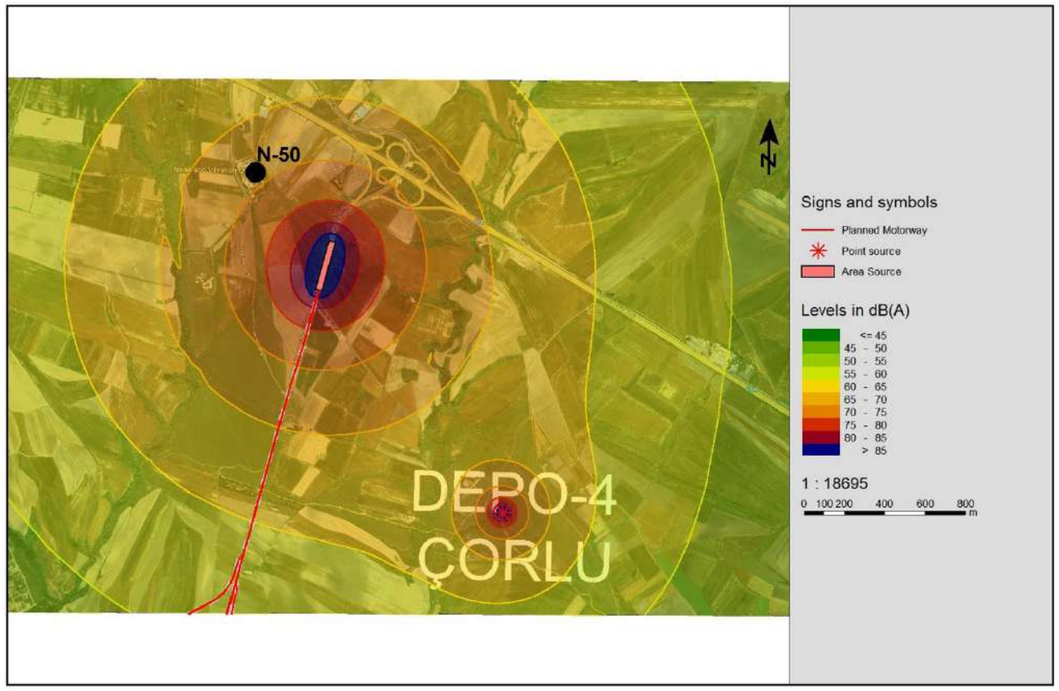

N-42
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 23984
0 125 250 500 750 1000 m

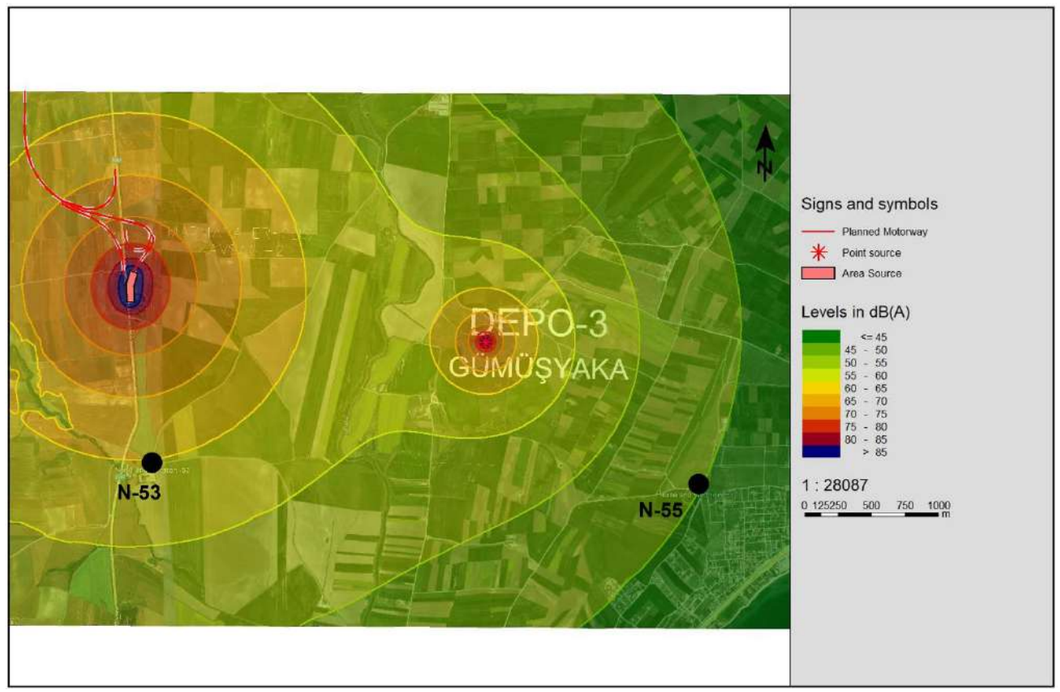

ARİYET-2
TÜRKGÜCÜ
DEPO-6
TÜRKGÜCÜ
DEPO-5
TÜRKMENLİ
N-43
N-44
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 33706
0 0,150,3 0,6 0,9 1,2 km

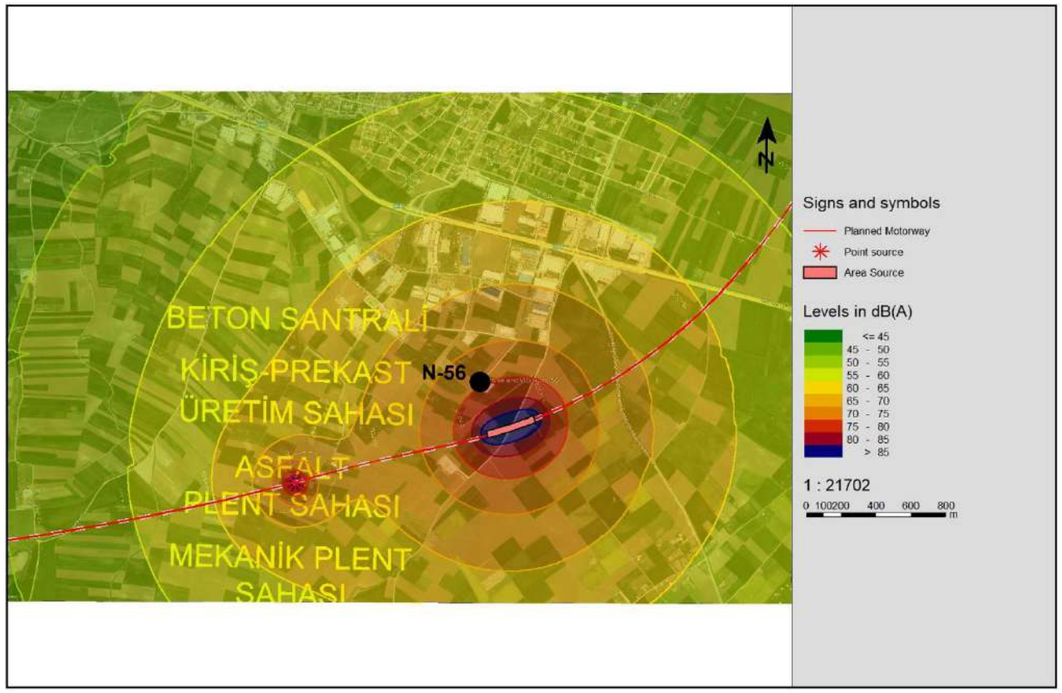

DEPO-5
TÜRKMENLİ
N-45
N-46
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85

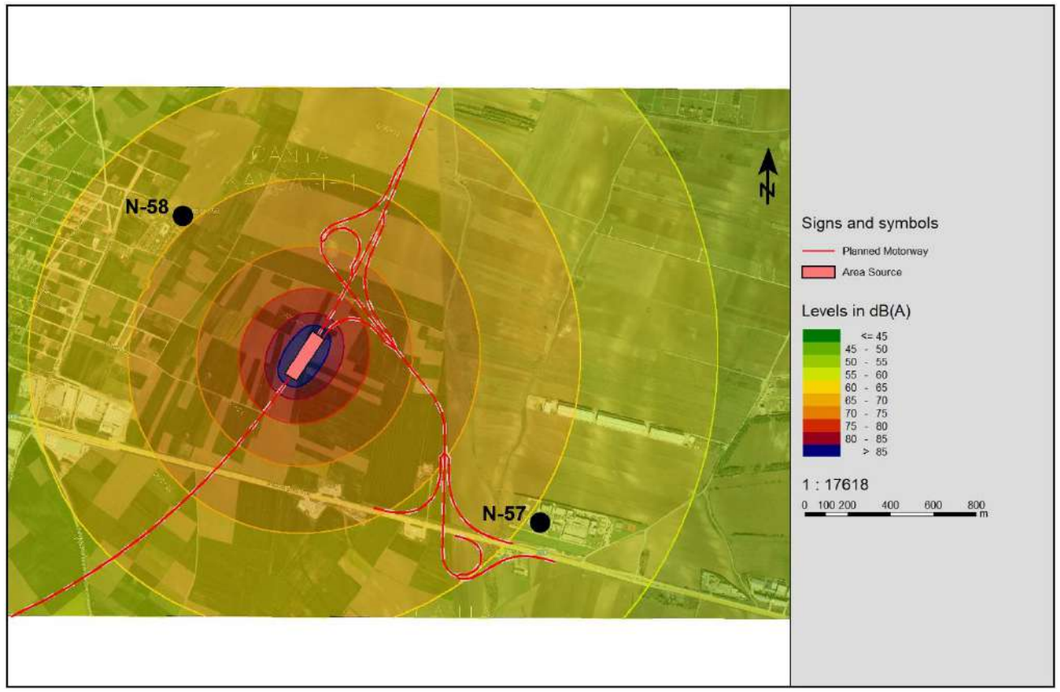

DEPO-4
ÇORLU
N-47
N-48
N-51
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 28917
0 125250 500 750 1000 m

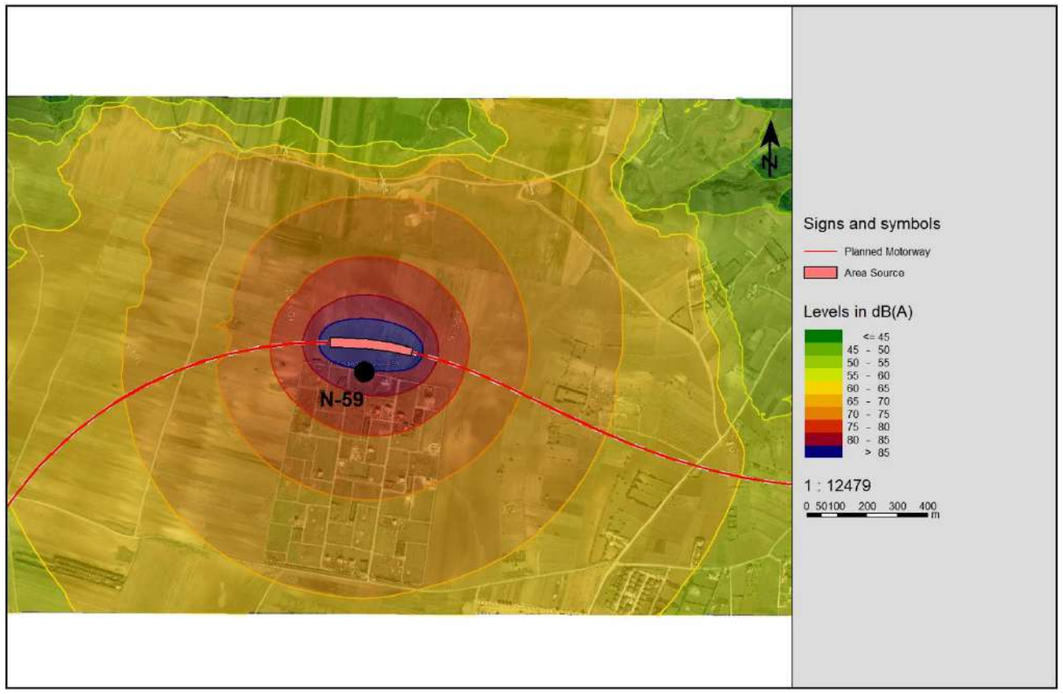

DEPO-4
ÇORLU
N-49
N-52
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 32923
0 0,150,3 0,6 0,9 1,2 km

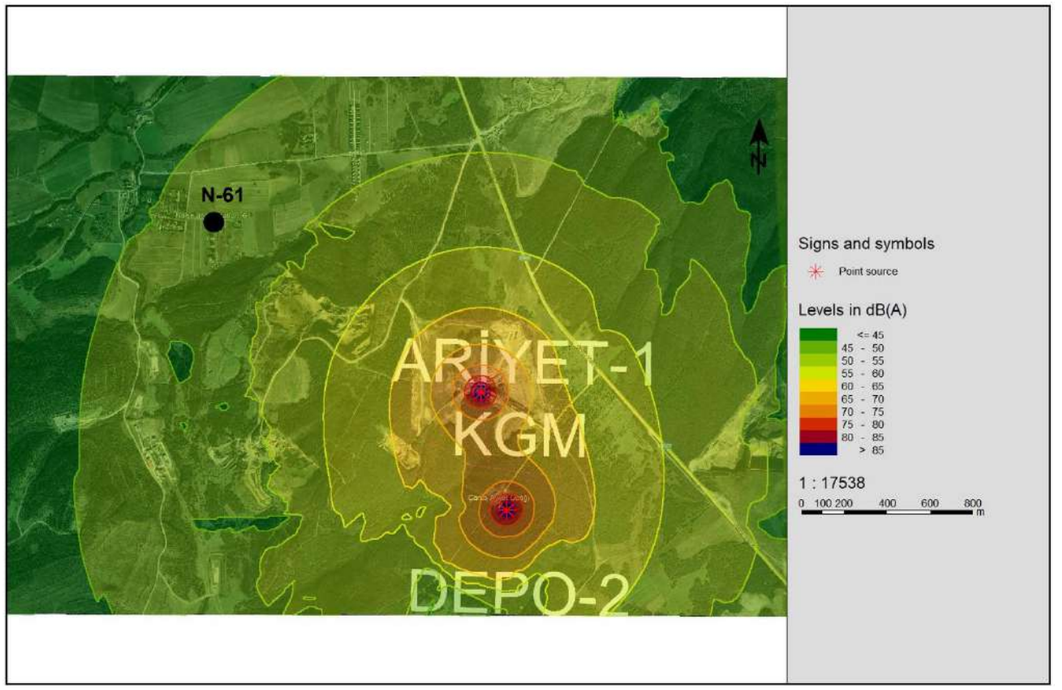

N-50
DEPO-4
ÇORLU
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 18695
0 100 200 400 600 800 m

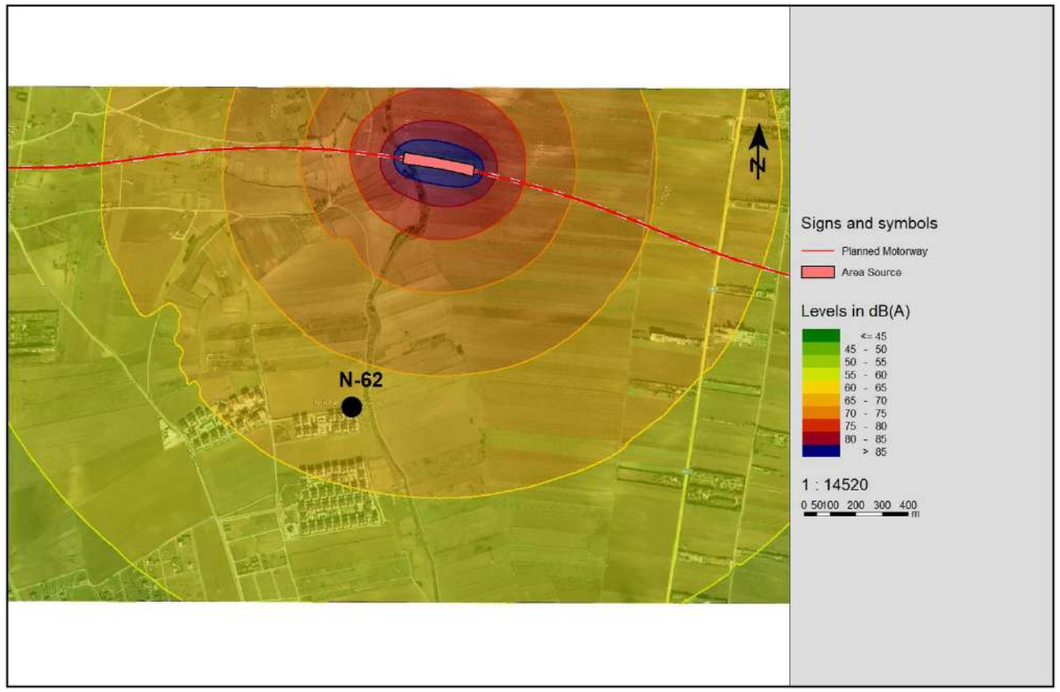

DEPO-3
GÜMÜŞYAKA
N-53
N-55
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 28087
0 125250 500 750 1000 m

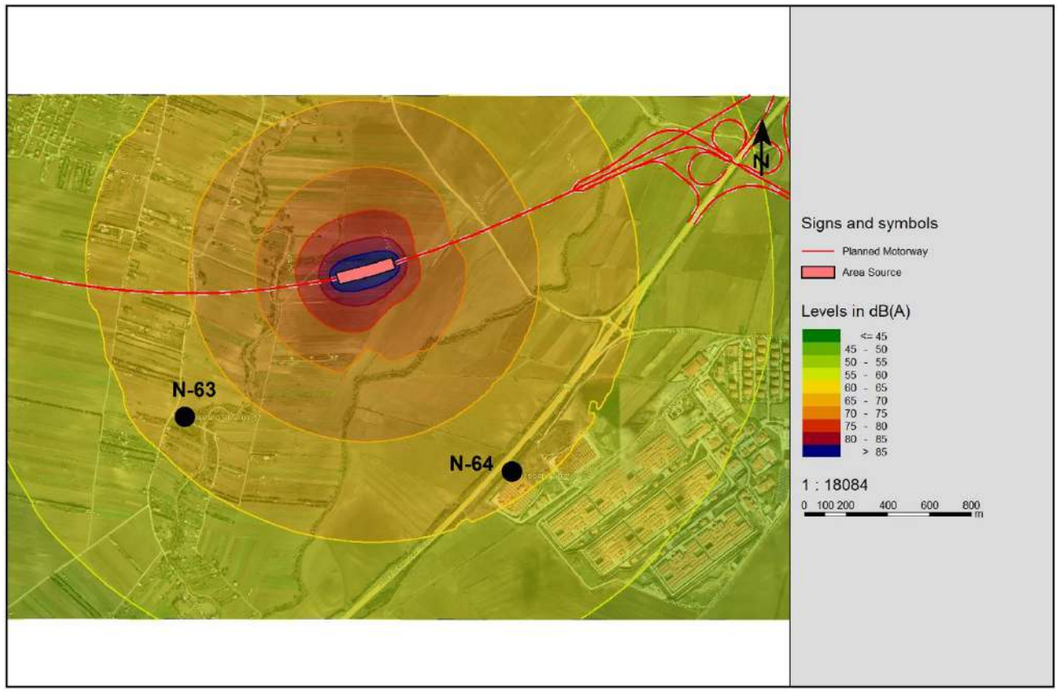

BETON SANTRALİ
KİRİŞ-PREKAST
ÜRETİM SAHASI
N-56
ASFALT
PLENT SAHASI
MEKANİK PLENT
SAHASI
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 21702
0 100200 400 600 800 m

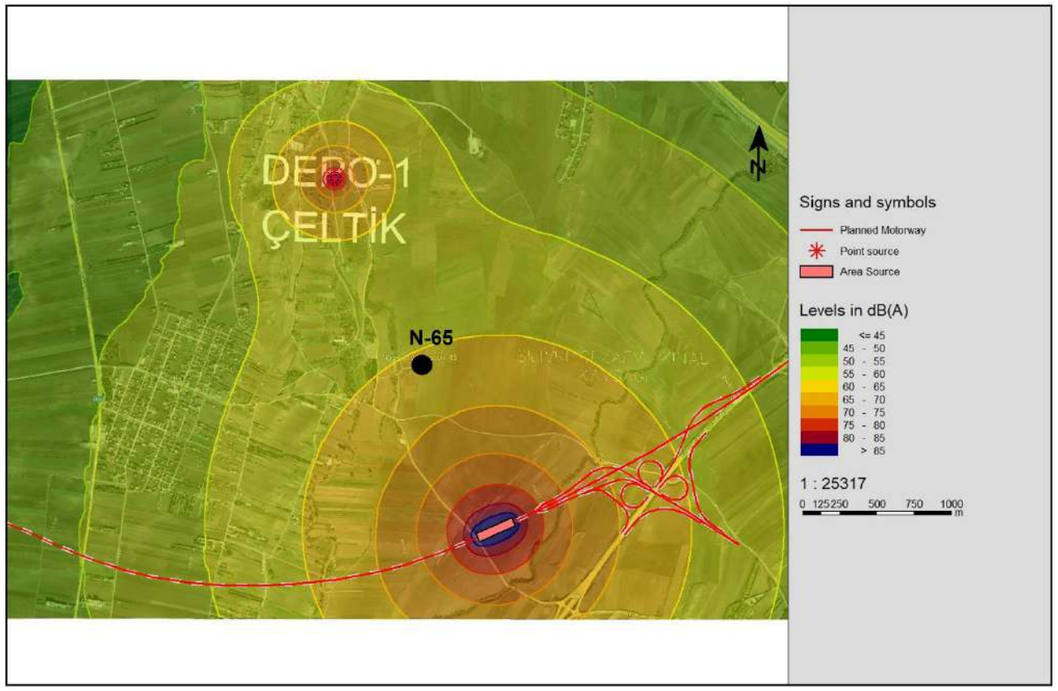

N-58
N-57
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 17618
0 100 200 400 600 800 m

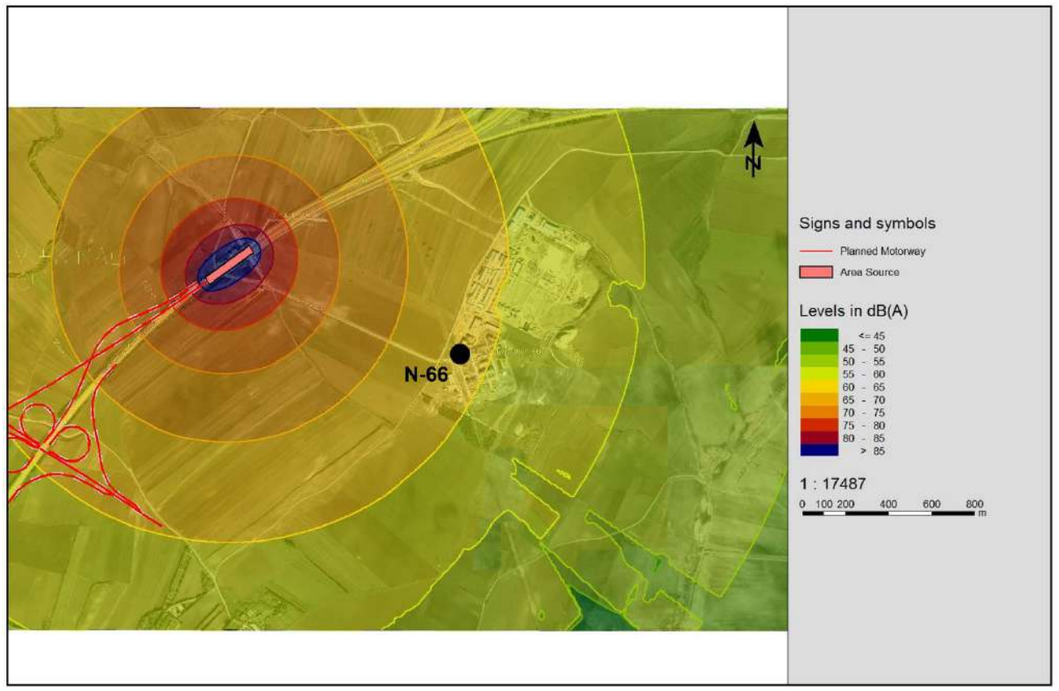

N
N-59
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 12479
0 50100 200 300 400 m

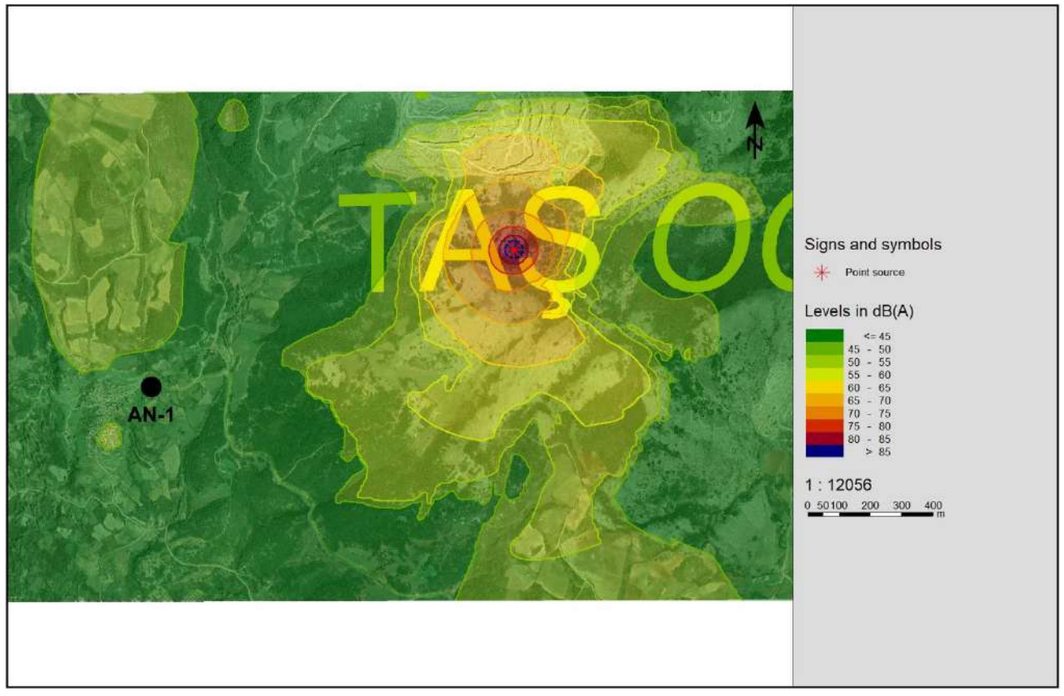

N
N-61
ARİYET-1
KGM
DEPO-2
Signs and symbols
Point source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 17538
0 100 200 400 600 800 m

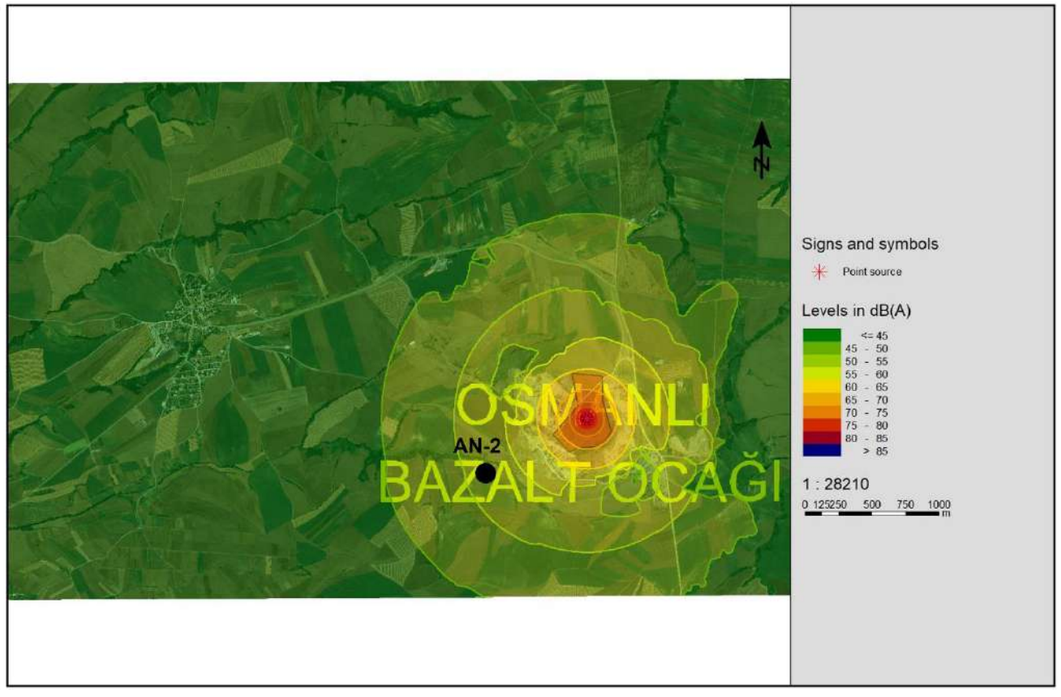

N
N-62
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14520
0 50100 200 300 400 m


N
N-63
N-64
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 18084
0 100 200 400 600 800 m


DEDO-1
ÇELTİK
N-65
N
Signs and symbols
Planned Motorway
Point source
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 25317
0 125250 500 750 1000 m


N-66
N
Signs and symbols
Planned Motorway
Area Source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 17487
0 100 200 400 600 800 m


AN-1
N
Signs and symbols
Point source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 12056
0 50100 200 300 400 m


AN-2
N
Signs and symbols
Point source
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 28210
0 125250 500 750 1000 m

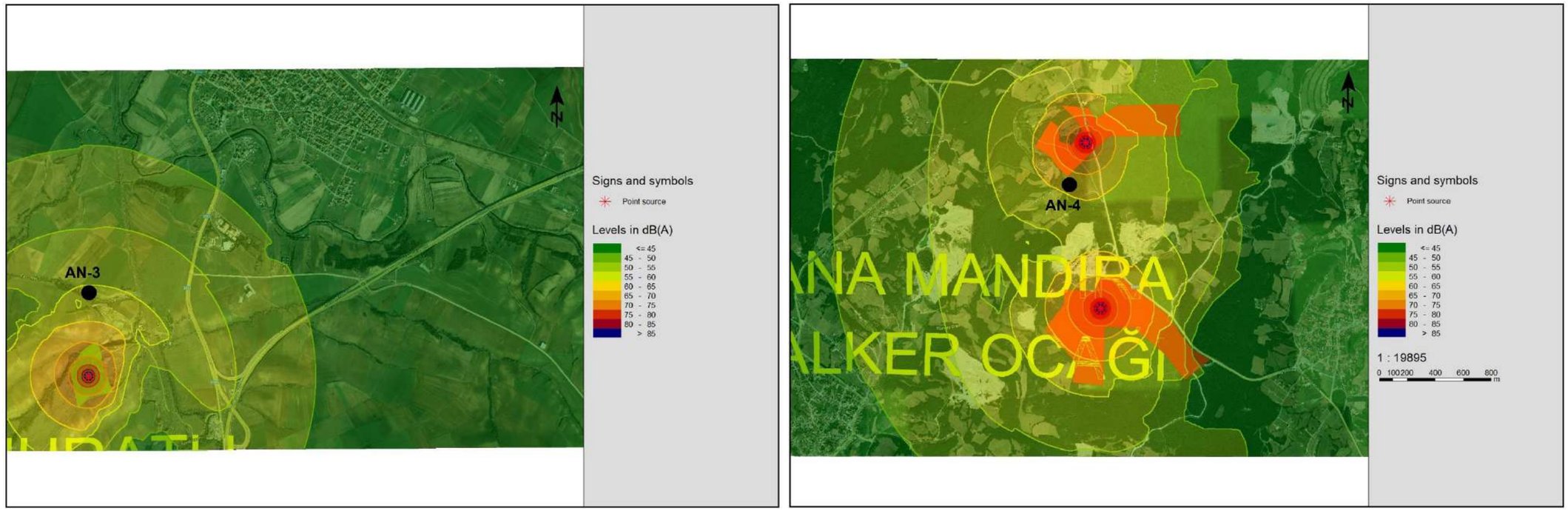



**Figure 238: Daytime Grid Noise Maps for the Construction Phase**

#### 7.1.9.3.2 Operation Phase

Potential impacts of noise during the operation phase of the Project are mainly originated from the vehicles that will pass through the motorway.

During the operation phase, impacts will be mainly associated to the following **impact factor**:

- Emission of noise

The **Project actions** related to the abovementioned impact factor is the following:

- Operation of the motorway and service facilities including the maintenance activities.

As mentioned above, noise impacts during operation phase will be mainly originated from the noise generated by the vehicles passing through the motorway. According to the traffic load projections per year provided by the Client, the types and expected numbers of vehicles using the motorway per day were calculated and are presented below.

**Table 216: Types and Expected Numbers of Vehicles Using the Motorway on Daily Basis Over Years**

| Years | Vehicle Types (vehicle/day) | | | | | |
|---|---|---|---|---|---|---|
| | Car | Truck 2-axles | Truck 3-axles | Truck 4/5-axles | Truck 6+axles | Motorcycle |
| **2025** | 5,764 | 1,005 | 274 | 2,144 | 4,568 | 42 |
| **2026** | 7,903 | 1,061 | 242 | 1,904 | 4,056 | 51 |
| **2027** | 11,247 | 1,099 | 251 | 1,979 | 4,215 | 69 |
| **2028** | 12,395 | 1,280 | 291 | 2,291 | 4,880 | 75 |
| **2029** | 15,047 | 1,339 | 303 | 2,383 | 5,077 | 91 |
| **2030** | 16,323 | 1,398 | 314 | 2,476 | 5,273 | 98 |
| **2031** | 17,599 | 1,457 | 326 | 2,568 | 5,470 | 104 |
| **2032** | 18,874 | 1,516 | 338 | 2,660 | 5,667 | 111 |
| **2033** | 20,150 | 1,575 | 350 | 2,753 | 5,864 | 118 |
| **2034** | 21,425 | 1,634 | 361 | 2,845 | 6,060 | 125 |
| **2035** | 22,135 | 1,694 | 375 | 2,949 | 6,283 | 129 |
| **2036** | 22,861 | 1,756 | 388 | 3,057 | 6,513 | 134 |
| **2037** | 23,578 | 1,821 | 403 | 3,169 | 6,751 | 138 |
| **2038** | 24,311 | 1,887 | 417 | 3,285 | 6,998 | 142 |
| **2039** | 25,035 | 1,956 | 433 | 3,406 | 7,255 | 146 |
| **2040** | 25,770 | 2,028 | 449 | 3,530 | 7,521 | 151 |

In this section, the environmental noise generated by vehicles which will pass through the motorway are evaluated cumulatively for the purpose of evaluating the worst-case scenario during the operation phase of the Project. Therefore, traffic load projections for 2040 was taken into considerations during the noise modelling studies. During the noise predictions, it is assumed that 25,770 light motor vehicles, 2,028 medium heavy vehicles, 11,500 heavy vehicles and 151 powered two-wheelers will pass through the motorway in a day.

The noise levels of the vehicles were included in the model using the standard called “CNOSSOS-EU Road: 2015”[199] which is the Common Noise Assessment Methods in the European Union that is already defined in the library of Sound Plan Essential 5.0. For model input following assumptions have been made for the noise sources:

- According to the study conducted by General Directorate of Highways[200], peak traffic hours were determined as the hours between 05:00 pm and 06:00 pm. Accordingly, number of automobiles on the traffic at the peak hours corresponds to 7.2% of the daily number of automobiles on the traffic. Likewise, number of heavy vehicles on the traffic at the peak hours corresponds to 5.4% of the daily number of heavy vehicles on the traffic. On the other hand, peak traffic hours during the night-time (10:00 pm and 07:00 am) were determined as the hours between 10:00 pm and 11:00 pm. Based on that, number of automobiles on the traffic at the night-time peak hours corresponds to 3.0% of the daily number of automobiles on the traffic. On the other hand, number of heavy vehicles on the traffic at the night-time peak hours corresponds to 4.1% of the daily number of heavy vehicles on the traffic. Based on that, in order to evaluate worst-case scenario, the peak hour traffic load was introduced to the noise model as follows:
  - During the day-time hours of 07:00 am and 10:00 pm, it was assumed that 1,855 light motor vehicles, 110 medium heavy vehicles, 621 heavy vehicles and 11 powered two-wheelers will pass through the motorway per hour.
  - During the night-time hours of 10:00 pm and 07:00 am, it was assumed that 773 light motor vehicles, 83 medium heavy vehicles, 471 heavy vehicles and 5 powered two-wheelers will pass through the motorway per hour.
- Diversion of traffic load on the motorway to motorway entrance and exit branches will vary between 25% and %50, according to the rurality & urbanity intensity of the study area.
- Traffic load on the motorway entrance and exit branches will divert to each junction on equal volumes (i.e. 25% of the traffic load on the motorway entrance and exit branches, in each junction).
- As per the Turkish Highway Traffic Law, average speeds of the light motor vehicles, medium heavy vehicles, heavy vehicles and powered two-wheelers on the motorway are taken as 140 km/hr, 100 km/hr, 90 km/hr and 100 km/hr, respectively.
- In accordance with the Project design, average speeds of the vehicles on the motorway entrance and exit branches are taken as 80 km/hr.
- In accordance with the Project design, average speeds of the vehicles on the junctions are taken as 50 km/hr.

[199] “Commission Directive 2015/996 on establishing common noise assessment methods according to Directive 2002/49/EC of the European Parliament and of the Council” (2015)

[200] Ulaştırma Bakanlığı Karayolları Genel Müdürlüğü. (2009). Devlet Yolları Trafik Akımı Özellikleri ve Trafik Parametreleri [State Roads Traffic Flow Characteristics and Traffic Parameters]

- In the modelling studies, road surface is chosen as “NL04 – SMA-NL5” in accordance with the information provided by the Client that Stone Mastic Asphalt Type II Wearing Course (30 mm) will be used.

Noise modelling studies have been performed within the determined 36 study areas for the cumulative assessment of the operation phase, where the baseline noise measurements close to the motorway route were carried out.

It should be noted that, since no industrial activity is expected to take place within the motorway facilities, operational phase noise impacts are only expected due to the vehicles passing through the motorway route.

The calculated noise levels at the receptors, where baseline noise measurements were conducted, the cumulative results and the comparison of the results with the IFC standards and Turkish limit values are presented in Table 217. Detailed breakdown of the cumulative results of the assessed receptors are given below:

- IFC day-time noise standard is complied with at 49 locations and exceeded at 7 locations out of 56, which are N11, N27, N28, N33, N34, N44 and N59;
- The predicted night-time noise levels are below the associated IFC night-time noise standard at more than half of the sensitive areas. However, the night-time noise standard is exceeded at 24 locations which are N5, N9, N11, N16, N19, N20, N26, N27, N28, N30, N31, N32, N33, N34, N37, N39, N44, N47, N51, N52, N59, N62, N64 and N65. For the locations N19 and N20, IFC night-time noise standard was already exceeded by the baseline noise levels; and difference between the cumulative results and baseline levels are below the 3 dBA threshold and therefore; the predicted noise levels are in line with the terms of the IFC guidelines.
- Turkish day-time noise regulatory limit value is complied with at all locations;
- Turkish evening-time noise regulatory limit value is complied with at almost all locations except the location N44;
- Turkish night-time noise regulatory limit value is complied with at almost all locations except the locations N11, N28, N34, N44 and N59.

The daytime grid noise maps obtained for the operation phase are presented in the Figure 239.

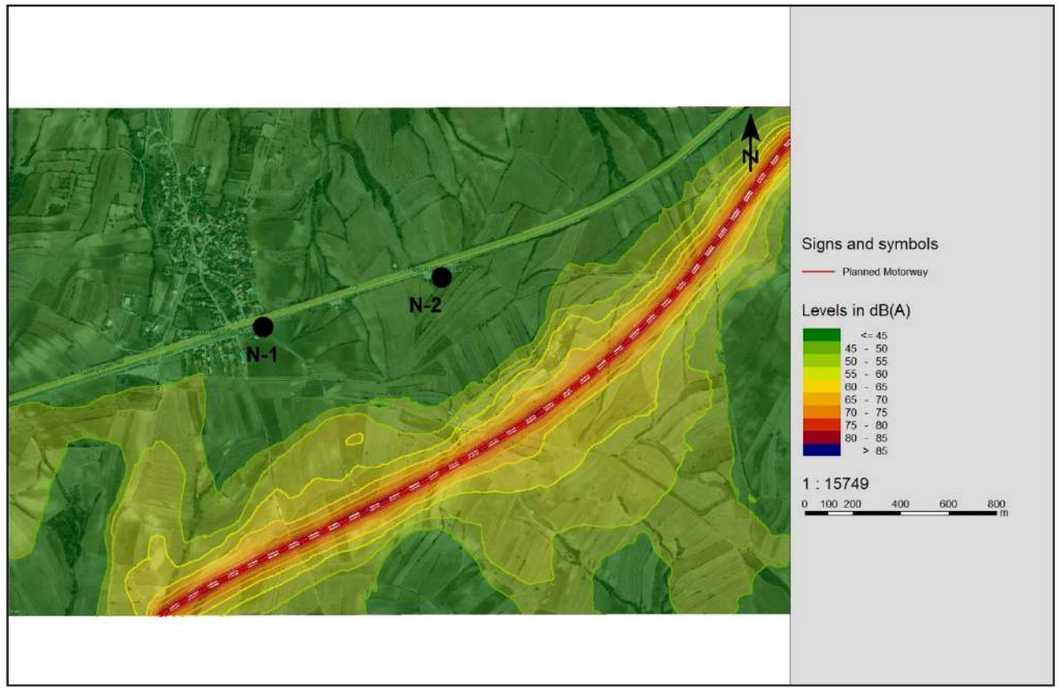
**Table 217: Modelled Operational Noise Levels and Baseline Noise Levels at the Receptors**

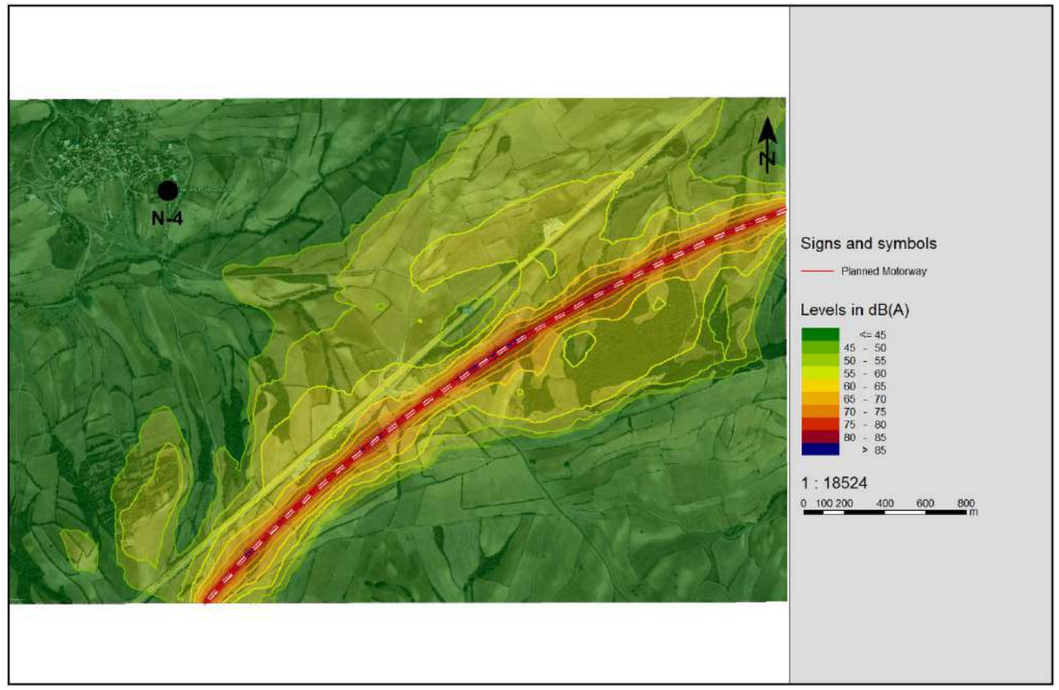
| Measurement Point* | Measurement Location | | | | | Modelled Noise Level (originated from Project activities) (dBA) | | | | | Baseline Noise Levels (dBA)*** | | | | | Modelled Noise Level + The Ambient Noise Level (dBA) | | | | | Difference between ambient and modelled sound levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Province | District | Village / Neighbourhood | Receptor Type** | Distance to Motorway (m) | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | | | | | | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N1 | Tekirdağ | Malkara | Ahievren | R | 850 | 32.4 | 30.7 | 32.4 | 32.4 | 30.7 | 48.7 | 44.0 | 49.5 | 45.5 | 43.9 | 48.8 | 44.2 | 49.6 | 45.7 | 44.1 | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 |
| N2 | Tekirdağ | Malkara | Ahievren | C | 680 | 27.4 | 25.6 | 27.4 | 27.4 | 25.6 | 47.6 | 40.6 | 49.0 | 42.5 | 40.0 | 47.6 | 40.7 | 49.0 | 42.6 | 40.2 | 0.0 | 0.1 | 0.0 | 0.1 | 0.2 |
| N4 | Tekirdağ | Malkara | Hereke | R | 1,560 | 42.9 | 40.8 | 42.9 | 42.9 | 40.8 | 49.3 | 41.3 | 50.4 | 43.6 | 40.1 | 50.2 | 44.1 | 51.1 | 46.3 | 43.5 | 0.9 | 2.8 | 0.7 | 2.7 | 3.4 |
| N5 | Tekirdağ | Malkara | Yenice | R | 600 | 47.4 | 45.1 | 47.4 | 47.4 | 45.1 | 50.5 | 43.4 | 51.3 | 46.6 | 42.7 | 52.2 | 47.3 | 52.8 | 50.0 | 47.1 | 1.7 | 3.9 | 1.5 | 3.4 | 4.4 |
| N6 | Tekirdağ | Malkara | Dereköy | R | 1,300 | 24.9 | 22.8 | 24.9 | 24.9 | 22.8 | 47.5 | 40.9 | 48.8 | 41.2 | 41.1 | 47.5 | 41.0 | 48.8 | 41.3 | 41.2 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| N7 | Tekirdağ | Süleymanpaşa | Kınıklar | R | 1,150 | 41.9 | 39.8 | 41.9 | 41.9 | 39.8 | 52.4 | 42.7 | 54.9 | 42.4 | 42.7 | 52.8 | 44.5 | 55.1 | 45.2 | 44.5 | 0.4 | 1.8 | 0.2 | 2.8 | 1.8 |
| N8 | Tekirdağ | Süleymanpaşa | Akçahalil | R | 1,500 | 36.7 | 34.8 | 36.7 | 36.7 | 34.8 | 47.3 | 39.0 | 48.7 | 42.6 | 38.7 | 47.7 | 40.4 | 49.0 | 43.6 | 40.2 | 0.4 | 1.4 | 0.3 | 1.0 | 1.5 |
| N9 | Tekirdağ | Süleymanpaşa | Akçahalil | R | 520 | 52.1 | 50.1 | 52.1 | 52.1 | 50.1 | 47.4 | 39.7 | 49.1 | 41.8 | 39.5 | 53.4 | 50.5 | 53.9 | 52.5 | 50.5 | 6.0 | 10.8 | 4.8 | 10.7 | 11.0 |
| N10 | Tekirdağ | Süleymanpaşa | Otmanlı | C | 980 | 38.9 | 37.0 | 38.9 | 38.9 | 37.0 | 51.1 | 44.5 | 52.2 | 46.0 | 41.7 | 51.4 | 45.2 | 52.4 | 46.8 | 43.0 | 0.3 | 0.7 | 0.2 | 0.8 | 1.3 |
| N11 | Tekirdağ | Süleymanpaşa | İnecik | R | 165 | 57.7 | 55.8 | 57.7 | 57.7 | 55.8 | 48.8 | 43.9 | 49.9 | 45.4 | 43.9 | 58.2 | 56.1 | 58.4 | 57.9 | 56.1 | 9.4 | 12.2 | 8.5 | 12.5 | 12.2 |
| N12 | Tekirdağ | Süleymanpaşa | İnecik | R | 1,250 | 44.0 | 41.8 | 44.0 | 44.0 | 41.8 | 51.4 | 42.2 | 54.4 | 41.4 | 42.2 | 52.1 | 45.0 | 54.8 | 45.9 | 45.0 | 0.7 | 2.8 | 0.4 | 4.5 | 2.8 |
| N13 | Tekirdağ | Süleymanpaşa | İnecik | C | 260 | 51.6 | 49.7 | 51.6 | 51.6 | 49.7 | 49.4 | 42.4 | 50.5 | 44.1 | 42.7 | 53.6 | 50.4 | 54.1 | 52.3 | 50.5 | 4.2 | 8.0 | 3.6 | 8.2 | 7.8 |
| N14 | Tekirdağ | Süleymanpaşa | Nusratfakı | C | 700 | 51.1 | 48.9 | 51.1 | 51.1 | 48.9 | 48.7 | 40.7 | 48.7 | 47.1 | 40.7 | 53.1 | 49.5 | 53.1 | 52.6 | 49.5 | 4.4 | 8.8 | 4.4 | 5.5 | 8.8 |
| N15 | Tekirdağ | Süleymanpaşa | Nusratfakı | R | 460 | 42.1 | 40.3 | 42.1 | 42.1 | 40.3 | 49.1 | 41.2 | 51.1 | 42.6 | 40.9 | 49.9 | 43.8 | 51.6 | 45.4 | 43.6 | 0.8 | 2.6 | 0.5 | 2.8 | 2.7 |
| N16 | Tekirdağ | Süleymanpaşa | Güvençli | R | 520 | 51.5 | 49.5 | 51.5 | 51.5 | 49.5 | 48.2 | 41.5 | 49.6 | 44.0 | 41.6 | 53.2 | 50.1 | 53.7 | 52.2 | 50.2 | 5.0 | 8.6 | 4.1 | 8.2 | 8.6 |
| N19 | Tekirdağ | Süleymanpaşa | Seymenli | R | 840 | 43.8 | 42.0 | 43.8 | 43.8 | 42.0 | 53.2 | 45.7 | 55.4 | 53.0 | 44.6 | 53.7 | 47.2 | 55.7 | 53.5 | 46.5 | 0.5 | 1.5 | 0.3 | 0.5 | 1.9 |
| N20 | Tekirdağ | Süleymanpaşa | Karahisarlı | R | 1,500 | 30.0 | 28.5 | 30.0 | 30.0 | 28.5 | 48.1 | 46.5 | 50.1 | 45.8 | 46.3 | 48.2 | 46.6 | 50.1 | 45.9 | 46.4 | 0.1 | 0.1 | 0.0 | 0.1 | 0.1 |
| N23 | Tekirdağ | Süleymanpaşa | Yağcı | R | 1,450 | 37.5 | 35.4 | 37.5 | 37.5 | 35.4 | 49.6 | 43.5 | 50.8 | 46.1 | 43.5 | 49.9 | 44.1 | 51.0 | 46.7 | 44.1 | 0.3 | 0.6 | 0.2 | 0.6 | 0.6 |
| N24 | Tekirdağ | Süleymanpaşa | Karadeniz | R | 330 | 31.6 | 30.1 | 31.6 | 31.6 | 30.1 | 49.8 | 43.6 | 50.7 | 46.0 | 43.6 | 49.9 | 43.8 | 50.8 | 46.2 | 43.8 | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 |
| N25 | Tekirdağ | Süleymanpaşa | Yağcı | C | 1,000 | 29.1 | 27.5 | 29.1 | 29.1 | 27.5 | 46.8 | 42.0 | 48.0 | 44.5 | 41.3 | 46.9 | 42.2 | 48.1 | 44.6 | 41.5 | 0.1 | 0.2 | 0.1 | 0.1 | 0.2 |
| N26 | Tekirdağ | Süleymanpaşa | Kayı | R | 270 | 49.5 | 47.8 | 49.5 | 49.5 | 47.8 | 48.2 | 41.2 | 50.2 | 40.6 | 41.3 | 51.9 | 48.7 | 52.9 | 50.0 | 48.7 | 3.7 | 7.5 | 2.7 | 9.4 | 7.4 |
| N27 | Tekirdağ | Süleymanpaşa | Kayı | R | 190 | 54.1 | 52.5 | 54.1 | 54.1 | 52.5 | 50.0 | 42.0 | 51.1 | 44.5 | 41.6 | 55.5 | 52.9 | 55.9 | 54.6 | 52.8 | 5.5 | 10.9 | 4.8 | 10.1 | 11.2 |
| N28 | Tekirdağ | Süleymanpaşa | Kayı | R | 110 | 59.2 | 57.4 | 59.2 | 59.2 | 57.4 | 48.1 | 40.1 | 50.2 | 41.5 | 39.5 | 59.5 | 57.5 | 59.7 | 59.3 | 57.5 | 11.4 | 17.4 | 9.5 | 17.8 | 18.0 |
| N29 | Tekirdağ | Süleymanpaşa | İstiklal | R | 450 | 41.3 | 39.6 | 41.3 | 41.3 | 39.6 | 49.9 | 41.2 | 51.0 | 44.5 | 41.4 | 50.5 | 43.5 | 51.4 | 46.2 | 43.6 | 0.6 | 2.3 | 0.4 | 1.7 | 2.2 |
| N30 | Tekirdağ | Süleymanpaşa | Kayı | R | 600 | 49.3 | 47.2 | 49.3 | 49.3 | 47.2 | 50.4 | 42.2 | 52.7 | 41.6 | 42.6 | 52.9 | 48.4 | 54.3 | 50.0 | 48.5 | 2.5 | 6.2 | 1.6 | 8.4 | 5.9 |
| N31 | Tekirdağ | Süleymanpaşa | Kayı | R | 660 | 48.9 | 46.9 | 48.9 | 48.9 | 46.9 | 49.8 | 41.6 | 51.4 | 43.0 | 41.8 | 52.4 | 48.0 | 53.3 | 49.9 | 48.1 | 2.6 | 6.4 | 1.9 | 6.9 | 6.3 |
| N32 | Tekirdağ | Süleymanpaşa | Köseilyas | R | 250 | 51.1 | 49.6 | 51.1 | 51.1 | 49.6 | 51.2 | 42.4 | 52.5 | 45.1 | 42.0 | 54.2 | 50.4 | 54.9 | 52.1 | 50.3 | 3.0 | 8.0 | 2.4 | 7.0 | 8.3 |
| N33 | Tekirdağ | Süleymanpaşa | Köseilyas | R | 220 | 54.4 | 52.6 | 54.4 | 54.4 | 52.6 | 48.7 | 42.1 | 50.7 | 43.8 | 41.7 | 55.4 | 53.0 | 55.9 | 54.8 | 52.9 | 6.7 | 10.9 | 5.2 | 11.0 | 11.2 |
| N34 | Tekirdağ | Süleymanpaşa | Köseilyas | R | 150 | 57.4 | 55.6 | 57.4 | 57.4 | 55.6 | 50.2 | 43.1 | 51.2 | 45.1 | 43.2 | 58.2 | 55.8 | 58.3 | 57.6 | 55.8 | 8.0 | 12.7 | 7.1 | 12.5 | 12.6 |

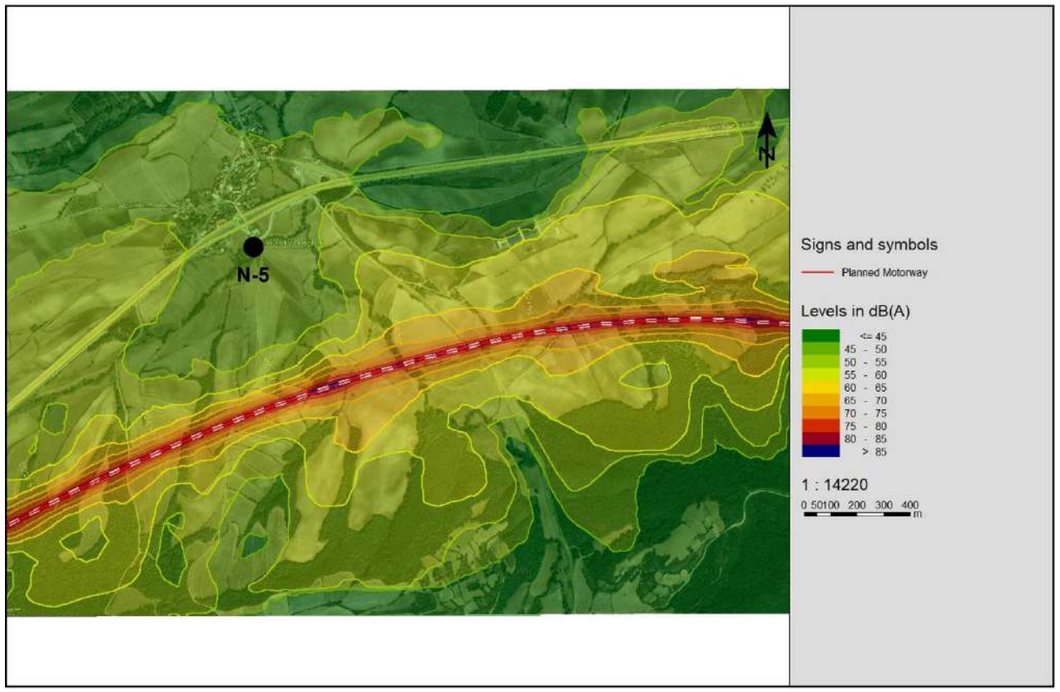
| Measurement Point* | Measurement Location | | | | | Modelled Noise Level (originated from Project activities) (dBA) | | | | | Baseline Noise Levels (dBA)*** | | | | | Modelled Noise Level + The Ambient Noise Level (dBA) | | | | | Difference between ambient and modelled sound levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Province | District | Village / Neighbourhood | Receptor Type** | Distance to Motorway (m) | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | | | | | | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N35 | Tekirdağ | Süleymanpaşa | Köseilyas | C | 2,100 | 28.5 | 26.9 | 28.5 | 28.5 | 26.9 | 49.9 | 42.3 | 50.0 | 43.7 | 42.3 | 49.9 | 42.4 | 50.0 | 43.8 | 42.4 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| N36 | Tekirdağ | Süleymanpaşa | Köseilyas | R | 1,000 | 35.7 | 34.1 | 35.7 | 35.7 | 34.1 | 50.4 | 42.1 | 52.6 | 42.0 | 42.5 | 50.5 | 42.7 | 52.7 | 42.9 | 43.1 | 0.1 | 0.6 | 0.1 | 0.9 | 0.6 |
| N37 | Tekirdağ | Süleymanpaşa | Bahçelievler | R | 50 | 50.9 | 49.3 | 50.9 | 50.9 | 49.3 | 49.0 | 40.3 | 50.0 | 43.4 | 40.0 | 53.1 | 49.8 | 53.5 | 51.6 | 49.8 | 4.1 | 9.5 | 3.5 | 8.2 | 9.8 |
| N38 | Tekirdağ | Süleymanpaşa | Gazioğlu | R | 960 | 41.0 | 39.1 | 41.0 | 41.0 | 39.1 | 49.0 | 40.9 | 51.1 | 45.3 | 40.8 | 49.6 | 43.1 | 51.5 | 46.7 | 43.0 | 0.6 | 2.2 | 0.4 | 1.4 | 2.2 |
| N39 | Tekirdağ | Süleymanpaşa | Husunlu | R | 560 | 46.5 | 44.3 | 46.5 | 46.5 | 44.3 | 49.6 | 43.1 | 51.2 | 46.1 | 42.7 | 51.3 | 46.8 | 52.5 | 49.3 | 46.6 | 1.7 | 3.7 | 1.3 | 3.2 | 3.9 |
| N40 | Tekirdağ | Süleymanpaşa | Karaevli | R | 900 | 34.9 | 33.1 | 34.9 | 34.9 | 33.1 | 49.0 | 42.5 | 51.1 | 47.0 | 42.5 | 49.2 | 43.0 | 51.2 | 47.3 | 43.0 | 0.2 | 0.5 | 0.1 | 0.3 | 0.5 |
| N42 | Tekirdağ | Çorlu | Yenice | R | 660 | 22.4 | 20.9 | 22.4 | 22.4 | 20.9 | 51.6 | 42.7 | 52.8 | 45.4 | 42.3 | 51.6 | 42.7 | 52.8 | 45.4 | 42.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| N43 | Tekirdağ | Çorlu | Türkgücü | R | 2,150 | 26.3 | 24.6 | 26.3 | 26.3 | 24.6 | 50.1 | 42.0 | 51.4 | 44.1 | 41.6 | 50.1 | 42.1 | 51.4 | 44.2 | 41.7 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| N44 | Tekirdağ | Marmaraereğlisi | Çeşmeli | R | 60 | 60.7 | 58.4 | 60.7 | 60.7 | 58.4 | 48.8 | 42.5 | 51.1 | 41.5 | 42.9 | 61.0 | 58.5 | 61.2 | 60.8 | 58.5 | 12.2 | 16.0 | 10.1 | 19.3 | 15.6 |
| N45 | Tekirdağ | Marmaraereğlisi | Çeşmeli | R | 2,400 | 28.4 | 26.6 | 28.4 | 28.4 | 26.6 | 50.2 | 42.5 | 53.0 | 44.0 | 41.6 | 50.2 | 42.6 | 53.0 | 44.1 | 41.7 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| N46 | Tekirdağ | Marmaraereğlisi | Türkmenli | R | 2,700 | 19.8 | 18.0 | 19.8 | 19.8 | 18.0 | 47.2 | 41.1 | 49.5 | 39.7 | 42.0 | 47.2 | 41.1 | 49.5 | 39.7 | 42.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| N47 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | 1,050 | 49.7 | 47.7 | 49.7 | 49.7 | 47.7 | 50.4 | 42.6 | 53.1 | 40.5 | 42.6 | 53.1 | 48.9 | 54.7 | 50.2 | 48.9 | 2.7 | 6.3 | 1.6 | 9.7 | 6.3 |
| N48 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | 1,080 | 35.9 | 34.1 | 35.9 | 35.9 | 34.1 | 51.7 | 42.4 | 54.5 | 42.4 | 42.5 | 51.8 | 43.0 | 54.6 | 43.3 | 43.1 | 0.1 | 0.6 | 0.1 | 0.9 | 0.6 |
| N49 | Tekirdağ | Çorlu | Seymen | R | 2,100 | 28.0 | 26.0 | 28.0 | 28.0 | 26.0 | 52.0 | 43.9 | 53.7 | 44.2 | 44.5 | 52.0 | 44.0 | 53.7 | 44.3 | 44.6 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| N50 | Tekirdağ | Çorlu | Seymen | R | 500 | 27.8 | 26.2 | 27.8 | 27.8 | 26.2 | 49.4 | 43.6 | 50.0 | 46.3 | 43.5 | 49.4 | 43.7 | 50.0 | 46.4 | 43.6 | 0.0 | 0.1 | 0.0 | 0.1 | 0.1 |
| N51 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | 280 | 47.2 | 45.3 | 47.2 | 47.2 | 45.3 | 50.0 | 42.5 | 50.9 | 46.1 | 42.4 | 51.8 | 47.1 | 52.4 | 49.7 | 47.1 | 1.8 | 4.6 | 1.5 | 3.6 | 4.7 |
| N52 | Tekirdağ | Çorlu | Seymen | R | 330 | 45.5 | 43.7 | 45.5 | 45.5 | 43.7 | 48.3 | 42.1 | 48.6 | 43.2 | 42.3 | 50.1 | 46.0 | 50.3 | 47.5 | 46.1 | 1.8 | 3.9 | 1.7 | 4.3 | 3.8 |
| N53 | Tekirdağ | Marmaraereğlisi | Sultanköy | R | 1,220 | 21.4 | 18.2 | 21.4 | 21.4 | 18.2 | 46.4 | 40.4 | 47.1 | 42.0 | 40.6 | 46.4 | 40.4 | 47.1 | 42.0 | 40.6 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| N56 | İstanbul | Silivri | Fevzipaşa | C | 260 | 49.1 | 47.2 | 49.1 | 49.1 | 47.2 | 51.2 | 44.0 | 51.8 | 48.2 | 43.6 | 53.3 | 48.9 | 53.7 | 51.7 | 48.8 | 2.1 | 4.9 | 1.9 | 3.5 | 5.2 |
| N57 | İstanbul | Silivri | Balaban | C | 140 | 47.7 | 46.1 | 47.7 | 47.7 | 46.1 | 47.8 | 41.8 | 49.6 | 41.4 | 42.2 | 50.8 | 47.5 | 51.8 | 48.6 | 47.6 | 3.0 | 5.7 | 2.2 | 7.2 | 5.4 |
| N58 | İstanbul | Silivri | İsmetpaşa | R | 650 | 35.8 | 34.1 | 35.8 | 35.8 | 34.1 | 47.7 | 42.1 | 49.6 | 44.8 | 42.0 | 48.0 | 42.7 | 49.8 | 45.3 | 42.7 | 0.3 | 0.6 | 0.2 | 0.5 | 0.7 |
| N59 | İstanbul | Silivri | Balaban | R | 90 | 59.1 | 56.9 | 59.1 | 59.1 | 56.9 | 49.8 | 41.0 | 48.6 | 43.2 | 40.6 | 59.6 | 57.0 | 59.5 | 59.2 | 57.0 | 9.8 | 16.0 | 10.9 | 16.0 | 16.4 |
| N62 | İstanbul | Silivri | Sancaktepe | R | 1,000 | 44.0 | 42.0 | 44.0 | 44.0 | 42.0 | 51.0 | 42.8 | 51.8 | 47.2 | 41.9 | 51.8 | 45.4 | 52.5 | 48.9 | 45.0 | 0.8 | 2.6 | 0.7 | 1.7 | 3.1 |
| N63 | İstanbul | Silivri | Çeltik | R | 600 | 41.1 | 39.3 | 41.1 | 41.1 | 39.3 | 48.1 | 41.0 | 48.0 | 43.9 | 40.8 | 48.9 | 43.2 | 48.8 | 45.7 | 43.1 | 0.8 | 2.2 | 0.8 | 1.8 | 2.3 |
| N64 | İstanbul | Silivri | Semizkumlar | R | 1,160 | 45.5 | 43.5 | 45.5 | 45.5 | 43.5 | 53.3 | 44.0 | 52.5 | 43.8 | 45.0 | 54.0 | 46.8 | 53.3 | 47.7 | 47.3 | 0.7 | 2.8 | 0.8 | 3.9 | 2.3 |
| N65 | İstanbul | Silivri | Yolcatı | R | 1,200 | 39.2 | 37.5 | 39.2 | 39.2 | 37.5 | 51.7 | 44.8 | 52.3 | 47.4 | 44.2 | 51.9 | 45.5 | 52.5 | 48.0 | 45.0 | 0.2 | 0.7 | 0.2 | 0.6 | 0.8 |

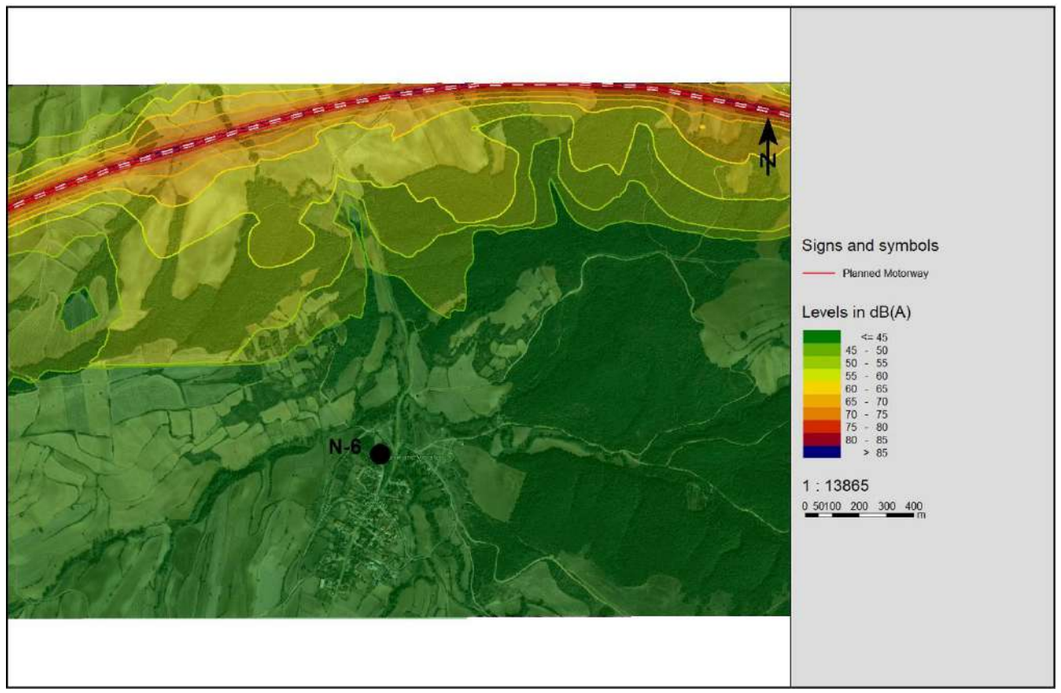
| Measurement Point* | Measurement Location | | | | | Modelled Noise Level (originated from Project activities) (dBA) | | | | | Baseline Noise Levels (dBA)*** | | | | | Modelled Noise Level + The Ambient Noise Level (dBA) | | | | | Difference between ambient and modelled sound levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Province | District | Village / Neighbourhood | Receptor Type** | Distance to Motorway (m) | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | | | | | | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N66 | İstanbul | Silivri | Alipaşa | C | 1,110 | 33.0 | 31.0 | 33.0 | 33.0 | 31.0 | 48.1 | 42.5 | 48.6 | 45.4 | 41.7 | 48.2 | 42.8 | 48.7 | 45.6 | 42.1 | 0.1 | 0.3 | 0.1 | 0.2 | 0.4 |
| IFC Noise Standards[1,2] | Industrial; commercial areas | | | | | **70** | **70** | - | - | - | **70** | **70** | - | - | - | **70** | **70** | - | - | - | **3** | **3** | - | - | - |
| | Residential; institutional; educational areas | | | | | **55** | **45** | - | - | - | **55** | **45** | - | - | - | **55** | **45** | - | - | - | **3** | **3** | - | - | - |
| Turkish Noise Limit Values[3,4] | Industrial facilities, transportation sources | | | | | - | - | **65** | **60** | **55** | - | - | **65** | **60** | **55** | - | - | **65** | **60** | **55** | - | - | - | - | - |

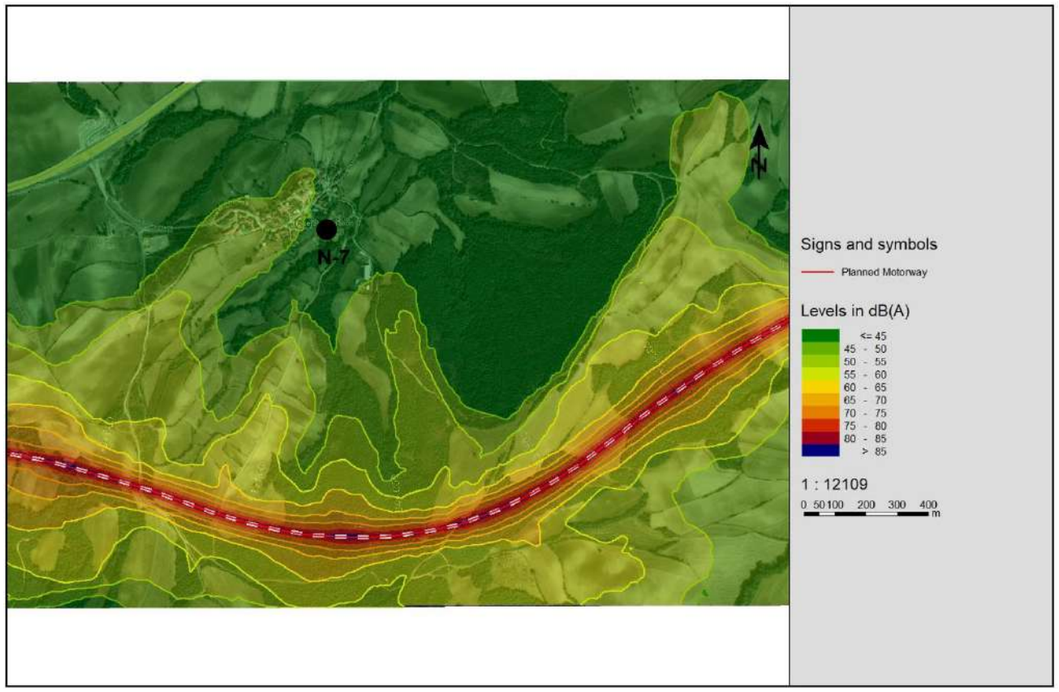
**Notes:**
* 10 noise measurement locations (N3, N17, N18, N21, N22, N41, N54, N55, N60 and N61) were scoped out during the modelling studies due to the changes in the Project Layout.
*** Residential (R) or Commercial (C)*
*** For the worst-case scenario simulation, modelled noise levels were cumulatively assessed by considering the highest baseline noise levels measured.
[1] IFC Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: Environmental - Noise Management;
[2] IFC Guidelines provide noise standards for two-time intervals in 24 hours: day (07:00 to 22:00), and night (22:00 to 07:00).
[3] Regulation on Control of Environmental Noise;
[4] Regulation on Control of Environmental Noise provides noise standards for three-time intervals in 24 hours: day (07:00 to 19:00), evening (19:00 to 23:00) and night (23:00 to 07:00).

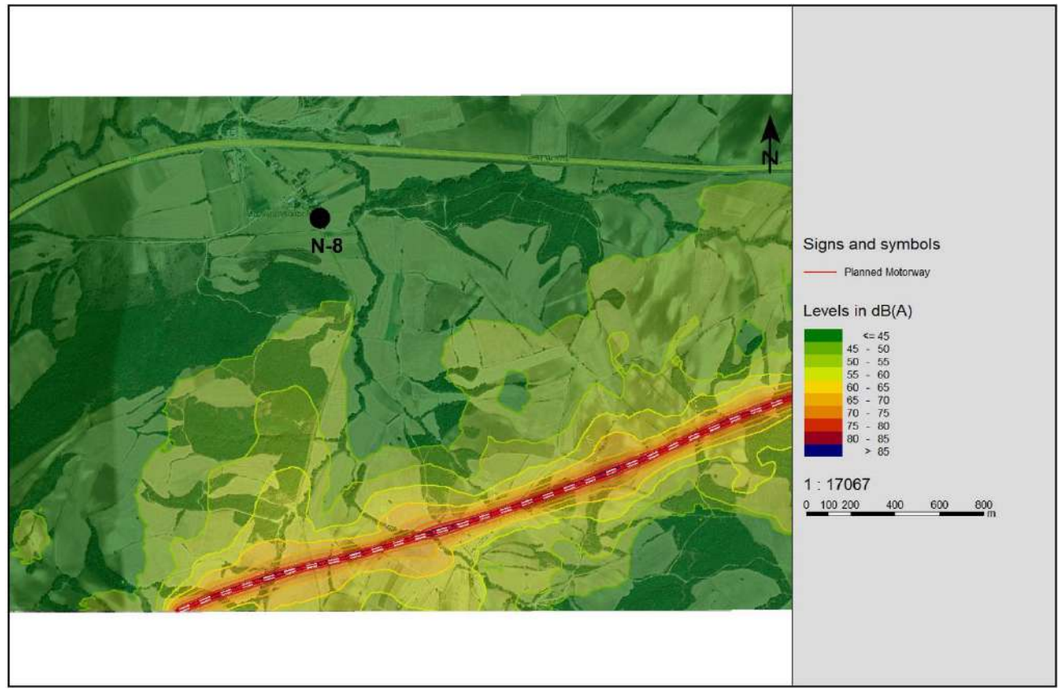

N-1
N-2
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 15749
0 100 200 400 600 800 m

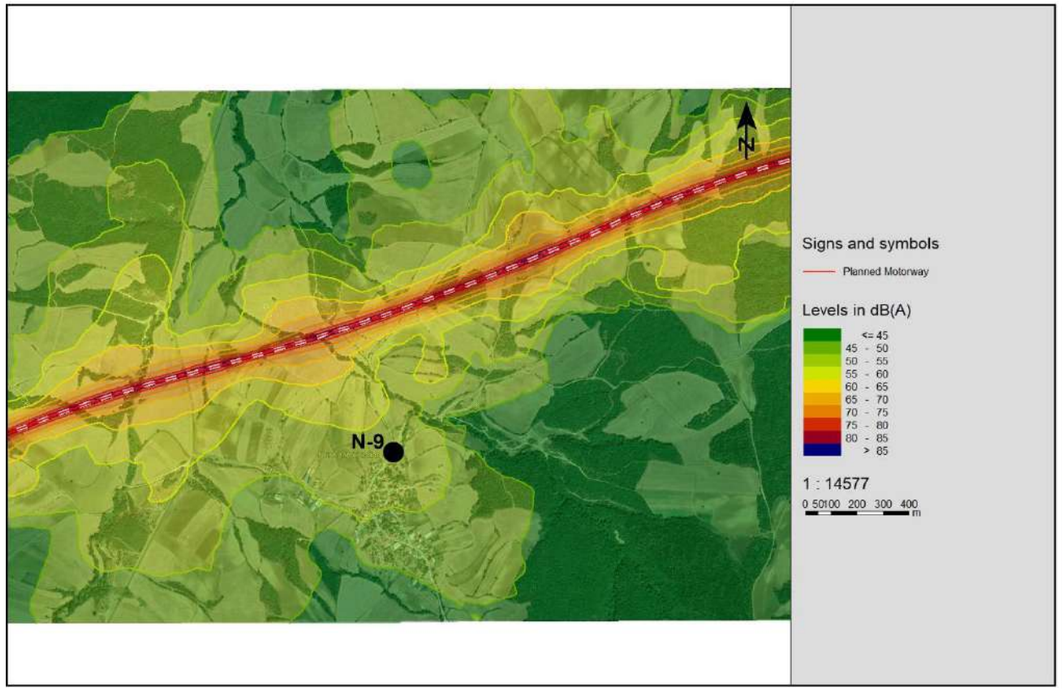

N-4
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 18524
0 100 200 400 600 800 m

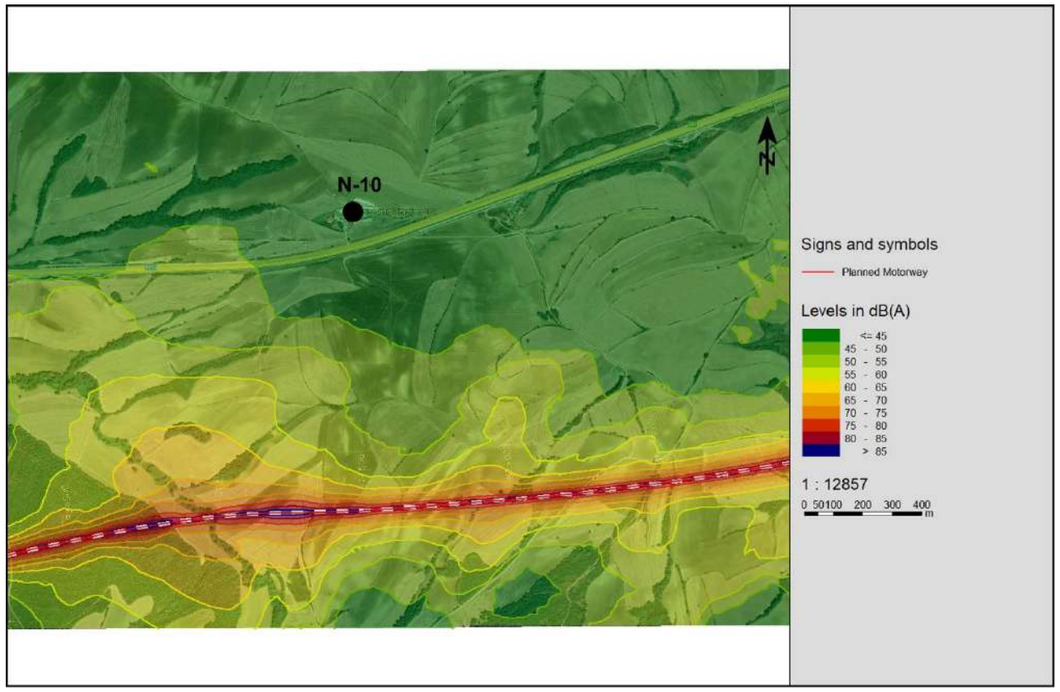

N-5
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14220
0 50100 200 300 400 m

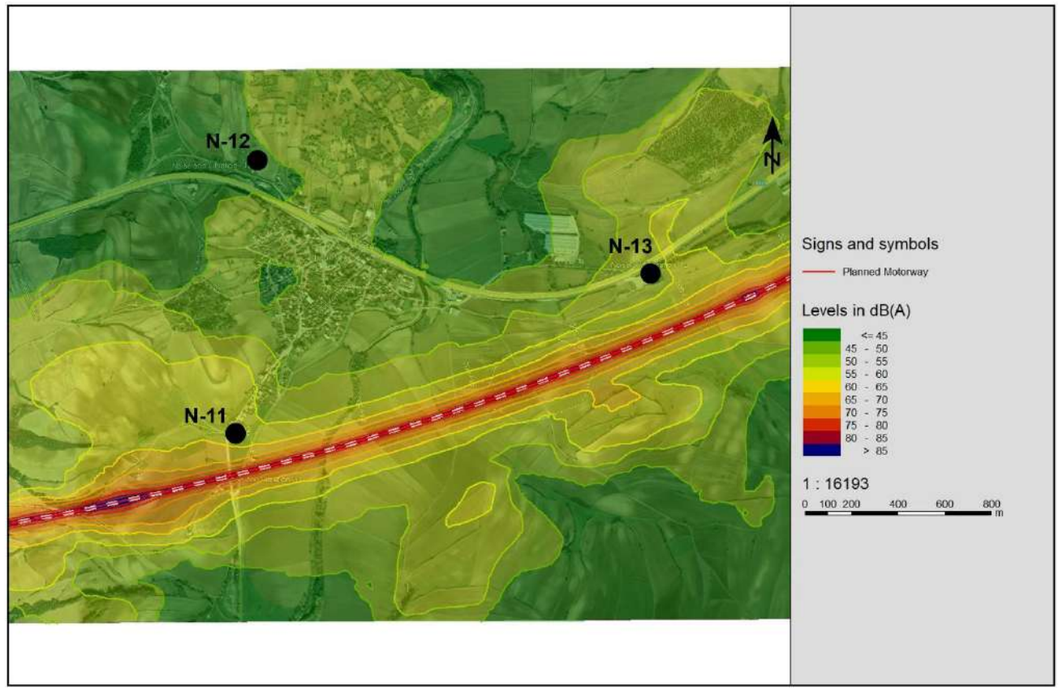

N-6
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 13865
0 50100 200 300 400 m

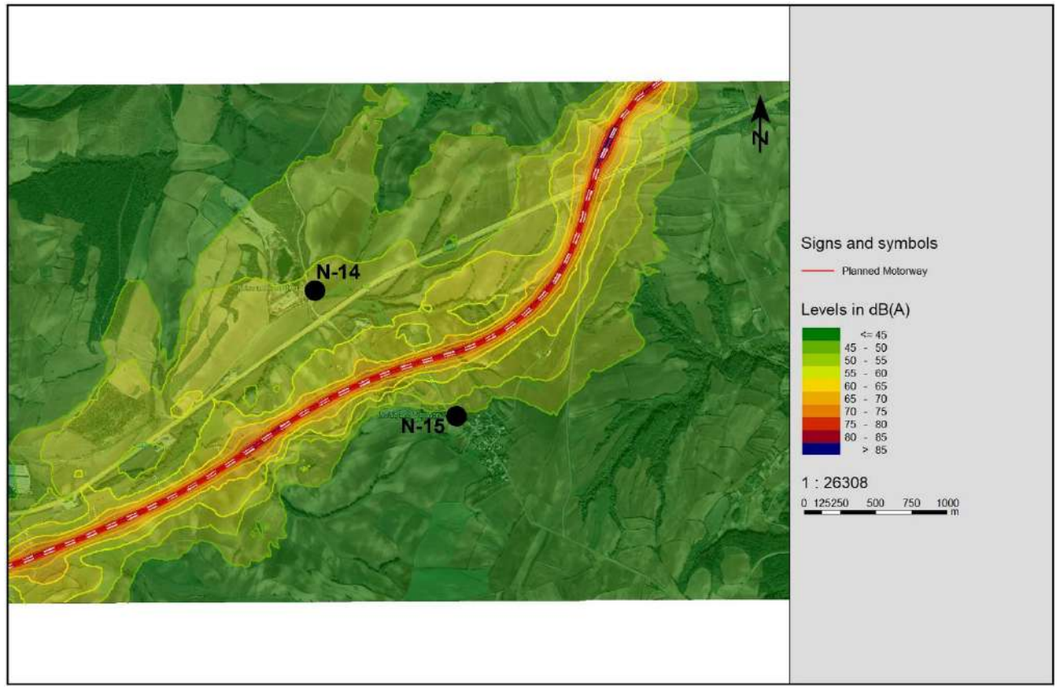

N-7
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 12109
0 50 100 200 300 400 m

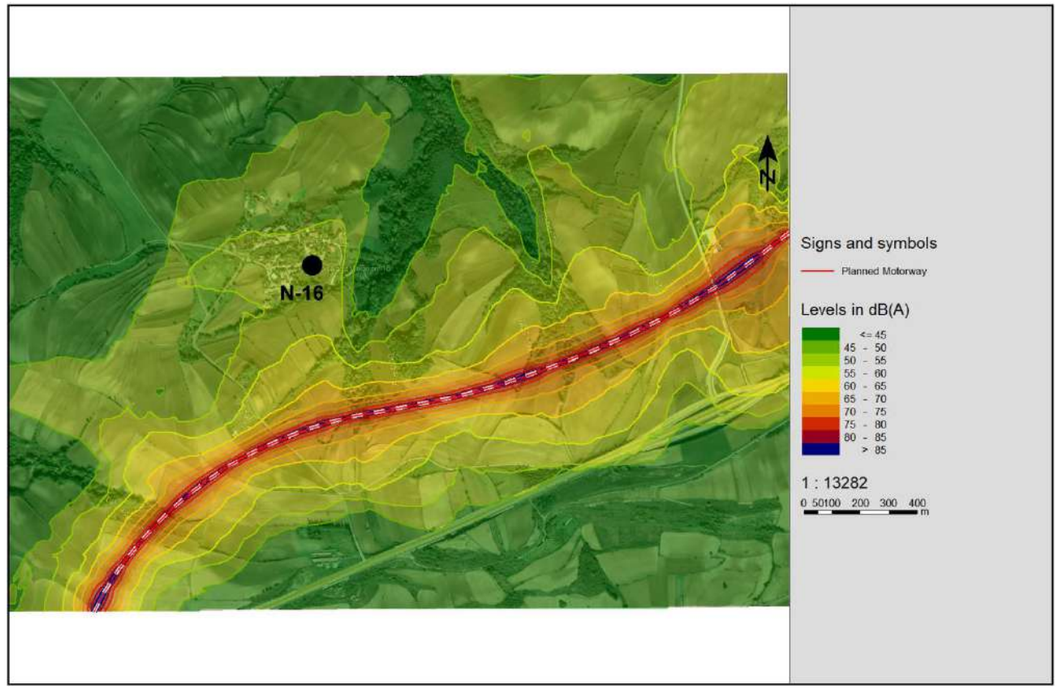

N-8
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 17067
0 100 200 400 600 800 m

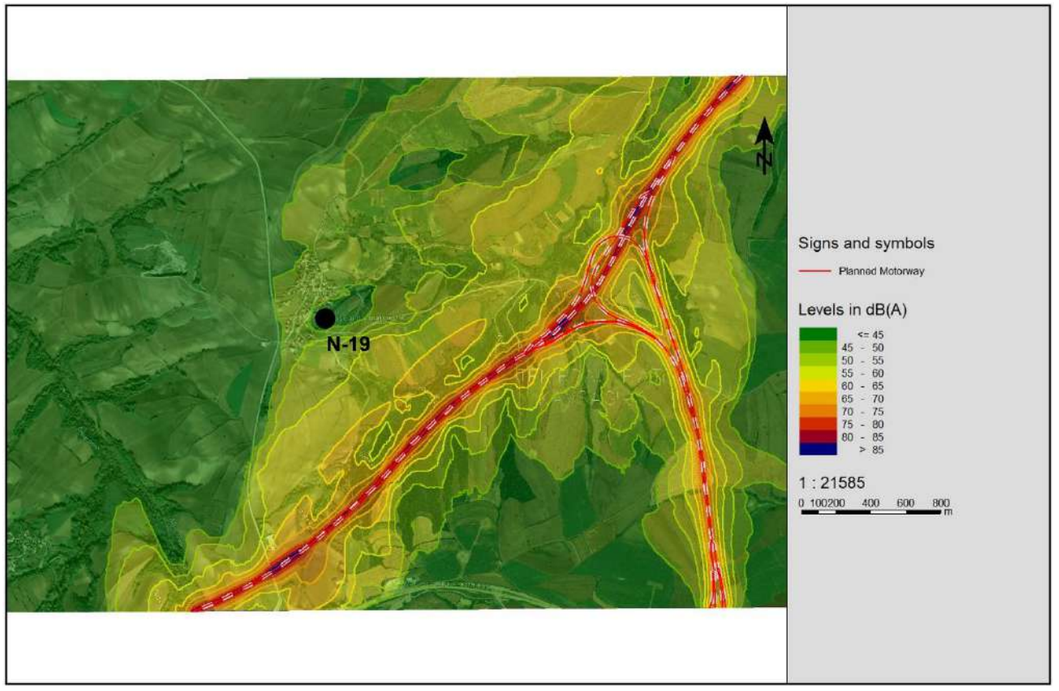

N-9
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14577
0 50 100 200 300 400 m

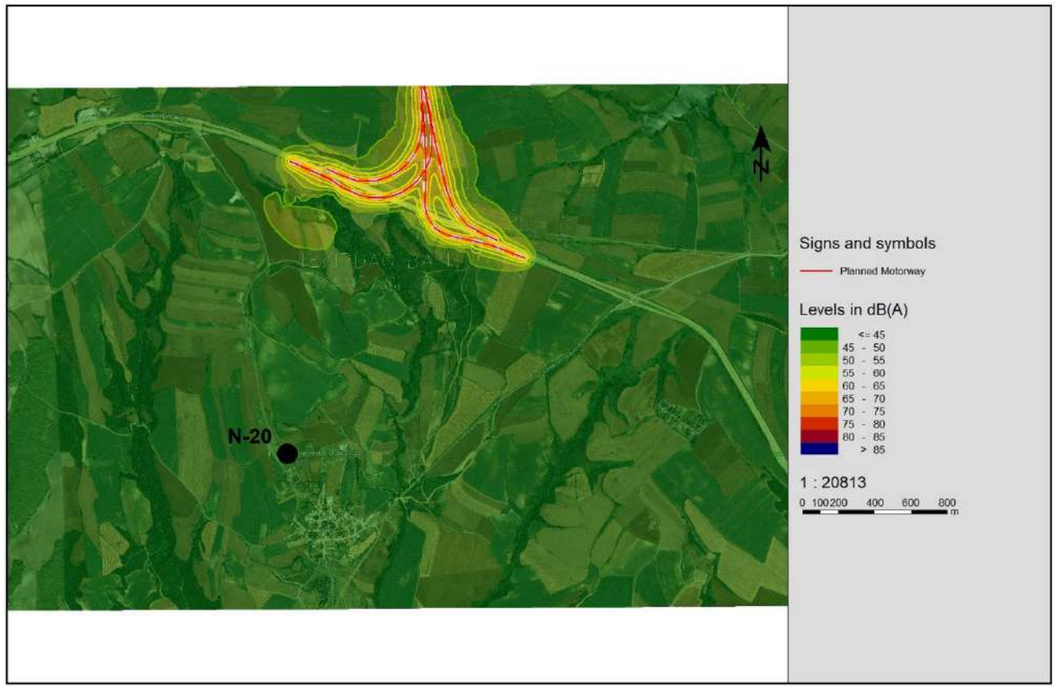

N-10
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 12857
0 50 100 200 300 400 m

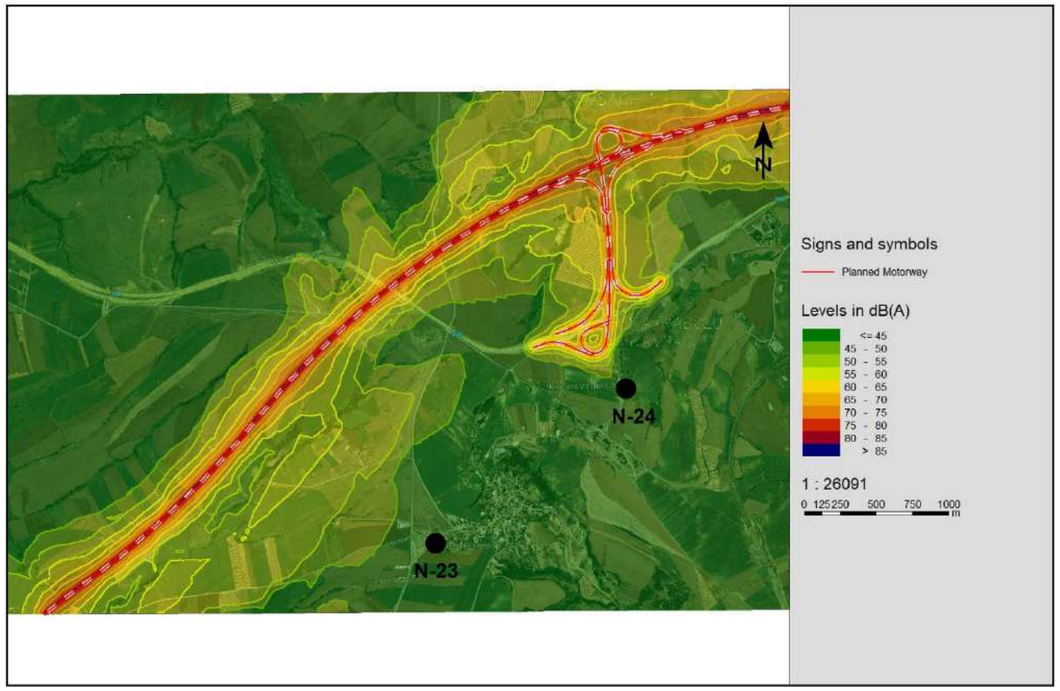

N-12
N-13
N-11
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 16193
0 100 200 400 600 800
m

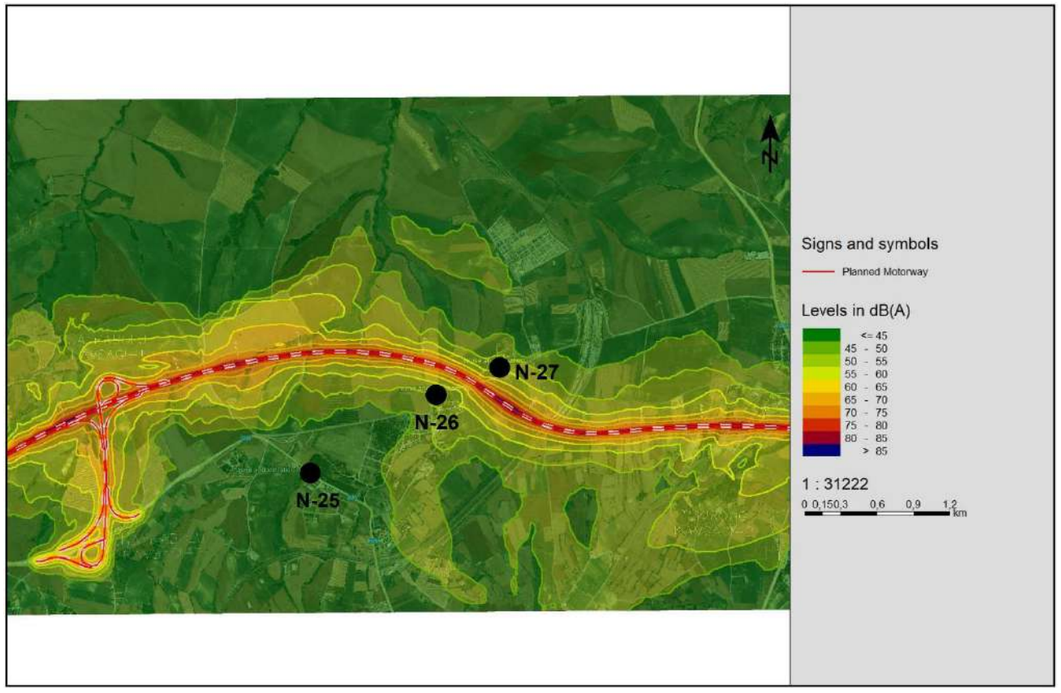

N-14
N-15
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 26308
0 125250 500 750 1000
m

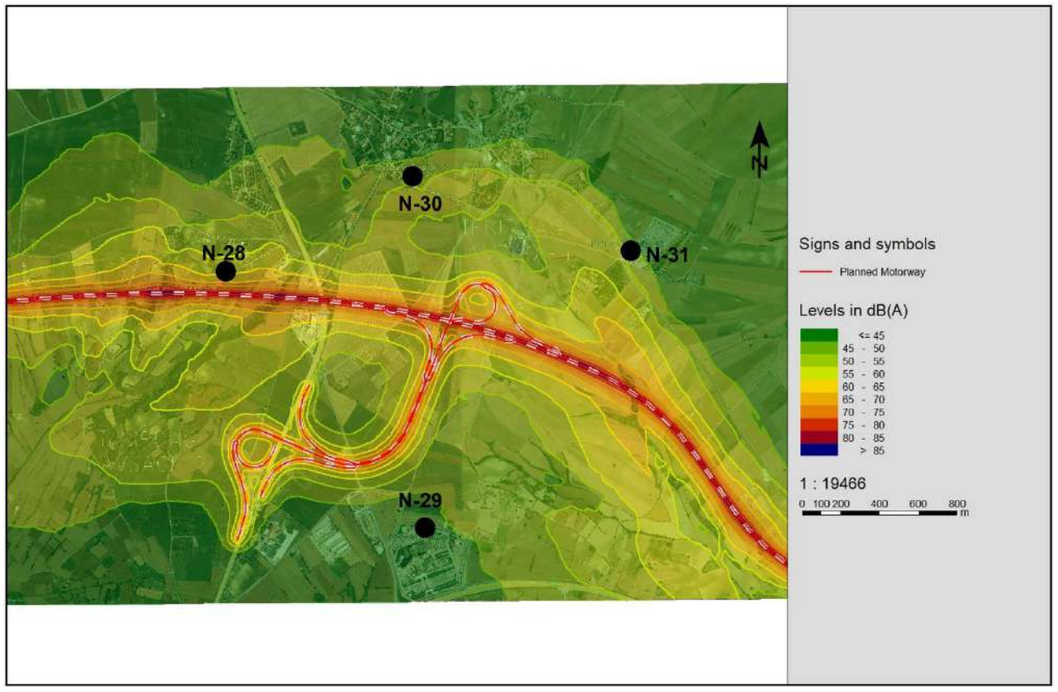

N-16
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 13282
0 50100 200 300 400
m

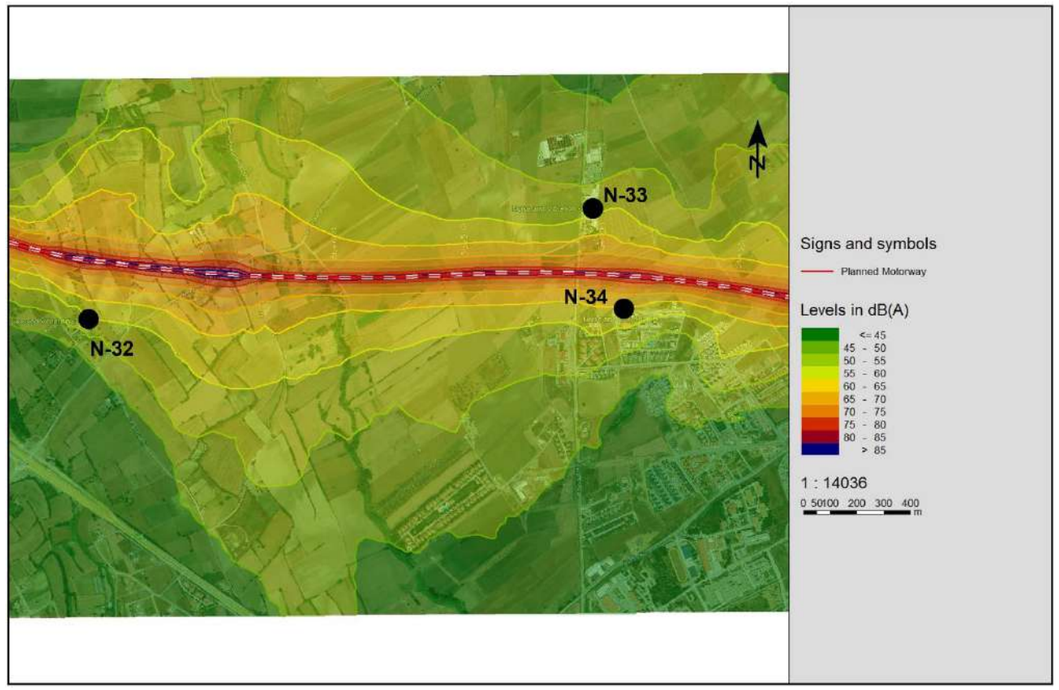

N-19
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 21585
0 100200 400 600 800
m

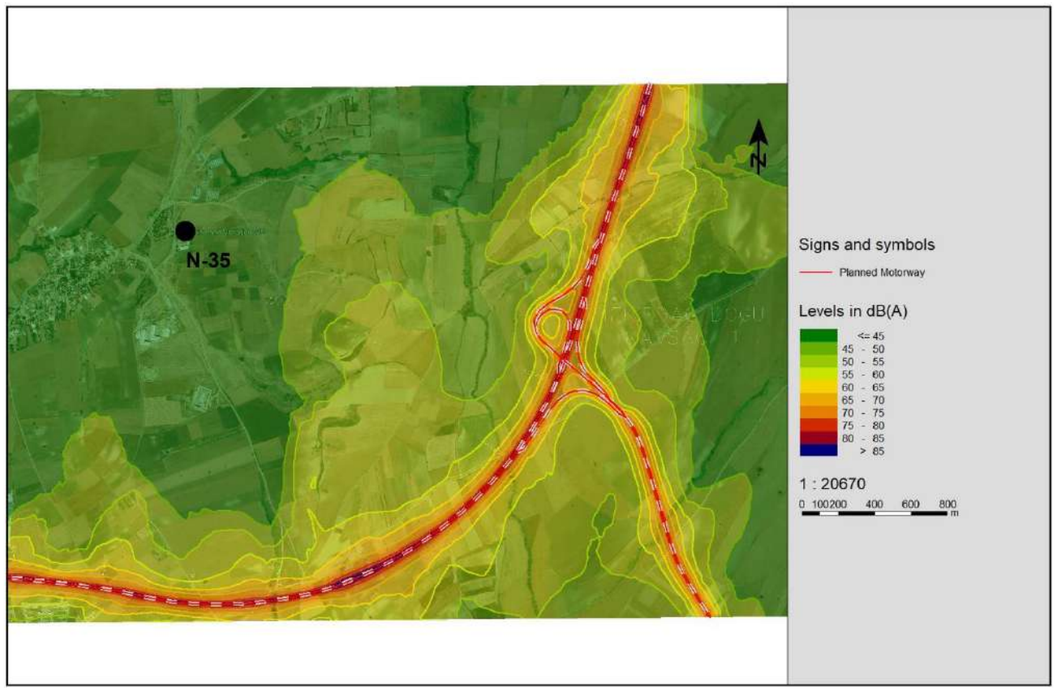

N-20
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 20813
0 100 200 400 600 800 m

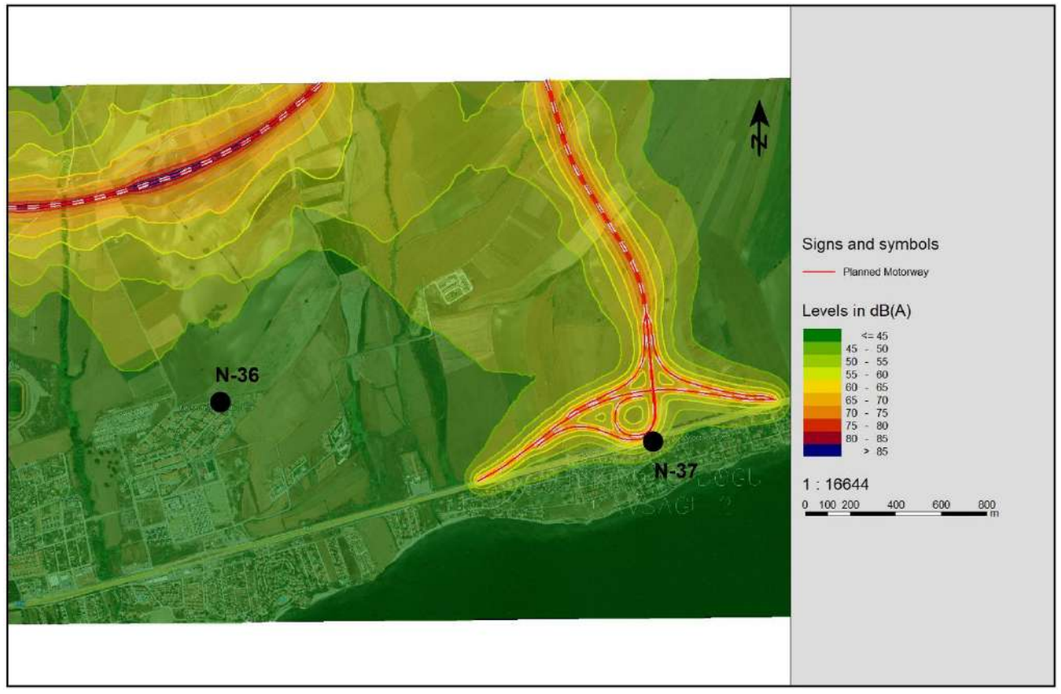

N-24
N-23
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 26091
0 125 250 500 750 1000 m

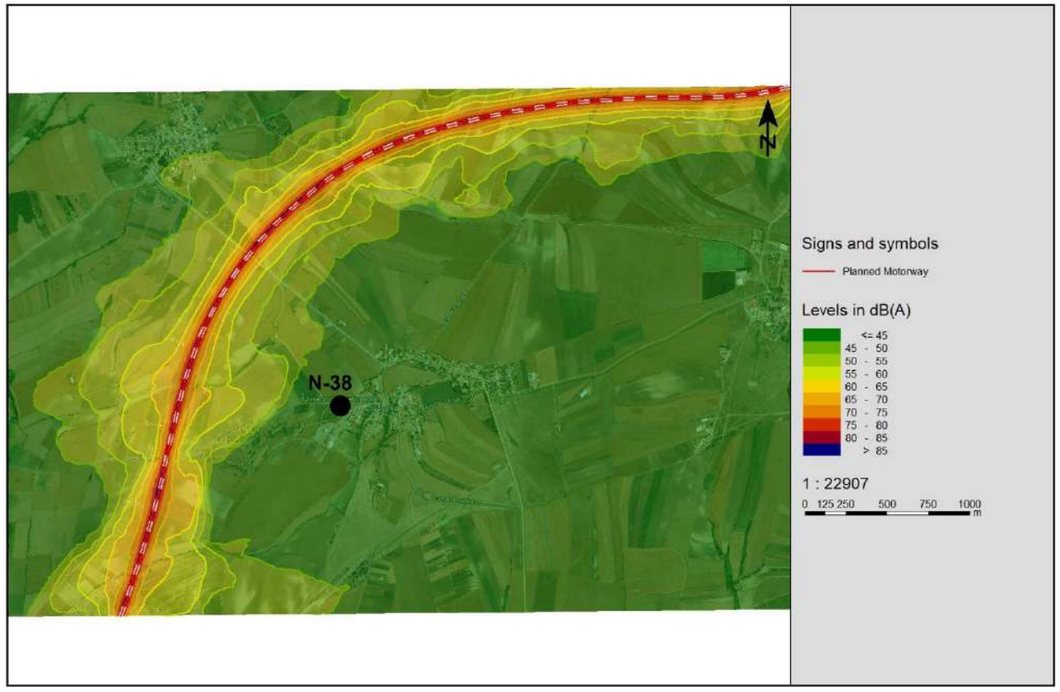

N-27
N-26
N-25
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 31222
0 0,15 0,3 0,6 0,9 1,2 km

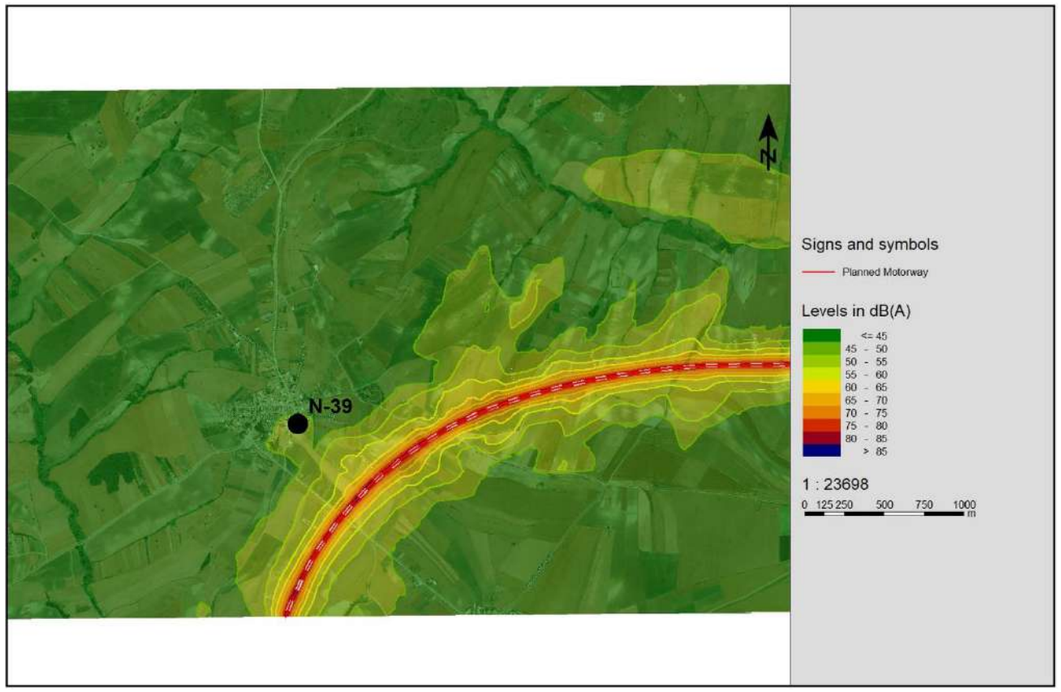

N-30
N-28
N-31
N-29
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 19466
0 100 200 400 600 800 m

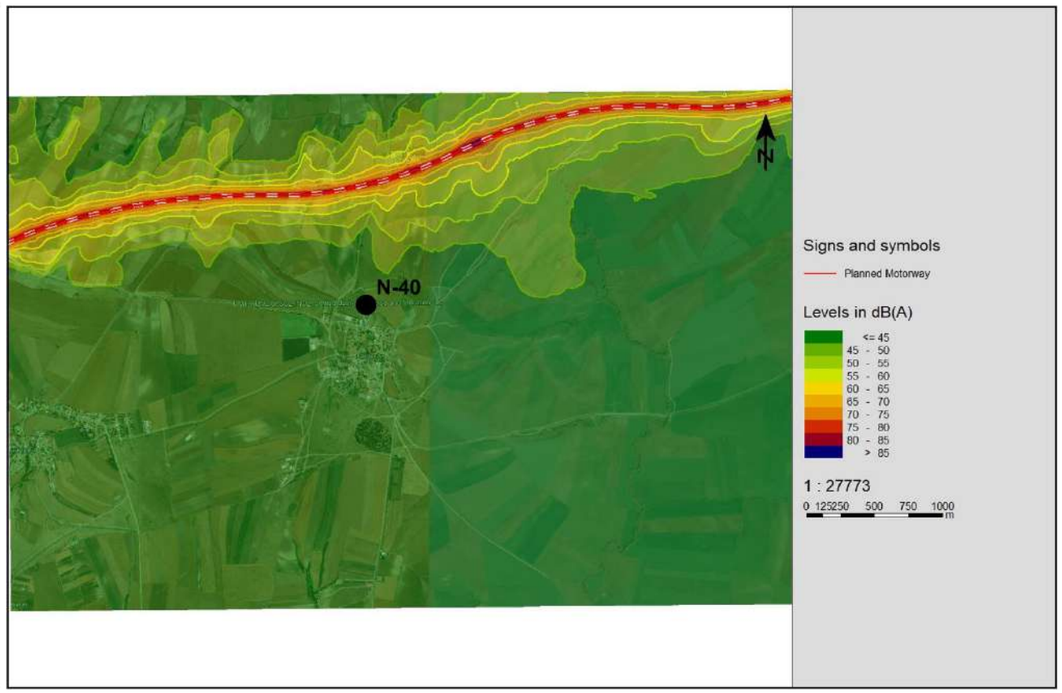

N-32
N-33
N-34
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14036
0 50100 200 300 400
m

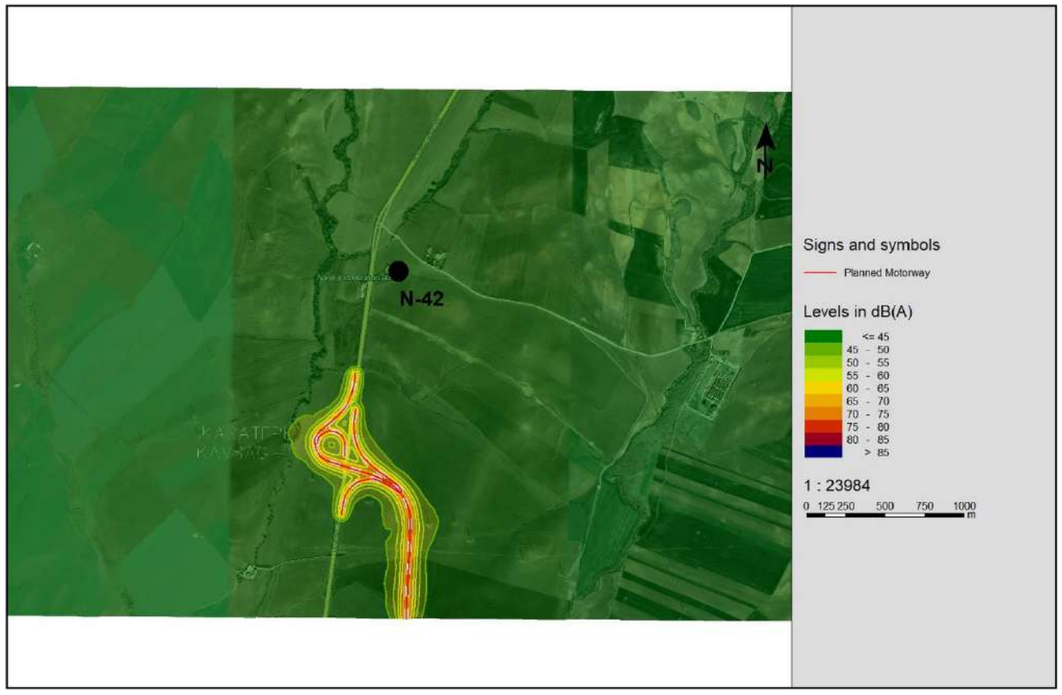

N-35
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 20670
0 100200 400 600 800
m

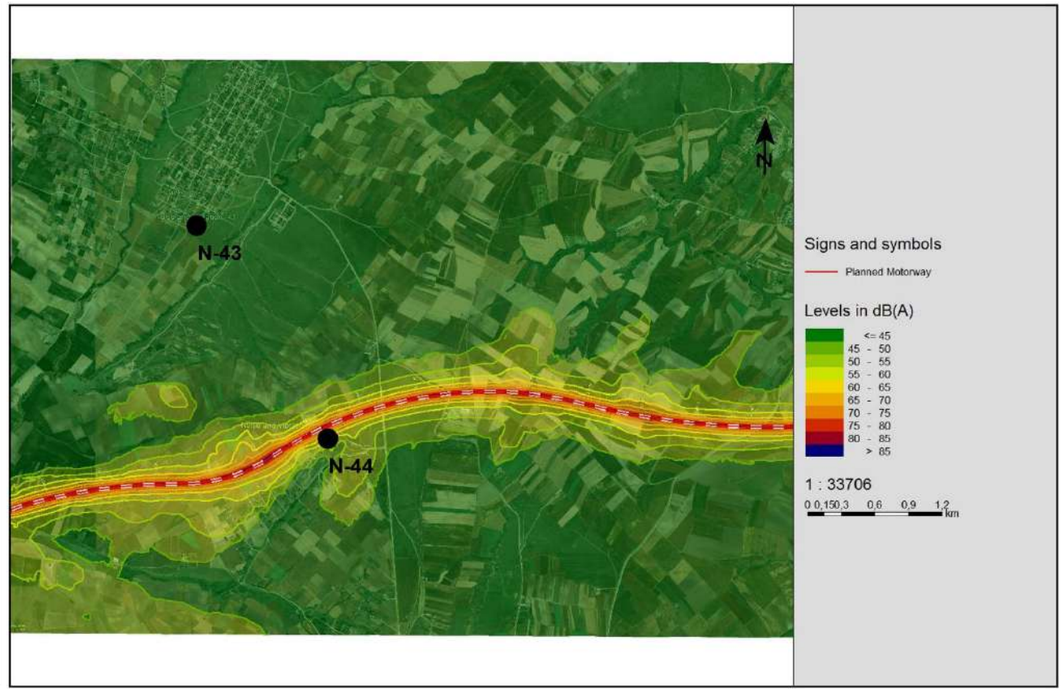

N-36
N-37
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 16644
0 100 200 400 600 800
m

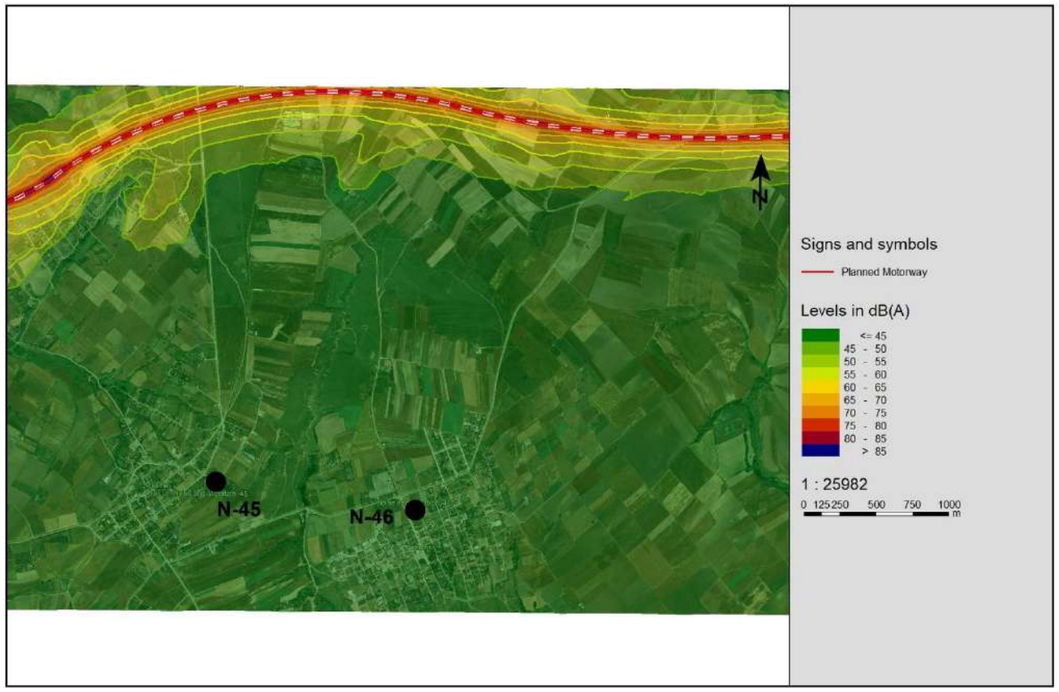

N-38
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 22907
0 125 250 500 750 1000
m

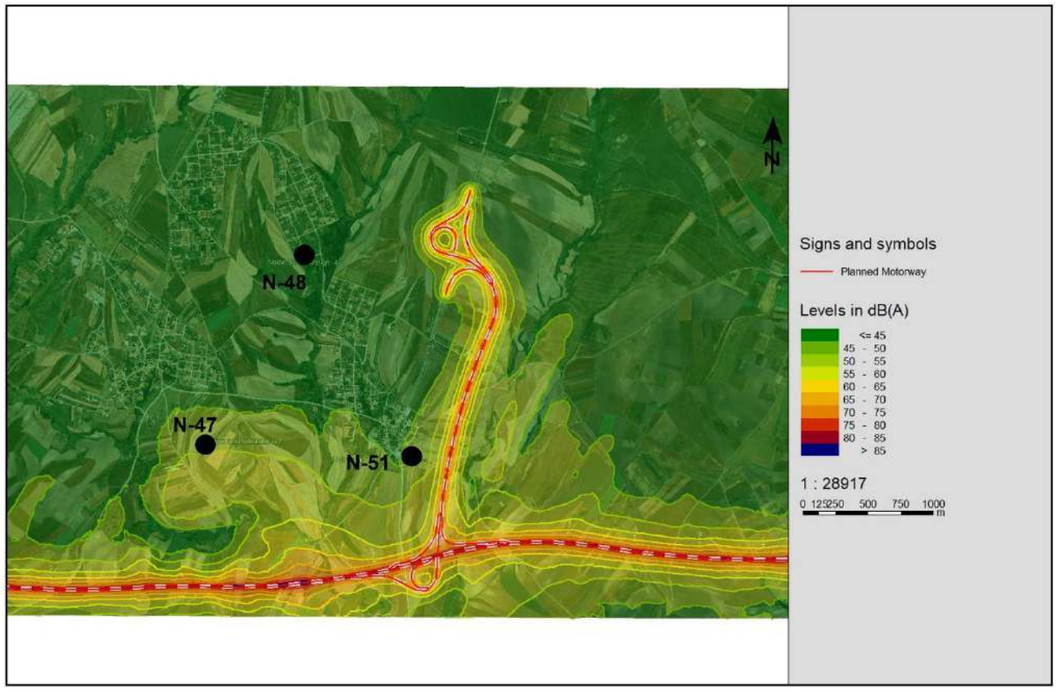

N-39
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 23698
0 125 250 500 750 1000 m

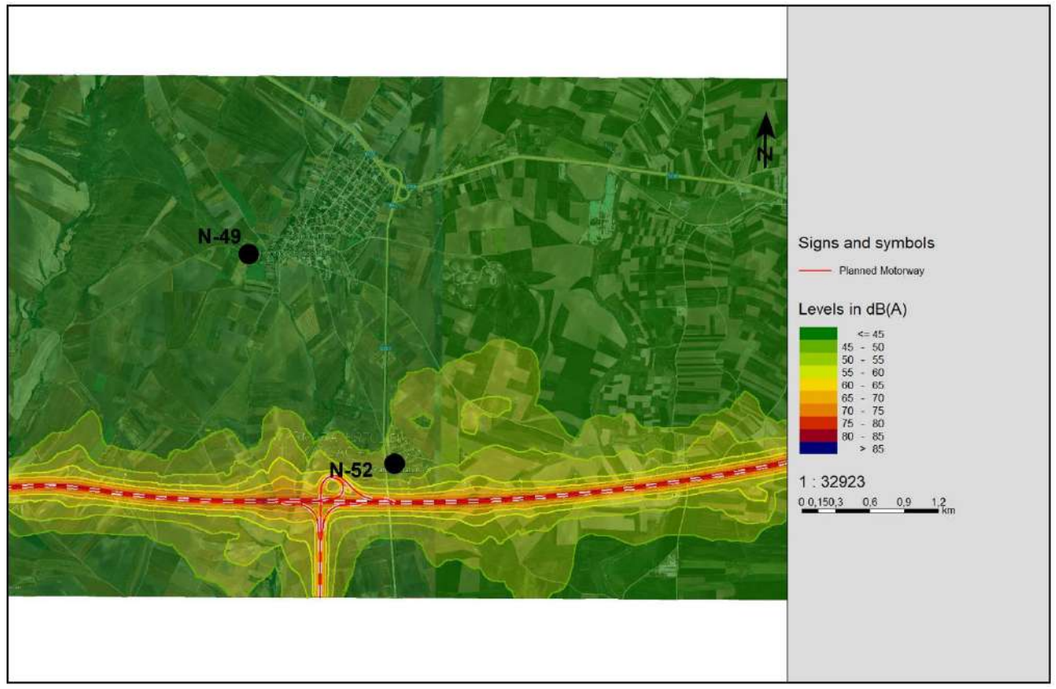

N-40
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 27773
0 125250 500 750 1000 m

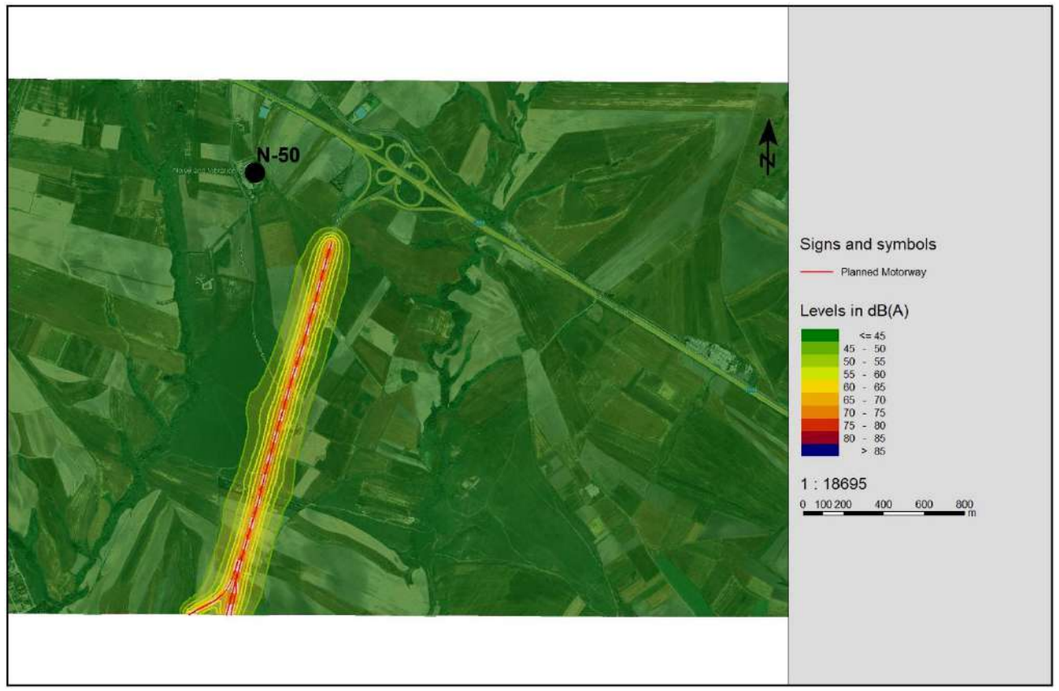

N-42
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 23984
0 125 250 500 750 1000 m

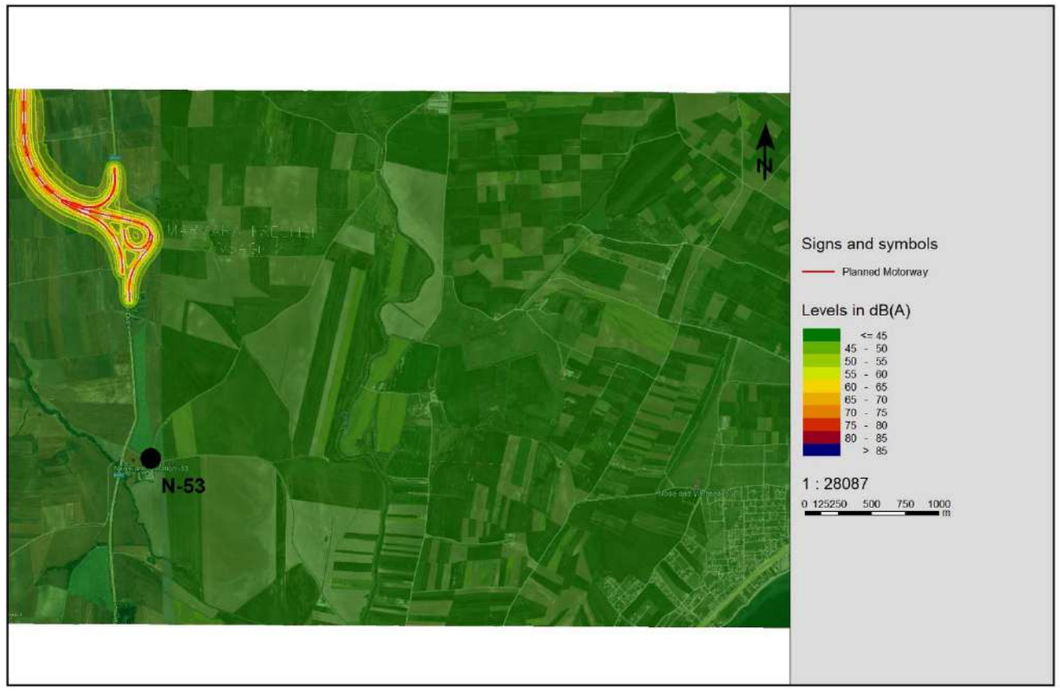

N-43
N-44
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 33706
0 0,150,3 0,6 0,9 1,2 km

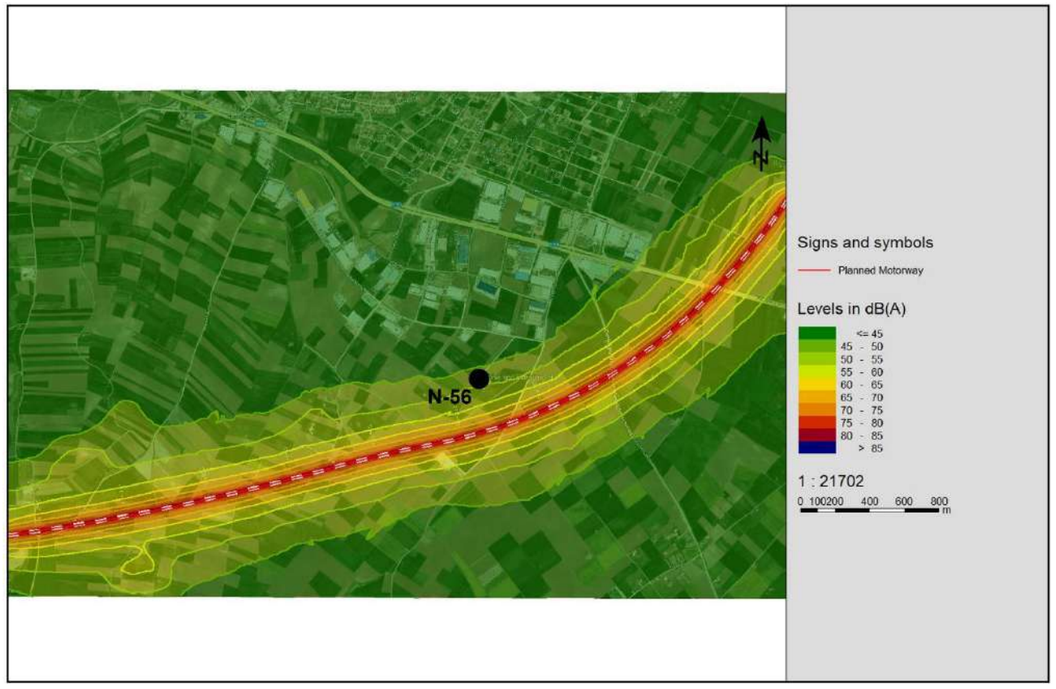

N-45
N-46
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 25982
0 125250 500 750 1000 m

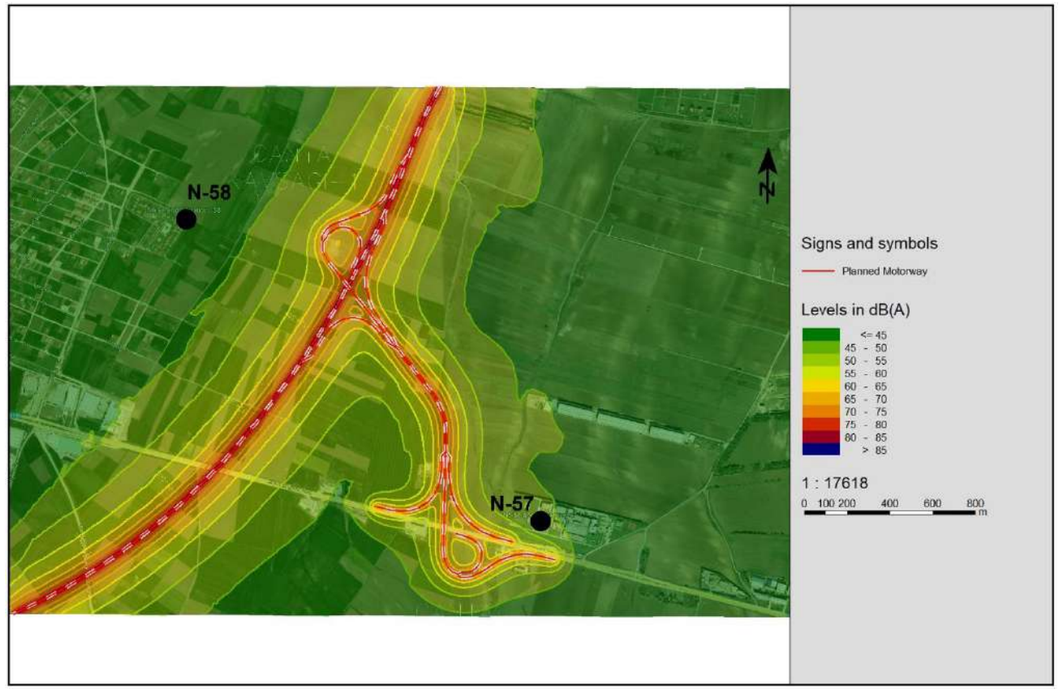

N-48
N-47
N-51
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 28917
0 125250 500 750 1000 m


N-49
N-52
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 32923
0 0,150,3 0,6 0,9 1,2 km


N-50
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 18695
0 100200 400 600 800 m


N-53
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 28087
0 125250 500 750 1000 m


N-56
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 21702
0 100200 400 600 800 m


N-58
N-57
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 17618
0 100 200 400 600 800 m


N-59
N
Signs and symbols
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 12479
0 50100 200 300 400 m

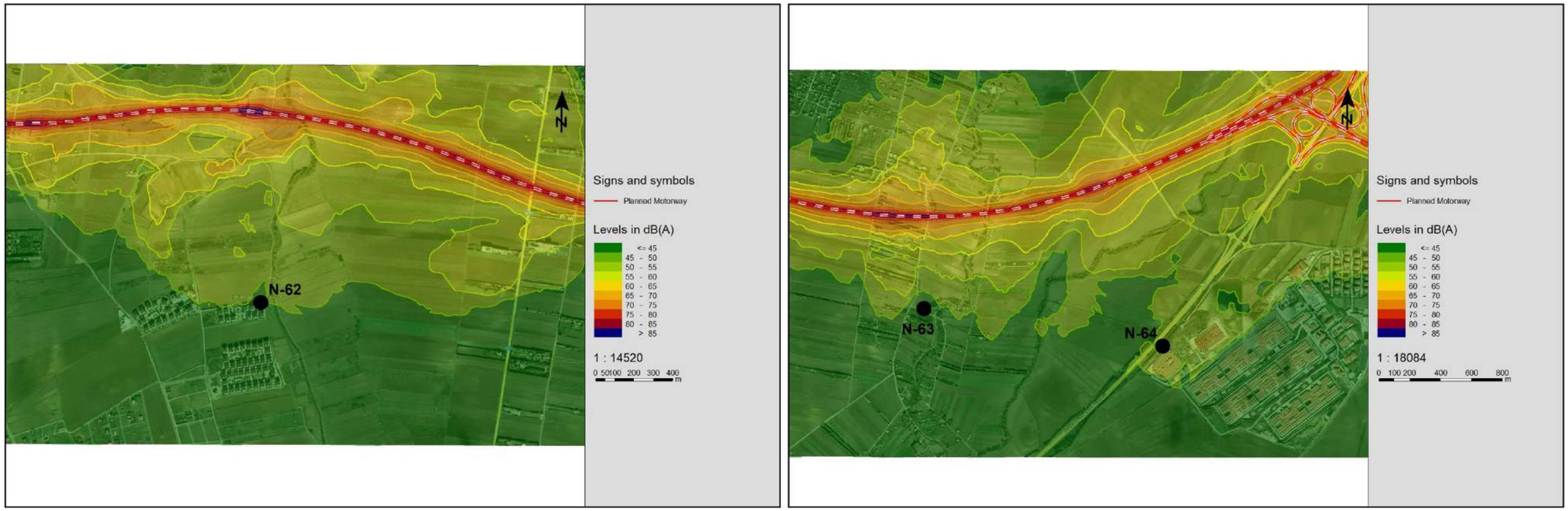



**Figure 239: Daytime Grid Noise Maps for the Operation Phase**

#### 7.1.9.3.3 Decommissioning and Closure Phase

A new impact is not expected during the decommissioning and closure phase of the Project, other than those listed in the construction and operation phases.

### *7.1.9.4 Mitigation Measures*

#### 7.1.9.4.1 Construction Phase

The mitigation measures listed below follow the mitigation hierarchy and will be implemented during the construction phase. It should be noted that the noise modelling studies and relevant assessments are based on the worst-case scenario assuming that all construction equipment will work on a single location simultaneously; therefore, in most of the time, the real increase in noise levels would be much lower than the predicted values above due to the homogeneous distribution of equipment on site and along the route.

During the construction phase, provisions of the “Regulation on Control of Environmental Noise” and “Regulation on Prevention of Workers from Risks Created from Noise” will be followed with the purpose of protecting both environment and health of employees with respect to noise impacts. Accordingly, appropriate personal protective equipment and materials such as ear protector or ear plug will be provided to protect workers from noise impacts.

The following control measures recommended by IFC will be applied where possible:

- Selection of equipment with lower sound power levels;
- Installing silencers for fans;
- Installing suitable mufflers on engine exhausts and compressor components;
- Installing acoustic enclosures for equipment casing radiating noise;
- Limiting the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas;
- Re-locating noise sources to less sensitive areas to take advantage of distance and shielding;
- Reducing Project traffic routing through community areas wherever possible;
- Developing a grievance mechanism to record and respond to complaints;
- Carrying out the regular maintenance of the construction equipment in order to minimize the possible high noise levels generated by the equipment; and
- Performing quarterly monitoring campaigns at the baseline noise measurement locations close to the active construction sites and/or associated facilities during the construction phase and taking necessary precautions accordingly.

In case of any noise related grievance, noise measurement campaign will be carried out immediately at the area where noise related grievance is received. If monitoring results indicate that noise levels are above the defined limits, Client will reduce/limit the number of equipment at the construction site, until the construction noise levels are reduced below the limit values.

In addition to the above given measures, noise barriers could be installed without any gaps and with a continuous minimum surface density of 10 kg/m$^2$ in order to minimize the transmission of sound through the barrier. Barriers should be located as close to the source or to the receptor location to be effective.

#### 7.1.9.4.2 Operation Phase

During the operation phase, provisions of the “Regulation on Control of Environmental Noise” and “Regulation on Prevention of Workers from Risks Created from Noise” will be followed with the purpose of protecting health of employees with respect to noise impacts. Accordingly, appropriate personal protective equipment and materials such as ear protector or ear plug will be provided to protect workers from noise impacts. In addition, maintenance of the equipment will be made regularly to ensure high noise levels are minimized.

Following measures will be taken to reduce the potential noise effects during the operation phase of the Project:

- NL04 – SMA-NL5 type asphalt will be used within the scope of the Project.
- Maintenance of the motorway will be carried out regularly to reduce the roughness of running surfaces, so the noise levels are minimized;
- Noise levels will be monitored at the receptors where the defined noise limit values are exceeded, at least for a year on quarterly basis;
- In case of any noise related grievance, noise measurement campaign will be carried out immediately at the area where noise related grievance is received; and
- In cases when monitoring results indicate that noise levels are above the defined limits, then noise abatement measures will be implemented (e.g. noise barriers, walls or earth berms along motorway route or next to receptor buildings, soundproofing, relocation of the sensitive receptor, etc).

For the noise measurement locations/receptors N5, N9, N11, N16, N26, N27, N28, N30, N31, N32, N33, N34, N37, N39, N44, N47, N51, N52, N59, N62, N64 and N65 where Turkish regulatory limit values and/or IFC standards are exceeded for the operation phase, noise modelling studies have been performed with the implementation of noise abatement measures for the cumulative assessment of the operation phase activities.

The calculated noise levels at the chosen receptors, the cumulative results and the comparison of the results with the IFC standards and Turkish limit values are presented in Table 218. According to the modelling results, cumulative noise levels at all locations are below both the Turkish regulatory limit values and IFC standards with the implementation of above-mentioned noise abatement measures.

It should be noted that the modelling studies conducted for the implementation of noise abatement measures are intended to be indicative and should not be the sole basis for the final design of these measures. Accordingly, a detailed noise modelling studies which includes long term noise measurement studies, are recommended to be conducted for determination of the design details and locations of the noise abatement measures during the superstructure design phase. Based on that, noise abatement measures will be installed/established prior to the operation phase of the Project, in order to ensure that noise emissions resulting from the vehicles passing through the motorway are properly mitigated and residual noise levels are below the limit values.

Specific noise mitigation measures will be selected and designed to achieve compliance with Turkish Regulation on Control of Environmental Noise, the IFC’s Performance Standards, the IFC/World Bank EHS Guidelines and relevant good international industry practice.

If noise abatement measures need identified after the detailed studies, intensive stakeholder engagement activities will be performed with the affected local community. If possible, noise abatement measures will be placed close to the motorway not to the receptor building. If installation/establishment of noise abatement measures at the receptor building is considered as the sole solution, specific stakeholder engagement activities will be carried out with the affected residents/people. If any of the mitigation measures listed is not able to lower

the noise emission below the limits, additional actives may need to be considered such as improving the condition of the residential building (building sound isolation etc.) or resettlement.

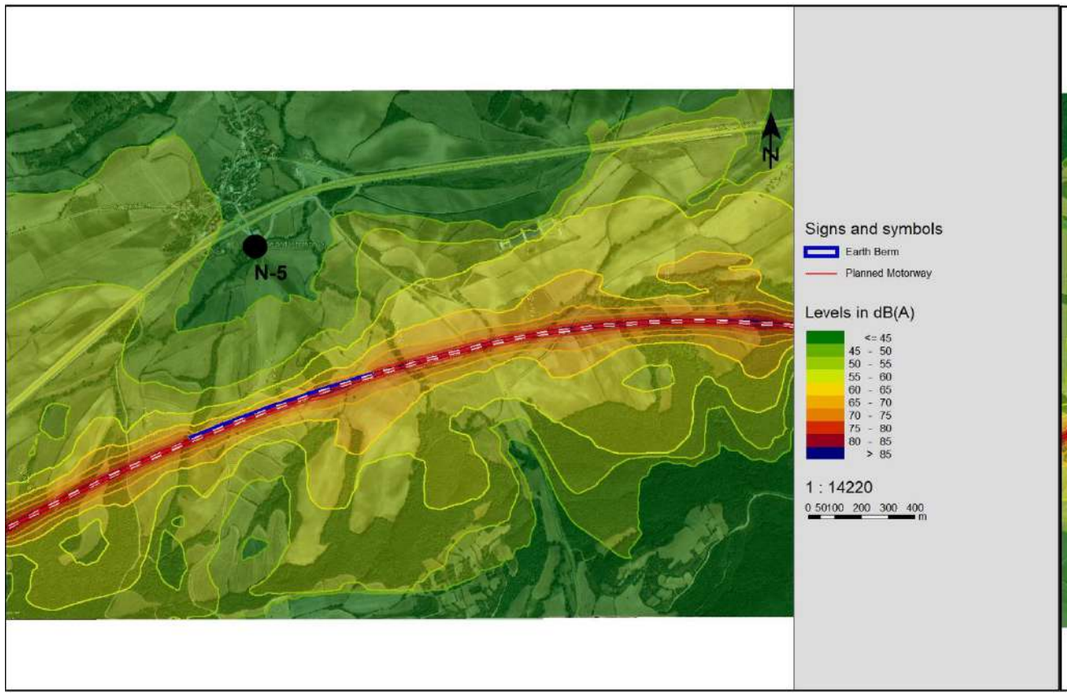
The daytime grid noise maps obtained for the operation phase activities with the implementation of noise abatement measures, are presented in the Figure 240.

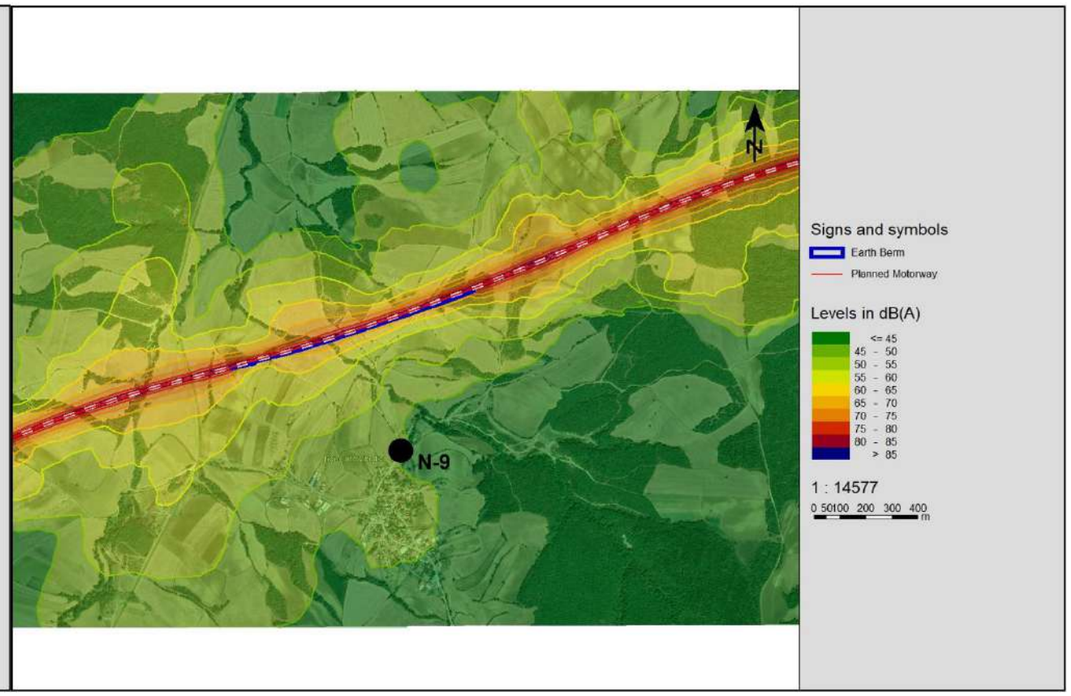
**Table 218: Modelled Operational Noise Levels with the Implementation of Noise Abatement Measures**

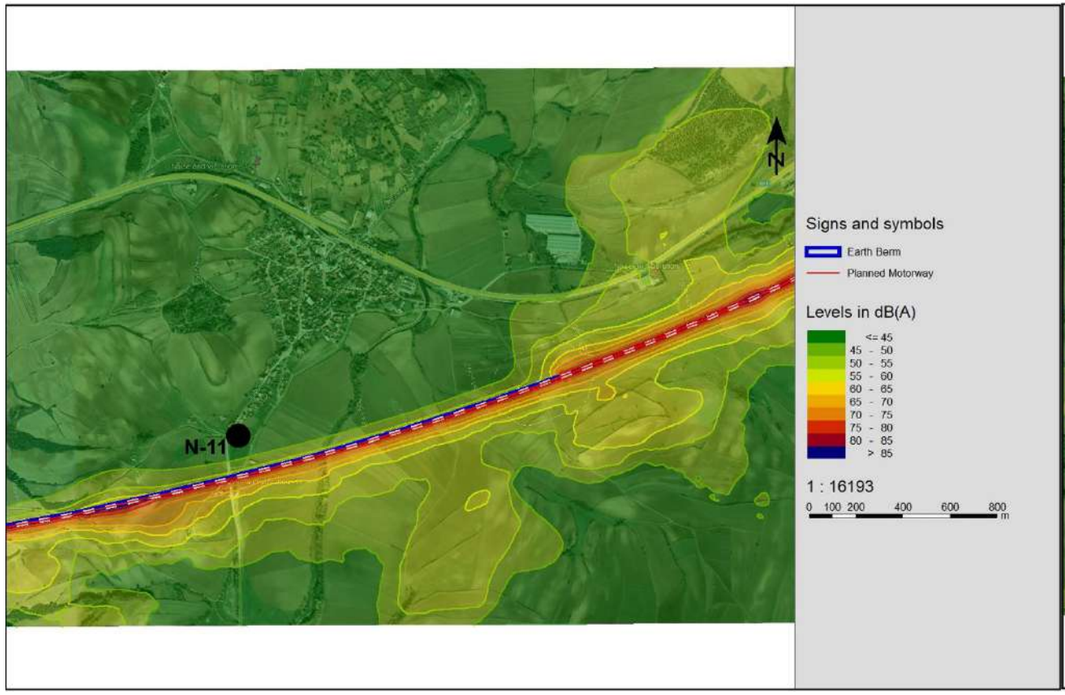
| Measurement Point | Measurement Location | | | | | Proposed Mitigation Measure* | Modelled Noise Level (originated from Project activities with the implementation of noise abatement measures) (dBA) | | | | | Modelled Noise Level +Baseline Noise Level (dBA) | | | | | Difference Between Baseline and Modelled Sound Levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Province | District | Village | Receptor Type | Distance to Motorway Route (m) | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | | | | | | | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N5 | Tekirdağ | Malkara | Yenice | R | 600 | Installation of 2 m earth berm along the motorway route | 41.2 | 39.1 | 41.2 | 41.2 | 39.1 | 51.0 | 44.8 | 51.7 | 47.7 | 44.3 | 0.5 | 1.4 | 0.4 | 1.1 | 1.6 |
| N9 | Tekirdağ | Süleymanpaşa | Akçahalil | R | 520 | Installation of 2 m earth berm along the motorway route | 44.8 | 42.9 | 44.8 | 44.8 | 42.9 | 49.3 | 44.6 | 50.5 | 46.6 | 44.5 | 1.9 | 4.9 | 1.4 | 4.8 | 5.0 |
| N11 | Tekirdağ | Süleymanpaşa | İnecik | R | 165 | Installation of 4 m earth berm along the motorway route | 40.8 | 38.7 | 40.8 | 40.8 | 38.7 | 49.4 | 45.0 | 50.4 | 46.7 | 45.0 | 0.6 | 1.1 | 0.5 | 1.3 | 1.1 |
| N16 | Tekirdağ | Süleymanpaşa | Güvençli | R | 520 | Installation of 3 m earth berm along the motorway route | 43.8 | 42.0 | 43.8 | 43.8 | 42.0 | 49.5 | 44.8 | 50.6 | 46.9 | 44.8 | 1.3 | 3.3 | 1.0 | 2.9 | 3.2 |
| N26 | Tekirdağ | Süleymanpaşa | Kayı | R | 270 | Installation of 3 m earth berm along the motorway route | 42.2 | 40.3 | 42.2 | 42.2 | 40.3 | 49.2 | 43.8 | 50.8 | 44.5 | 43.8 | 1.0 | 2.6 | 0.6 | 3.9 | 2.5 |
| N27 | Tekirdağ | Süleymanpaşa | Kayı | R | 190 | Installation of 2 m noise barrier with low absorption capacity and 5 m earth berm along the motorway route, respectively | 43.8 | 42.0 | 43.8 | 43.8 | 42.0 | 50.9 | 45.0 | 51.8 | 47.2 | 44.8 | 0.9 | 3.0 | 0.7 | 2.7 | 3.2 |
| N28 | Tekirdağ | Süleymanpaşa | Kayı | R | 110 | Installation of 2 m noise barrier with low absorption capacity and 2 m earth berm along the motorway route, respectively | 45.1 | 43.2 | 45.1 | 45.1 | 43.2 | 49.9 | 44.9 | 51.4 | 46.7 | 44.7 | 1.8 | 4.8 | 1.2 | 5.2 | 5.2 |
| N30 | Tekirdağ | Süleymanpaşa | Kayı | R | 600 | Installation of 2 m earth berm along the motorway route | 43.4 | 41.5 | 43.4 | 43.4 | 41.5 | 51.2 | 44.9 | 53.2 | 45.6 | 45.1 | 0.8 | 2.7 | 0.5 | 4.0 | 2.5 |
| N31 | Tekirdağ | Süleymanpaşa | Kayı | R | 660 | Installation of 2 m earth berm along the motorway route | 41.7 | 39.8 | 41.7 | 41.7 | 39.8 | 50.4 | 43.8 | 51.8 | 45.4 | 43.9 | 0.6 | 2.2 | 0.4 | 2.4 | 2.1 |
| N32 | Tekirdağ | Süleymanpaşa | Köseilyas | R | 250 | Installation of 4 m noise barrier with low absorption capacity and 5 m earth berm along the motorway route, respectively | 41.5 | 39.8 | 41.5 | 41.5 | 39.8 | 51.6 | 44.3 | 52.8 | 46.7 | 44.0 | 0.4 | 1.9 | 0.3 | 1.6 | 2.0 |
| N33 | Tekirdağ | Süleymanpaşa | Köseilyas | R | 220 | Installation of 5 m noise barrier with low absorption capacity and 3 m earth berm along the motorway route, respectively | 42.9 | 41.0 | 42.9 | 42.9 | 41.0 | 49.7 | 44.6 | 51.4 | 46.4 | 44.4 | 1.0 | 2.5 | 0.7 | 2.6 | 2.7 |
| N34 | Tekirdağ | Süleymanpaşa | Köseilyas | R | 150 | Installation of 6.5 m noise barrier with low absorption capacity and 6 m earth berm along the motorway route, respectively. Additionally, installation of the 6.5 m noise barrier with low absorption capacity at the receptor building entrance | 42.8 | 40.6 | 42.8 | 42.8 | 40.6 | 50.9 | 45.0 | 51.8 | 47.1 | 45.1 | 0.7 | 1.9 | 0.6 | 2.0 | 1.9 |
| N37 | Tekirdağ | Süleymanpaşa | Bahçelievler | R | 50 | Installation of 2 m noise barrier with low absorption capacity along the motorway route | 44.1 | 42.6 | 44.1 | 44.1 | 42.6 | 50.2 | 44.6 | 51.0 | 46.8 | 44.5 | 1.2 | 4.3 | 1.0 | 3.4 | 4.5 |
| N39 | Tekirdağ | Süleymanpaşa | Husunlu | R | 560 | Installation of 3 m earth berm along the motorway route | 42.3 | 40.1 | 42.3 | 42.3 | 40.1 | 50.3 | 44.9 | 51.7 | 47.6 | 44.6 | 0.7 | 1.8 | 0.5 | 1.5 | 1.9 |
| N44 | Tekirdağ | Marmaraereğlisi | Çeşmeli | R | 60 | Installation of 5 m noise barrier with low absorption capacity and 5 m earth berm along the motorway route, respectively | 43.9 | 41.5 | 43.9 | 43.9 | 41.5 | 50.0 | 45.0 | 51.9 | 45.9 | 45.3 | 1.2 | 2.5 | 0.8 | 4.4 | 2.4 |

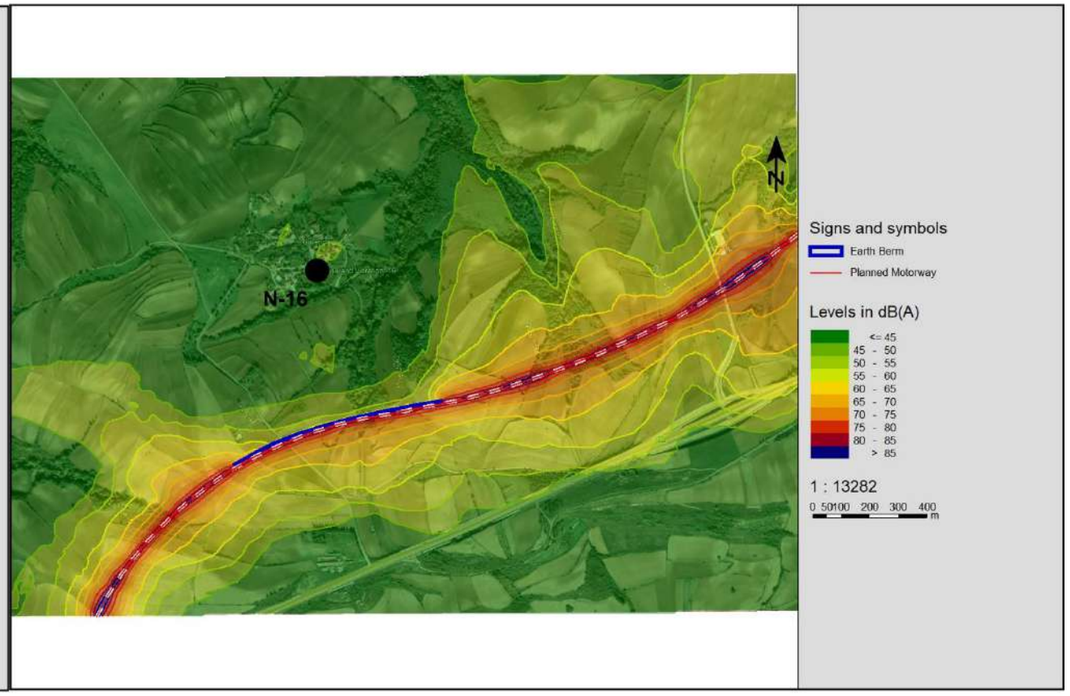
| Measurement Point | Measurement Location | | | | | Proposed Mitigation Measure* | Modelled Noise Level (originated from Project activities with the implementation of noise abatement measures) (dBA) | | | | | Modelled Noise Level +Baseline Noise Level (dBA) | | | | | Difference Between Baseline and Modelled Sound Levels (dBA) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Province | District | Village | Receptor Type | Distance to Motorway Route (m) | | IFC | | Turkish | | | IFC | | Turkish | | | IFC | | Turkish | | |
| | | | | | | | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) | Day (07-22) | Night (22-07) | Day (07-19) | Evening (19-23) | Night (23-07) |
| N47 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | 1,050 | Installation of 3 m noise barrier with low absorption capacity and 3 m earth berm along the motorway route, respectively | 41.6 | 39.6 | 41.6 | 41.6 | 39.6 | 50.9 | 44.4 | 53.4 | 44.1 | 44.4 | 0.5 | 1.8 | 0.3 | 3.6 | 1.8 |
| N51 | Tekirdağ | Marmaraereğlisi | Yakuplu | R | 280 | Installation of 3 m noise barrier with low absorption capacity and 4 m earth berm along the motorway route, respectively | 43.4 | 41.4 | 43.4 | 43.4 | 41.4 | 50.9 | 45.0 | 51.6 | 48.0 | 44.9 | 0.9 | 2.5 | 0.7 | 1.9 | 2.5 |
| N52 | Tekirdağ | Çorlu | Seymen | R | 330 | Installation of 2 m earth berm along the motorway route | 43.5 | 41.6 | 43.5 | 43.5 | 41.6 | 49.5 | 44.9 | 49.8 | 46.4 | 45.0 | 1.2 | 2.8 | 1.2 | 3.2 | 2.7 |
| N59 | İstanbul | Silivri | Balaban | R | 90 | Installation of 2.5 m noise barrier with low absorption capacity and 3 m earth berm along the motorway route, respectively | 44.7 | 42.6 | 44.7 | 44.7 | 42.6 | 51.0 | 44.9 | 50.1 | 47.0 | 44.7 | 1.2 | 3.9 | 1.5 | 3.8 | 4.1 |
| N62 | İstanbul | Silivri | Sancaktepe | R | 1,000 | Installation of 1 m earth berm along the motorway route | 43.0 | 41.1 | 43.0 | 43.0 | 41.1 | 51.6 | 45.0 | 52.3 | 48.6 | 44.5 | 0.6 | 2.2 | 0.5 | 1.4 | 2.6 |
| N64 | İstanbul | Silivri | Semizkumlar | R | 1,160 | Installation of 3.5 m noise barrier with low absorption capacity and 4 m earth berm along the motorway route, respectively | 39.9 | 38.2 | 39.9 | 39.9 | 38.2 | 53.5 | 45.0 | 52.7 | 45.3 | 45.8 | 0.2 | 1.0 | 0.2 | 1.5 | 0.8 |
| N65 | İstanbul | Silivri | Yolcatı | R | 1,200 | Installation of 2 m noise barrier with low absorption capacity and 2 m earth berm along the motorway route, respectively | 34.2 | 32.4 | 34.2 | 34.2 | 32.4 | 51.8 | 45.0 | 52.4 | 47.6 | 44.5 | 0.1 | 0.2 | 0.1 | 0.2 | 0.3 |
| IFC Noise Standards[1,2] | Industrial; commercial areas | | | | | | **70** | **70** | - | - | - | **70** | **70** | - | - | - | **3** | **3** | - | - | - |
| | Residential; institutional; educational areas | | | | | | **55** | **45** | - | - | - | **55** | **45** | - | - | - | **3** | **3** | - | - | - |
| Turkish Noise Limit Values[3,4] | Industrial facilities, transportation sources | | | | | | - | - | **65** | **60** | **55** | - | - | **65** | **60** | **55** | - | - | - | - | - |

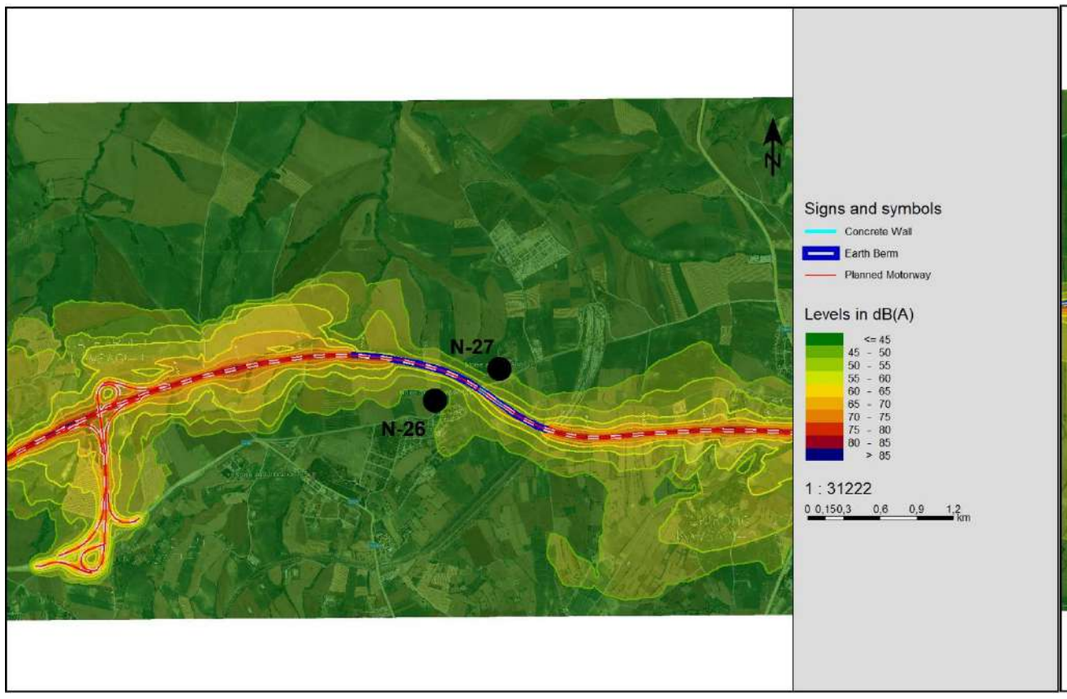
**Notes:**
* Noise abatement measure features given in the table are indicative features digitized in the noise modelling studies. Detailed design studies are required for the definitive technical features of the noise abatement measures.
[1] IFC Environmental, Health, and Safety (EHS) Guidelines General EHS Guidelines: Environmental - Noise Management;
[2] IFC Guidelines provide noise standards for two-time intervals in 24 hours: day (07:00 to 22:00), and night (22:00 to 07:00).
[3] Regulation on Control of Environmental Noise;
[4] Regulation on Control of Environmental Noise provides noise standards for three-time intervals in 24 hours: day (07:00 to 19:00), evening (19:00 to 23:00) and night (23:00 to 07:00).

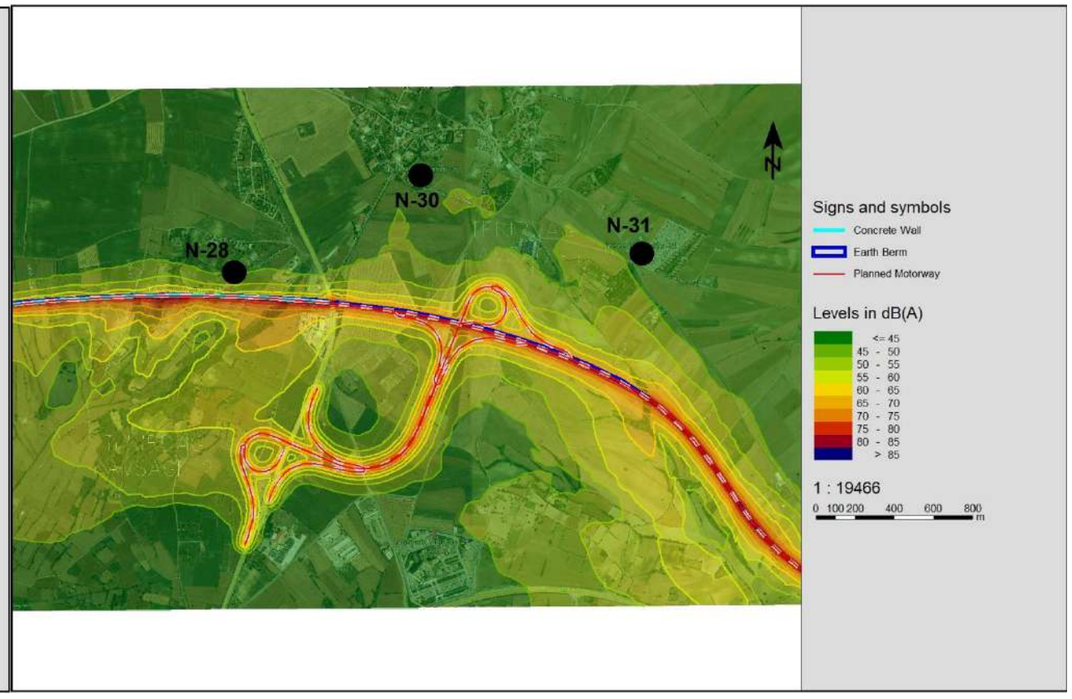

N-5
N
Signs and symbols
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14220
0 50100 200 300 400 m

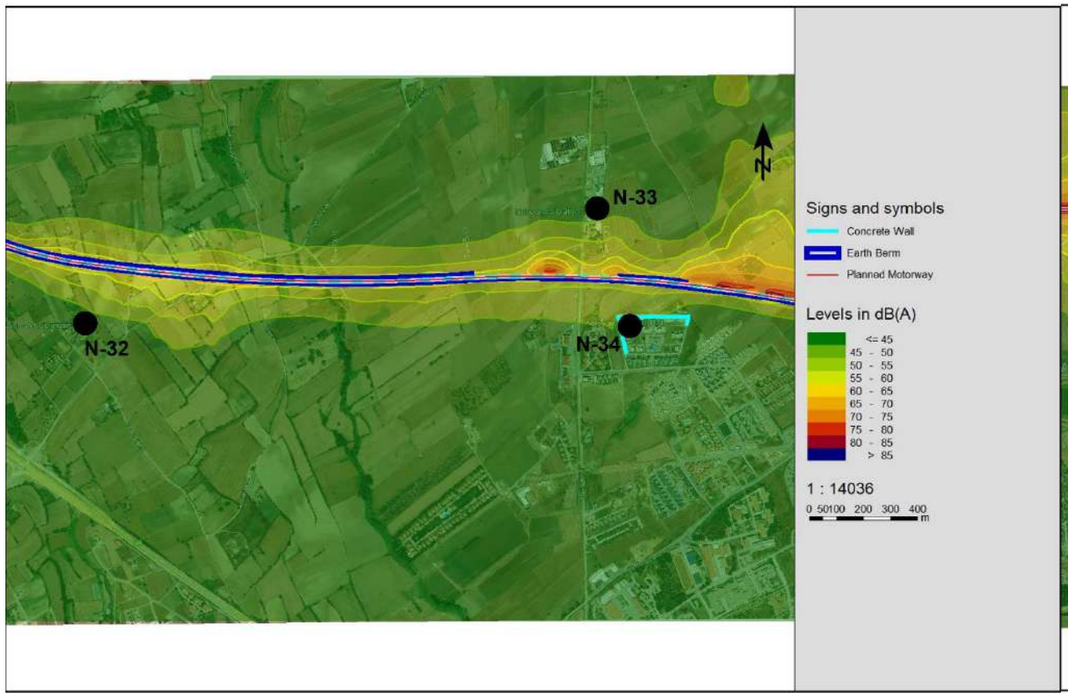

N-9
N
Signs and symbols
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14577
0 50100 200 300 400 m


N-11
N
Signs and symbols
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 16193
0 100 200 400 600 800 m

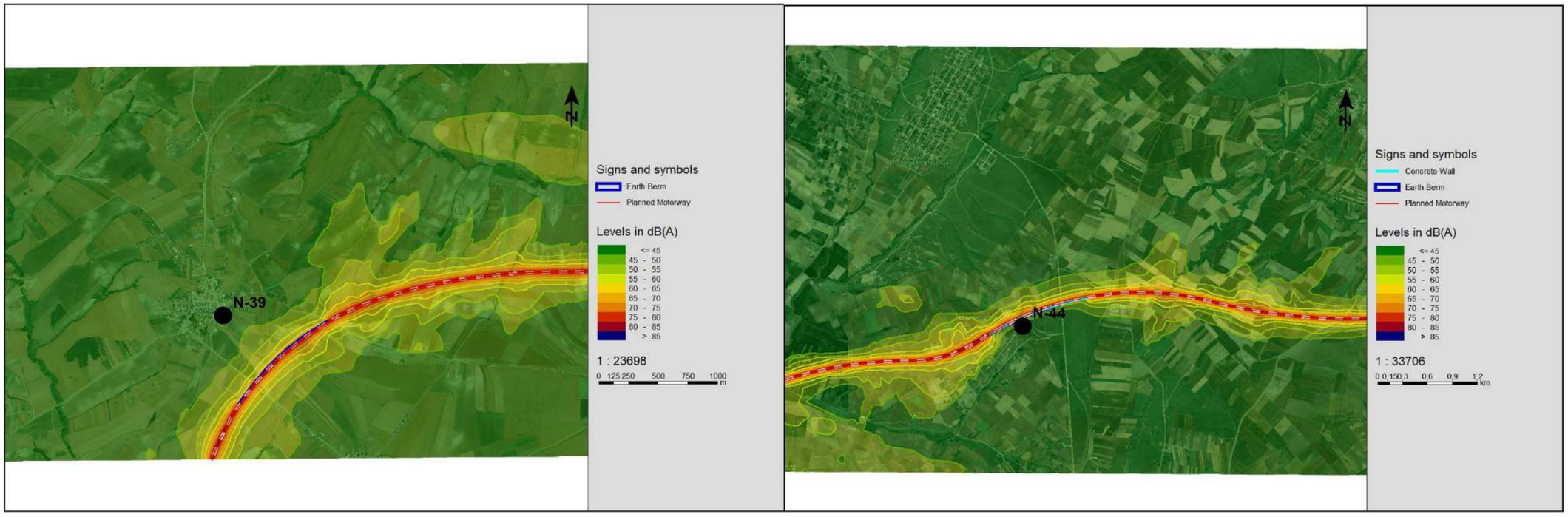

N-16
N
Signs and symbols
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 13282
0 50100 200 300 400 m

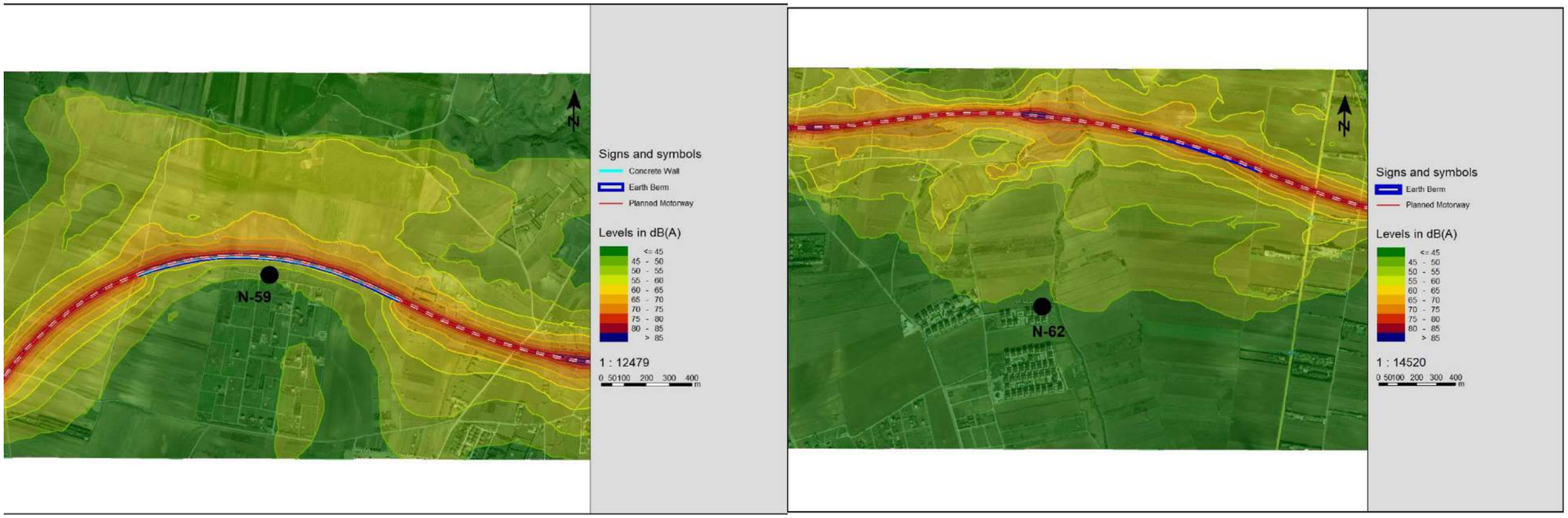

N-26
N-27
Signs and symbols
Concrete Wall
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 31222
0 0.150.3 0.6 0.9 1.2 km


N-28
N-30
N-31
Signs and symbols
Concrete Wall
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 19466
0 100 200 400 600 800 m


N-32
N-33
N-34
Signs and symbols
Concrete Wall
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 14036
0 50100 200 300 400 m


N-37
Signs and symbols
Concrete Wall
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 16644
0 100 200 400 600 800 m


N-39
N
Signs and symbols
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 23698
0 125 250 500 750 1000 m
N-44
N
Signs and symbols
Concrete Wall
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 33706
0 0,15 0,3 0,6 0,9 1,2 km
N-47
N-51
N
Signs and symbols
Concrete Wall
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 28917
0 125 250 500 750 1000 m
N-52
N
Signs and symbols
Earth Berm
Planned Motorway
Levels in dB(A)
<= 45
45 - 50
50 - 55
55 - 60
60 - 65
65 - 70
70 - 75
75 - 80
80 - 85
> 85
1 : 32923
0 0,15 0,3 0,6 0,9 1,2 km



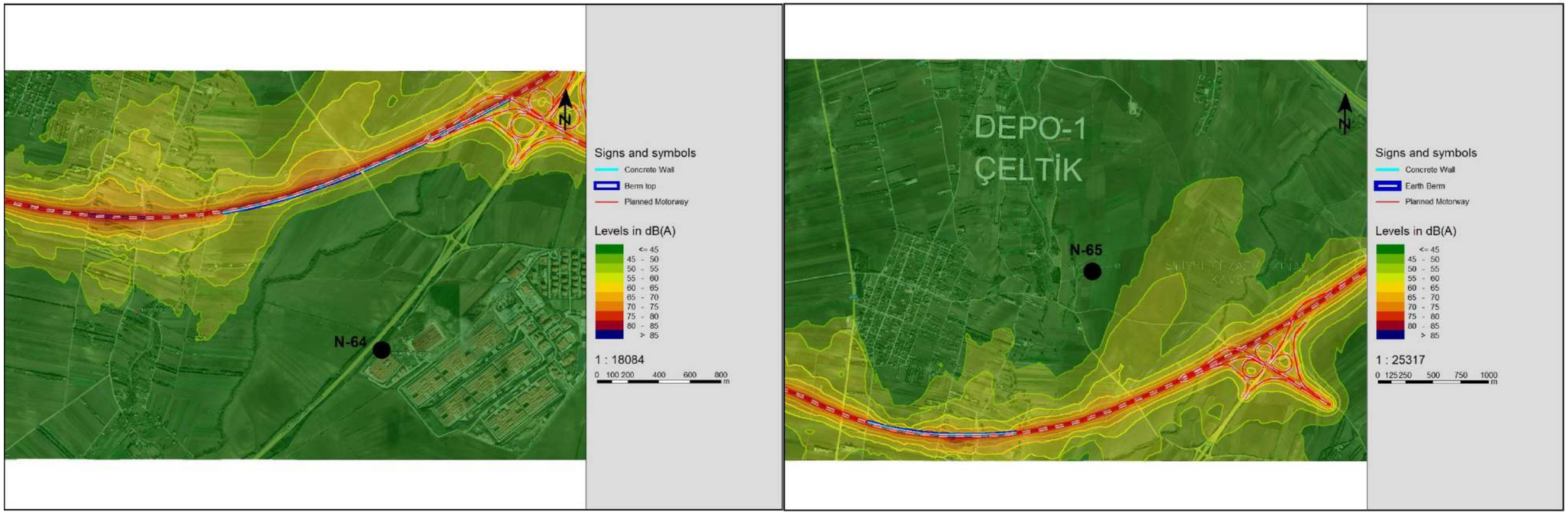




**Figure 240: Daytime Grid Noise Maps for the Operational Phase with Implementation of Noise Abatement Measures**

### *7.1.9.5 Residual Impacts*

#### 7.1.9.5.1 Construction Phase

Noise impacts for the construction phase of the Project are evaluated in the matrix provided in Table 219. As can be seen in the matrix, the impact factor considered for noise originated from construction activities have **low** residual impacts on the nearby communities, after the implementation of mitigation measures.

**Table 219: Noise Impact Matrix for Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation Effectiveness | Residual Impact Value |
|---|---|---|---|---|---|---|---|
| Emission of Noise | Duration: | Medium | Very high | Short-term | **Low** | Medium | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Very high | | | | | |

#### 7.1.9.5.2 Operation Phase

Noise impacts for the operation phase of the Project are evaluated in the matrix provided in Table 220. As can be seen in the matrix, the impact factor considered for noise impact originated from operational activities have **low** residual impacts on the nearby communities, after the implementation of the mentioned mitigation measures.

However, it should be noted that the modelling studies conducted for the implementation of noise abatement measures are intended to be indicative and should not be the sole basis for the final design of these measures. Accordingly, a detailed noise modelling studies which includes long term noise measurement studies, are recommended to be conducted for determination of the design details and locations of the noise abatement measures during the superstructure design phase. Based on that, noise abatement measures will be installed/established prior to the operation phase of the Project, in order to ensure that noise emissions resulting from the vehicles passing through the motorway are properly mitigated and residual noise levels are below the limit values.

**Table 220: Noise Impact Matrix for Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation Effectiveness | Residual Impact Value |
|---|---|---|---|---|---|---|---|
| Emission of Noise | Duration: | Very long | Very high | Long term | **Very High** | Medium high | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |

#### 7.1.9.5.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction and operation phases in the decommissioning and closure phase (after the mitigation) of the Project.

#### 7.1.9.6 Monitoring

During the construction and operation phases of the Project, a monitoring programme of noise at the selected baseline noise measurement[201] locations and at the receptors where the defined noise limit values are exceeded, will be in place. The monitoring campaign will be conducted by 48 hours continuous noise measurements at the locations on quarterly basis.

### 7.1.10 Vibration

The Project has the potential to generate vibration during the construction phase due to the construction activities and blasting activities (in the quarries, there will be no blasting planned for the motorway construction), and during the operation phase due to the vehicles passing through the motorway. This section aims to assess impacts of vibration on the closest sensitive areas.

Additionally, sensitive receptors of the Project were identified through satellite images and interviews with the mukhtars of nearby settlements and local community members during the social baseline field studies and presented in the Section 5.0. Mosques, schools, cemeteries, and hospitals were defined as sensitive receptors. These receptors within a 1 km buffer zone on both sides of the route (a total of 2 km) were thoroughly scanned along the entire route. During the assessment of vibration impacts, the identified sensitive receptors were also taken into account.

The vibration impacts are assessed in the Project AoI which includes potentially affected settlements and sensitive environmental features. During impact assessment, the Project actions and impact factors defined in Methodology Section are considered, and the mitigation and management measures are defined in this Section. As detailed below, the main approach to impact analysis is based on the calculations of predicted vibration impacts during the construction and operation phases of the Project.

Vibration impact assessment in the scope of the Project has been conducted regarding the Turkish limits provided in the Regulation on Control of Environmental Noise, which are listed in Table 221, Table 222 and Table 223. It should be noted that there is no numerical limit or guideline in the IFC guidelines in terms of the blasting activities.

**Table 221: The Maximum Allowable Values of Ground Vibrations to be Created by Vibrations That Will Occur Due to Blasting in Mines, Quarries and Similar Areas**

| Structure Type | | Highest Vibration Rate at Foundation of Buildings, (mm/s) (based on frequency, f=Hz) | | | On the floor (base) of the top floor for all frequencies (mm/s) |
|---|---|---|---|---|---|
| | | f= 1-10 | f=10-50 | f=50-100 | |
| 1 | Industrial buildings | 20 | 40 | 50 | 40 |
| 2 | Durable structures such as houses, brick and concrete | 5 | 15 | 20 | 15 |

[201] When determining monitoring points, locations with active construction work, associated facilities in active operation and proximity to residential areas will be taken into consideration.

| Structure Type | | Highest Vibration Rate at Foundation of Buildings, (mm/s) (based on frequency, f=Hz) | | | On the floor (base) of the top floor for all frequencies (mm/s) |
|---|---|---|---|---|---|
| | | f= 1-10 | f=10-50 | f=50-100 | |
| 3 | Buildings, historical and natural structures that are vibration sensitive and excluded from the 1st and 2nd clauses | 2 | 8 | 10 | 8 |

**Table 222: The Highest Allowable Values of Ground Vibrations to be Generated by Railway and Road Transportation Vehicles, Workplaces and Industrial Facilities in the Nearest Structure and Ground Vibrations to be Generated by Machinery and Equipment Inside the Building**

| Structures | Vibration Frequency (Hz) | Maximum Permissible Vibration Rate (rms value (mm/s)) |
|---|---|---|
| In Residences | 1 | 1.5 |
| | 8-100 | 0.3 |
| In Offices | 1 | 3.5 |
| | 8-100 | 0.6 |
| In Historical and Natural Structures | 1 | 0.8 |
| | 8-100 | 0.1 |

**Table 223: The Highest Allowable Values of Ground Vibrations That Will Be Generated by Piling and Similar Vibration-Generating Operations in Constructions, and Outside the Nearest Structure by Construction Machinery (In Frequency Bands Between 1 Hz and 80 Hz)**

| Locations | Maximum Permissible Vibration Rate (Peak Value-mm/s) | |
|---|---|---|
| | Continuous Vibration | Discontinuous Vibration |
| Residential Areas | 5 | 10 |
| Commercial Areas | 15 | 30 |
| Historical and Natural Structures | 2 | 5 |

### *7.1.10.1 Impact Analysis*

#### 7.1.10.1.1 Construction Phase

#### Construction Activities

During the construction phase of the Project, vibration is expected to be generated as a result of construction activities (vibratory compaction, heavy vehicles passing through the roads, etc.).

Vibration calculations for the construction activities have been performed using the general vibration assessment procedure defined in the Transit Noise and Vibration Impact Assessment Manual published by the Federal Transit Administration (FTA)[202].

1) Within the manual, average source levels for various types of construction equipment measured under a wide variety of construction activities for a wide range of soil conditions, at a reference distance of 25 ft distance, have been presented. Within this regard, the average source levels of the Project machinery and equipment are given in Table 224:

**Table 224: Vibration Source Levels for Construction Equipment**

| Equipment | PPV at 25 ft, in/sec |
|---|---|
| Pile Driver (impact) | 0.644 |
| Vibratory Roller | 0.210 |
| Hoe Ram | 0.089 |
| Large Bulldozer | 0.089 |
| Caisson Drilling | 0.089 |
| Loaded Trucks | 0.076 |
| Jackhammer | 0.035 |
| Small Bulldozer | 0.003 |

2) Based on that, source reference levels were adjusted to distance from the equipment to the receiver by the below given formula:

$$PPV_{equip} = PPV_{ref} * \left(\frac{25}{D}\right)^{1.5}$$

Where;

*$PPV_{equip}$: the peak particle velocity of the equipment adjusted for distance, in/sec*

*$PPV_{ref}$: the source reference vibration level at 25 ft, in/sec*

*D: distance from the equipment to the receiver, ft*

3) Finally, the adjusted values are converted from in/sec to mm/s and the expected vibration levels with respect to distance is obtained as shown in below:

[202] Federal Transit Administration (2018), Transit Noise and Vibration Impact Assessment Manual.

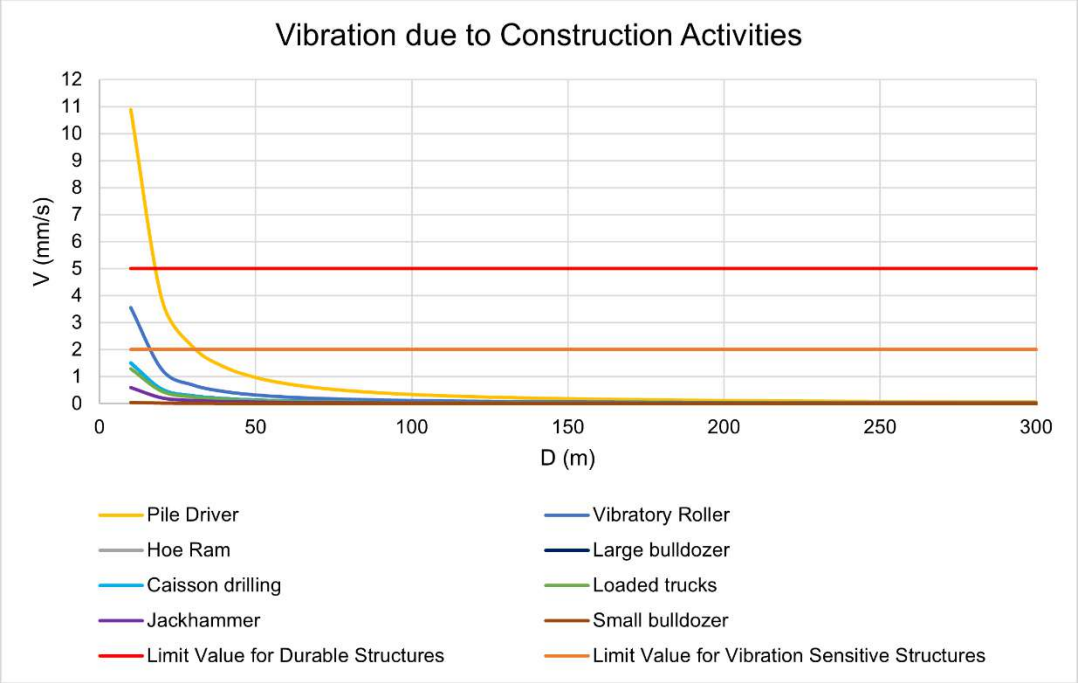



**Figure 241: Distribution of Vibration Resulting from the Construction Activities**

As it is seen from the adjusted vibration curve in above, the vibration caused by the construction activities remain under the regulatory limit values of 5 mm/s and 2 mm/s at all distances, except for the pile driver and vibratory roller. However, vibration caused by the pile driver which has the highest vibration impact, is attenuated to below regulatory limit values of 5 mm/s and 2 mm/s at distances of 17 m and 31 m, respectively.

In terms of durable structures, since there will be no receptors closer than 17 m to the construction sites, no vibration effect is expected due to the construction activities.

On the other hand, in terms of receptors potentially sensitive to vibration (e.g. hospitals, etc.), since the nearest of these receptors is located in 560 m away from the construction sites, no vibration effect is expected due to the construction activities.

However, in terms of vibration sensitive structures of HRM-7, HRM-18, HRM-19, HRM-21, HRM-23, HRM-30, HRM-38, HRM-39 and HRM-40, limit value of 2 mm/s is expected to be exceeded due to the construction activities (please refer to Section 7.3 for the details of these findings codes).

### Blasting Activities

During the construction phase of the Project, blasting activities will take place in quarries.

During the vibration assessment, the general form of the blast-induced ground vibration estimation formula given below was used. This formula was obtained as a result of thousands of measurements, monitoring and statistical

analyses made both in the USA and in other countries according to the “Blaster’s Handbook”[203] published by International Society of Explosives Engineers (ISEE).

$$PPV = k * \left(\frac{D}{\sqrt{W}}\right)^{-1.6}$$

Where;

*PPV: Peak particle velocity (mm/s)*

*k: Ground vibration transmissibility coefficient*

*D: Distance between the blasting point (m)*

*W: Weight of explosives per delay (kg)*

Based on the above given formula, regardless of the amount of explosive material to be used at one time, vibration impact of the blasting activities will be related to the amount to be detonated in each hole.

### *Blasting Activities at Quarries*

Blasting activities will take place with millisecond-delayed capsules at the quarries where the filling materials will be obtained.

For the Muratlı, Osmanlı, Tepeköy, Dereköy and 68+000 Quarries, holes will be drilled at the areas where blasting activities will be carried out, with a maximum diameter of 89 mm with 2.28 m hole intervals. Maximum of 59.18 kg of explosive (ANFO + dynamite) will be placed in each hole and detonation will be carried out by taking safety precautions as a result of capsule connections.

Considering the maximum amount of explosive to be used in each hole during the blasting activities at these quarries which is 59.18 kg, the following graph is obtained using the equation above. It is calculated that the vibration levels resulting from blasting activities for these quarries go below the limits of 5 mm/s and 2 mm/s after distances of 298 m and 530 m, respectively.

[203] International Society of Explosives Engineers. (2011). ISEE blasters' handbook. Cleveland, Ohio: International Society of Explosives Engineers.

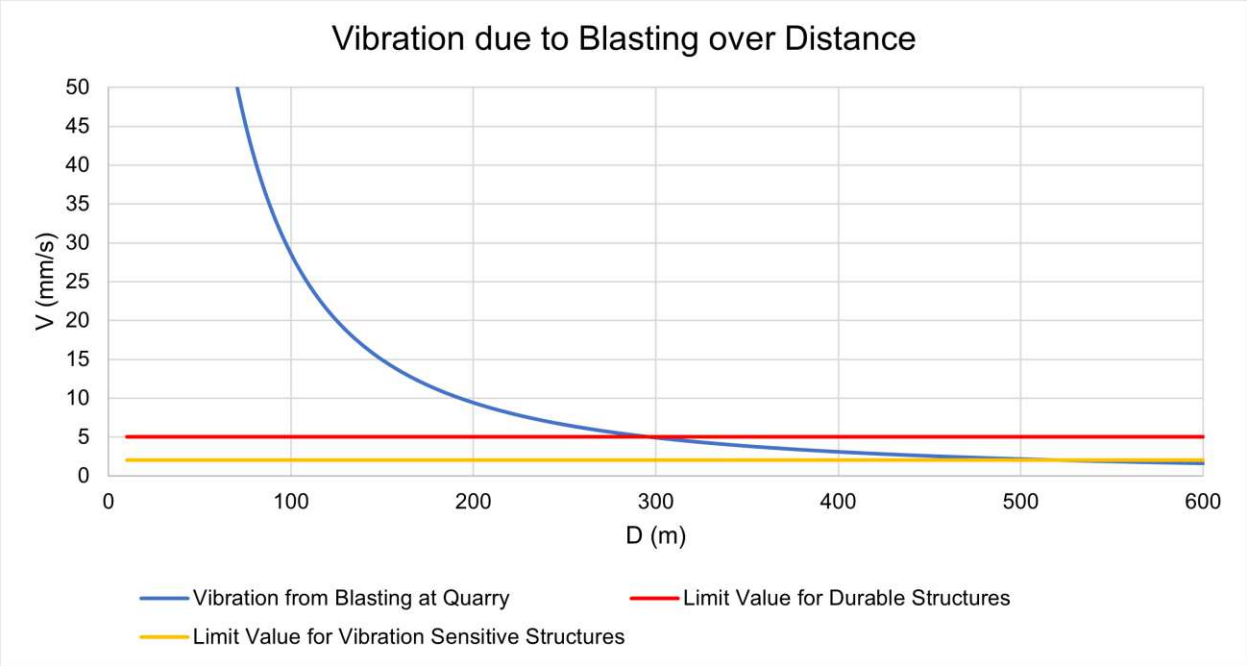



**Figure 242: Distribution of Vibration Resulting from the Blasting Activities at Muratlı, Osmanlı, Tepeköy, Dereköy and 68+000 Quarries**

For the Danamandıra Quarry, holes will be drilled at the areas where blasting activities will be carried out, with a maximum diameter of 89 mm with 2.35 m hole intervals. Maximum of 47.97 kg of explosive (ANFO + dynamite) will be placed in each hole and detonation will be carried out by taking safety precautions as a result of capsule connections.

Considering the maximum amount of explosive to be used in each hole during the blasting activities at Danamandıra Quarry which is 47.97 kg, the following graph is obtained using the equation above. It is calculated that the vibration levels resulting from blasting activities for Danamandıra Quarry go below the limits of 5 mm/s and 2 mm/s after distances of 268 m and 475 m, respectively.

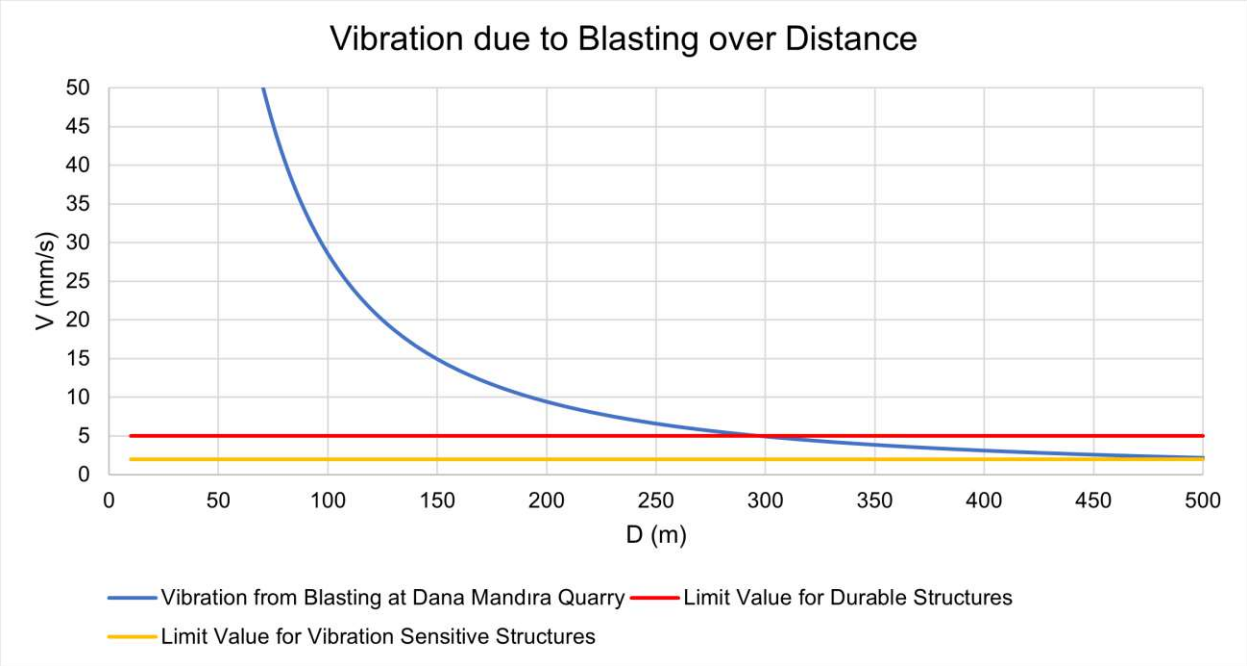



**Figure 243: Distribution of Vibration Resulting from the Blasting Activities at Danamandıra Quarry**

The locations of the vibration sources (i.e, where the blasting activities will be carried out), the distance of the nearest receptor to the vibration source, and the calculated vibration values on these receptors are presented in Table 225.

Based on the calculations, vibration levels due to the blasting activities are within the associated limit value defined in the Turkish Regulation except for the nearest sensitive receptor to Danamandıra Quarry.

In terms of receptors potentially sensitive to vibration (e.g. hospitals, etc.), since the nearest of these receptors is located in 6,700 m away from the nearest quarry, no vibration effect is expected due to the blasting activities.

**Table 225: Calculated Vibration Levels on the Nearest Receptors during the Construction Phase**

| Vibration Source | Blasting Location | Distance to the Nearest Receptor (m) | Settlement Name | W (kg) | V (mm/s) | Exceedance of the Limit (i.e. 5 mm/s) |
|---|---|---|---|---|---|---|
| Quarry | Danamandıra Quarry | 40 | Danamandıra | 47.97 | 104.60 | 99.60 |
| | Muratlı Quarry | 320 | Muratlı | 59.18 | 4.44 | - |
| | 68+000 Quarry | 1,200 | Yağcı | 59.18 | 0.54 | - |
| | Osmanlı Quarry | 550 | Osmanlı | 59.18 | 1.87 | - |

| Vibration Source | Blasting Location | Distance to the Nearest Receptor (m) | Settlement Name | W (kg) | V (mm/s) | Exceedance of the Limit (i.e. 5 mm/s) |
|---|---|---|---|---|---|---|
| | Dereköy Quarry | 390 | Dereköy | 59.18 | 3.24 | - |
| | Tepeköy Quarry | 800 | Çengelli | 59.18 | 1.03 | - |

Additionally, the locations of the vibration sources (i.e, where the blasting activities will be carried out), the distance to the nearest vibration sensitive structure (i.e. cultural heritage site) to the vibration source, and the calculated vibration values on these structures are presented in Table 226.

Vibration levels due to the blasting activities at most of the locations are within the associated limit value defined in the Turkish Regulation. Within this respect, it is expected that blasting activities will only have a vibration impact on the structures close to the 68+000 Quarry and Dereköy Quarry.

**Table 226: Calculated Vibration Levels on the Nearest Vibration Sensitive Structure during the Construction Phase**

| Vibration Source | Blasting Location | Distance to the Nearest Vibration Sensitive Structure (m) | Settlement Name | W (kg) | V (mm/s) | Exceedance of the Limit (i.e. 2 mm/s) |
|---|---|---|---|---|---|---|
| Quarry | Danamandıra Quarry | 2,100 | Danamandıra | 47.97 | 0.19 | - |
| | Muratlı Quarry | N/A* | - | 59.18 | - | - |
| | 68+000 Quarry | 110 | Yağcı | 59.18 | 24.52 | 22.52 |
| | Osmanlı Quarry | 2,000 | Osmanlı | 59.18 | 0.24 | - |
| | Dereköy Quarry | 205 | Dereköy | 59.18 | 9.05 | 7.05 |
| | Tepeköy Quarry | N/A* | - | 59.18 | - | - |

*Refers that nearest structure is too far away to provide a calculation

#### 7.1.10.1.2 Operation Phase

During the operation phase, no blasting activity will be carried out, the only potential vibration source will be the vehicles passing through the motorway.

Vibration calculations for vehicles passing through the motorway in the Project, have been performed using the general vibration assessment procedure defined in the Transit Noise and Vibration Impact Assessment Manual published by the Federal Transit Administration (FTA)[204].

According to the procedure defined in the FTA manual, the basic approach for the vibration assessment is to define a curve that predicts the overall ground-borne vibration as a function of distance from the source, then to apply adjustments to these curves to account for factors such as vehicle speed, geologic conditions, building type, and receiver location within the building.

1) As a first step for the vibration assessment, the first curve in below figure for “Rubber-Tired Vehicles” with 30 mph is selected since rubber-tired vehicles will use the motorway in the operation phase of the Project.

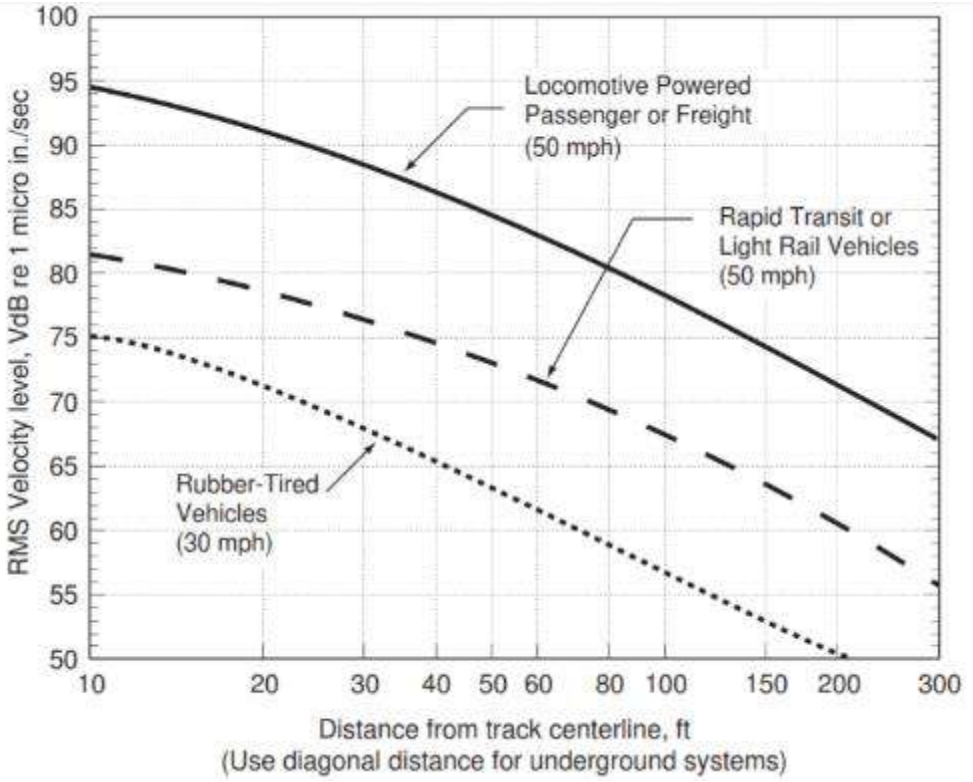



**Figure 244: Ground Surface Vibration Curves**

2) Then, the selected RMS levels are adjusted using the average speeds of the light motor vehicles, medium heavy vehicles, heavy vehicles and powered two-wheelers on the motorway which are taken as 140 km/hr, 100 km/hr, 90 km/hr and 100 km/hr, respectively, as per the Turkish Highway Traffic Law:

$$140\ \text{kph} \approx 86.99\ \text{mph} \qquad 20\log\left(\frac{86.99\text{mph}}{30\ mph}\right) = +9.25\ VdB$$

[204] Federal Transit Administration (2018), Transit Noise and Vibration Impact Assessment Manual.

$$100 \text{ kph} \approx 62.14 \text{ mph} \qquad 20 \log\left(\frac{62.14 \text{mph}}{30\ mph}\right) = +6.33\ VdB$$

$$90 \text{ kph} \approx 55.92 \text{ mph} \qquad 20 \log\left(\frac{55.92 \text{mph}}{30\ mph}\right) = +5.41\ VdB$$

3) Finally, the curve is recalculated including the highest vehicle speed factor (i.e. average speed of the light motor vehicles) and the expected vibration levels with respect to distance is shown in below:

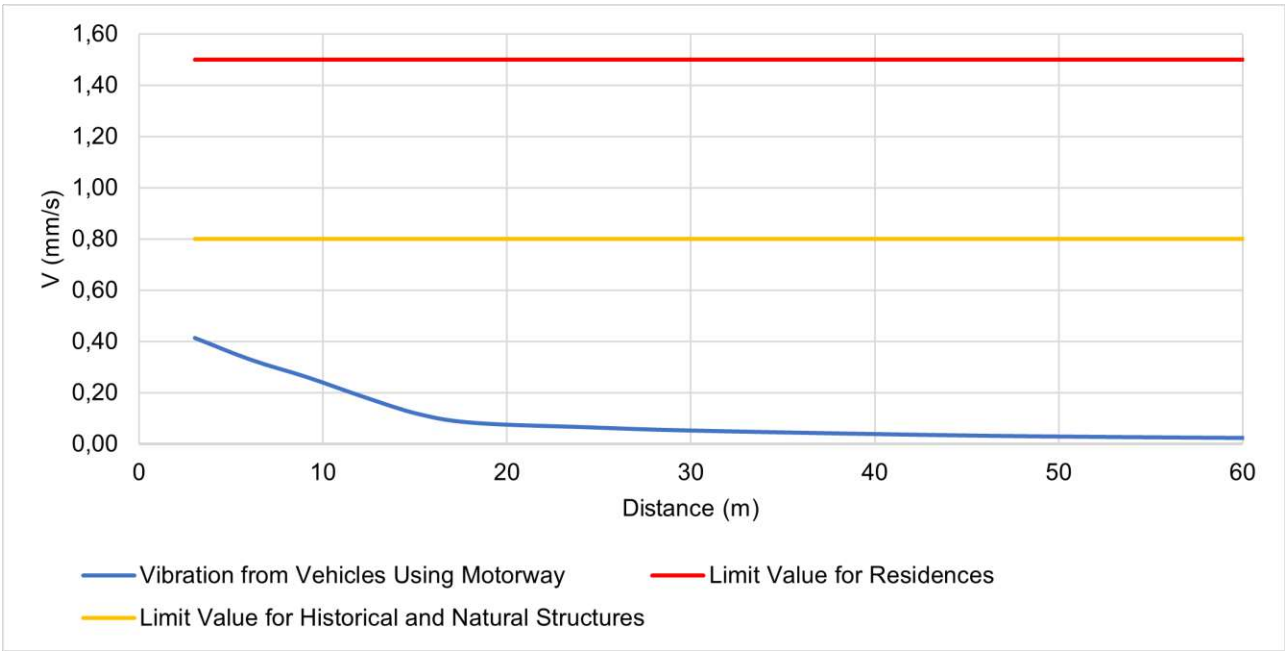



**Figure 245: Distribution of Vibration Resulting from the Vehicles Using the Motorway**

As it is seen from the adjusted vibration curve in above, the vibration caused by the vehicles passing through the motorway will remain under the limit values of 1.5 mm/s and 0.8 mm/s, at all distances. Therefore, no vibration effect is expected due to the vehicles passing through the motorway.

In terms of receptors potentially sensitive to vibration (e.g. hospitals, etc.), since the nearest of these receptors is located in 560 m away from the motorway route, no vibration effect is expected due to the vehicles passing through the motorway.

#### 7.1.10.1.3 Decommissioning and Closure Phase

During the decommissioning and closure phase, no blasting activity will take place, therefore no vibration impact is expected resulting from the Project activities.

### *7.1.10.2 Mitigation Measures*

The mitigation measures listed below will be implemented especially for the blasting activities during the construction phase.

All blasting activities which will be carried out in Muratlı, Osmanlı, Tepeköy, Dereköy and 68+000 Quarries, with current pattern, will be carried out at least 298 m away from receptors/settlements.

In terms of vibration sensitive structures (i.e. cultural heritage site), blasting activities which will be carried out in Muratlı, Osmanlı and Tepeköy Quarries, with current pattern, will be carried out at least 530 m away from these structures. While for the Danamandıra Quarry, blasting activities which will be carried out with current pattern, will be carried out at least 475 m away from these structures.

If blasting activities will be carried out at a location closer than this distance, blasting pattern and explosive quantities will be optimized to be in line with the vibration effect as below the 5 mm/s at the sensitive receptors and as below the 2 mm/s at the vibration sensitive structures.

- Proper and timely communication and information exchange between the Client/Contractor and residents, are essential to prevent unnecessary concerns. Therefore, residents will be informed about the proposed blasting times and/or any deviation from this programme.
- Construction and blasting activities will be scheduled to minimise potential vibration related impacts.
- Prior to the construction phase, consultation with the Museum Directorate will be carried out for the locations HRM-7, HRM-18, HRM-19, HRM-21, HRM-23, HRM-30, HRM-38, HRM-39 and HRM-40 where vibration impact is expected to exceed the regulatory limit values due to the construction activities. Based on the results of consultation, measures to be identified will be taken prior to any construction activity at these areas.
- During the blasting activities, vibration measurement studies will be performed for frequency ranges on the closest receptors and vibration sensitive structures to the blasting locations. Within this regard, the nearest receptors and vibration sensitive structures to the blasting locations will be identified at the site prior to the blasting activities.
- Baseline surveys of existing structure and integrity at structures close to the blasting sites will be undertaken so that impacts and any damage arising from blasting activities will be identified during the periodic monitoring studies.
- Maintenance of the motorway will be carried out regularly to reduce the roughness of running surfaces, so the vibration levels are minimized.

For the Dereköy, 68+000 and Danamandıra Quarries where blasting activities will have vibration impacts on the closest receptors or vibration sensitive structures and vibration limit values defined in the Turkish regulatory requirements are expected to be exceeded during the blasting activities, following mitigation measures based on the optimization of blasting patterns defined in the Table 227 will be implemented. Based on the changes in the blasting patterns, residual vibration impacts on the closest receptors and sensitive structures resulting from the blasting activities will be in line with the regulatory limit values.

**Table 227: Calculated Vibration Levels on the Nearest Receptors and Vibration Sensitive Structures during the Blasting Activities at Dereköy, 68+000 and Danamandıra Quarries with the Implementation of Mitigation Measures**

| Prior to the Implementation of the Mitigation Measures | | | | | | | | Mitigation Measures (Changes in Blasting Patterns) | | Estimated Vibration Impacts on the Nearest Receptors / Structures with the Implementation of Mitigation Measures | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vibration Source | Blasting Location | Distance to the Nearest Receptor /Structure (m) | Settlement Name | Blasting Pattern | | Vibration Value in the Nearest Receptor / Structure (V) (mm/s) | Exceedance of the Vibration Limit (i.e. 5 mm/s or 2 mm/s) | Maximum Hole Diameter (mm) | W (kg) | V (mm/s) | Exceedance of the Vibration Limit (i.e. 5 mm/s or 2mm/s) |
| | | | | Maximum Hole Diameter (mm) | W (kg) | | | | | | |
| Quarry | Danamandıra Quarry | 40 | Danamandıra | 89 | 47.97 | 104.60 | 99.60 | 89 | 1.05 | 4.92 | - |
| | 68+000 Quarry | 110 | Yağcı | 89 | 59.18 | 24.52 | 22.52 | 89 | 2.55 | 1.98 | - |
| | Dereköy Quarry | 205 | Dereköy | 89 | 59.18 | 9.05 | 7.05 | 89 | 8.90 | 1.99 | - |

### *7.1.10.3 Residual Impacts*

#### 7.1.10.3.1 Construction Phase

Vibration impacts for the construction phase of the Project due to the blasting activities are evaluated in the matrix provided in Table 228. As can be seen in the matrix, the impact factor defined for vibration originated from construction activities has **negligible** residual impacts on the nearby communities/structures.

**Table 228: Vibration Impact Matrix for Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation Effectiveness | Residual Impact Value |
|---|---|---|---|---|---|---|---|
| Emission of Vibration | Duration: | Medium | Very high | Mid-term | **High** | High | **Low** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Very high | | | | | |

#### 7.1.10.3.2 Operation Phase

Vibration impacts for the operation phase of the Project due to the vehicles passing through the motorway are evaluated in the matrix provided in Table 229. As can be seen in the matrix, the impact factor considered for vibration originated from the operation phase activities has **low** residual impact on the nearby residential areas/structures.

**Table 229: Vibration Impact Matrix for Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation Effectiveness | Residual Impact Value |
|---|---|---|---|---|---|---|---|
| Emission of Vibration | Duration: | Very long | Very high | Long term | **High** | High | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Project site | | | | | |
| | Intensity: | Negligible | | | | | |

#### 7.1.10.3.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction and operation phases in the decommissioning and closure phase of the Project.

### *7.1.10.4 Monitoring*

During the blasting activities, vibration measurement studies will be performed for frequency ranges on the closest receptors or vibration sensitive structures to the blasting locations. Surveys of existing structure and integrity at structures close to the blasting sites will be undertaken both prior to any blasting activity and monthly during the construction phase.

In addition, during the construction and operation phases of the Project, in case of any vibration related grievance, vibration measurement campaign will be carried out immediately at the area where vibration related grievance is received.

## 7.1.11 Traffic

### *7.1.11.1 Impact Analysis*

#### 7.1.11.1.1 Construction Phase

During the construction phase, impacts on the traffic component will be mainly associated to the following ***impact factors:***

- increase in vehicular traffic, and
- interruption of the roads, and limitation of traffic.

The activities related to the construction phase will require the movement of trucks entering and leaving the Project area for the transportation of machinery, equipment, construction material (e.g., concrete, building materials) and staff. During transportation, existing roads will be used. Based on that, predicted increase in the traffic loads in the regions where Project Route passing through are given in below.

**Table 230: Traffic Load Increase during the Construction Phase**

| Interchanges | Estimated Traffic Load at the Existing Situation (vehicle/day) | Number of Vehicle Increase with the Project's Construction (vehicle/day) | Traffic Load Increase (%) |
|---|---|---|---|
| Silivri Prison + Kınalı Interchange | 30,343 | 855 | 2.82 |

| Interchanges | Estimated Traffic Load at the Existing Situation (vehicle/day) | Number of Vehicle Increase with the Project's Construction (vehicle/day) | Traffic Load Increase (%) |
|---|---|---|---|
| Çanta Interchange-2 | 9,672 | | 8.83 |
| Marmara Ereğlisi Interchange-2 | 5,213 | | 16.4 |
| Çorlu Airport Interchange | 17,021 | | 5.02 |
| Tekirdağ East Interchange-2 | 29,663 | | 2.88 |
| Tekirdağ Interchange-2 | 30,907 | | 2.77 |
| Hayrabolu Interchange-2 | 4,527 | | 18.87 |
| Tekirdağ West Interchange-2 | 16,415 | | 5.21 |

During the construction phase, the Project's vehicles will not be on the road at the same time. However, in the worst-case scenario, it is assumed that the vehicles will all be on the road at the same time. Based on that, during the construction phase 2.82, 8.83, 16.4, 5.02, 2.88, 2.77, 18.87 and 5.21 increases on the daily traffic loads could be expected on the existing state roads connected with Silivri Prison + Kınalı Interchange, Çanta Interchange-2, Marmara Ereğlisi Interchange-2, Çorlu Airport Interchange, Tekirdağ East Interchange-2, Tekirdağ Interchange-2, Hayrabolu Interchange-2, and Tekirdağ West Interchange-2, respectively. It should be noted that since the assessment is based on the maximum traffic load increases at worst-case scenario, the increase in road traffic will be much lower than the values given in the table above in most of the time during a daily period.

Some of the access roads to be used within the scope of the Project, are already exist. However, at this stage of the Project, the access roads to be used to provide transportation to all Project associated facilities and components are not certain yet. Geometries of these roads were also assessed in terms of heavy goods vehicle movements during the route selection stage. In the existing access road, road construction is not expected but some extension or rehabilitation works might be performed in case of need.

Within this regard, expected impacts of the traffic load during the construction phase can be listed as below:

- Increase in traffic load will cause an increase in the noise along the access roads to the construction sites,
- Increase in traffic load, interruption of roads and limitation to traffic will take place during construction activities and road closures,
- High speed of heavy vehicles is a concern for local communities,
- Increased road traffic could lead to accidental wildlife losses, and
- Usage of existing roads can cause damage on the roads due to heavy vehicles.

Detailed assessment of the impacts of traffic load on community health and safety was conducted in Section 7.3 Social Impact Assessment.

#### 7.1.11.1.2 Operation Phase

During the operation phase impacts will be mainly associated to the impact factor of decreased traffic load in lower standard roads. After constructing the Motorway, part of the traffic will stay on the existing roads and other part will be on the new motorway sections. According to traffic projection study of the Project, annual mean daily traffic load is presented in Table 231. Illustration of vehicle classifications is also shown in Figure 246.

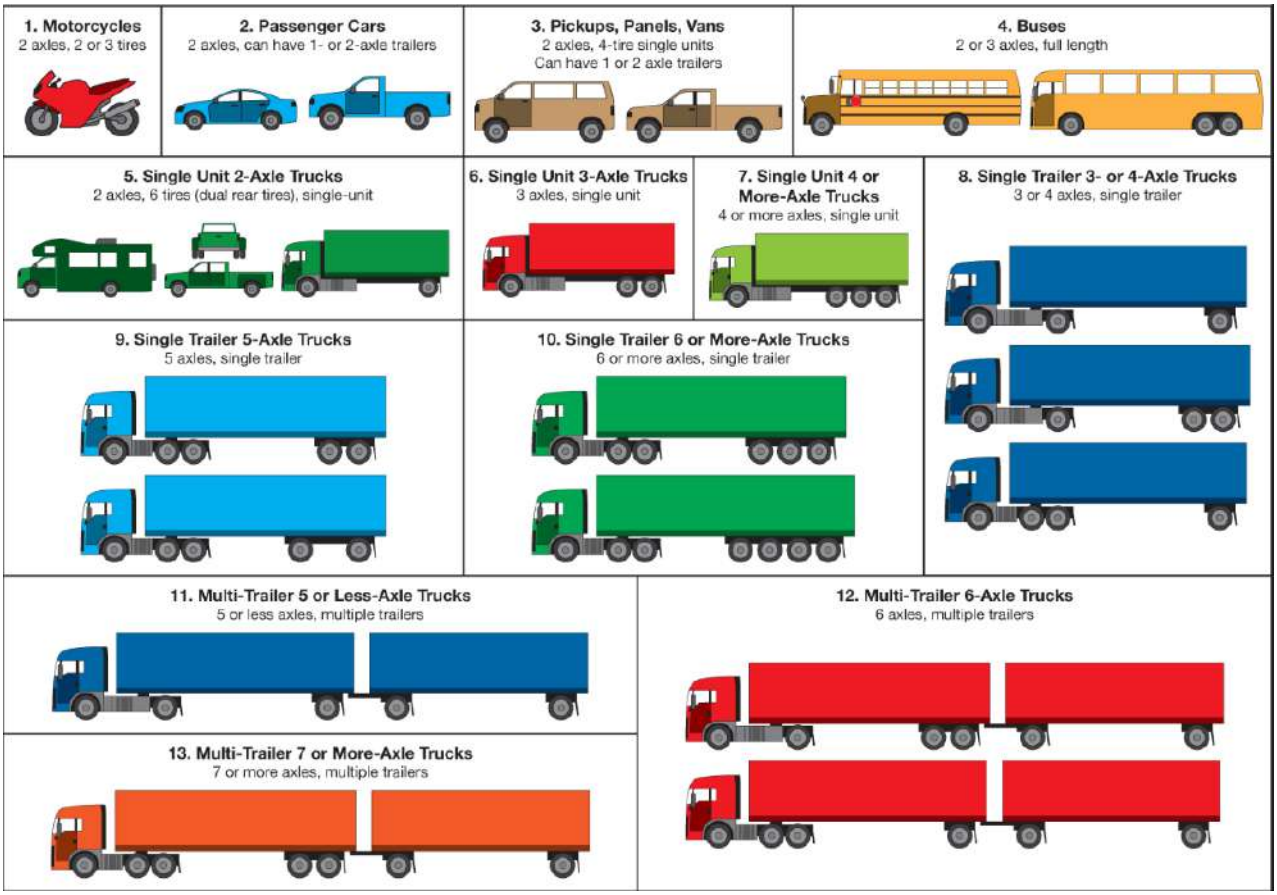



**Figure 246: Vehicle Classifications**

**Table 231: Annual Daily Traffic Load (traffic projection study)**

| | Number of Vehicle | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type of Vehicle** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** | **2031** | **2032** | **2033** | **2034** | **2035** | **2036** | **2037** | **2038** | **2039** | **2040** |
| Car | 5,764 | 7,903 | 11,247 | 12,395 | 15.047 | 16,323 | 17,599 | 18,874 | 20,150 | 21,425 | 22,135 | 22,861 | 23,578 | 24,311 | 25,035 | 25,770 |
| Truck 2-axles | 1,005 | 1,061 | 1,099 | 1,280 | 1,339 | 1,398 | 1,457 | 1,516 | 1,575 | 1,634 | 1,694 | 1,756 | 1,821 | 1,887 | 1,956 | 2,028 |
| Truck 3-axles | 274 | 242 | 251 | 291 | 303 | 314 | 326 | 338 | 350 | 361 | 375 | 388 | 403 | 417 | 433 | 449 |
| Truck 4/5-axles | 2,144 | 1,904 | 1,979 | 2,291 | 2,383 | 2,476 | 2,568 | 2,660 | 2,753 | 2,845 | 2,949 | 3,057 | 3,169 | 3,285 | 3,406 | 3,530 |
| Truck 6+ axles | 4,568 | 4,056 | 4,215 | 4,880 | 5,077 | 5,273 | 5,470 | 5,667 | 5,864 | 6,060 | 6,283 | 6,513 | 6,751 | 6,998 | 7,255 | 7,521 |
| Motorcycle | 42 | 51 | 69 | 75 | 91 | 98 | 104 | 111 | 118 | 125 | 129 | 134 | 138 | 142 | 146 | 151 |
| **Total** | **13,797** | **15,217** | **18,859** | **21,211** | **24,239** | **25,882** | **27,524** | **29,167** | **30,809** | **32,451** | **33,565** | **34,709** | **35,859** | **37,041** | **38,230** | **39,448** |

The Project will improve long-distance traffic flows from Anatolia/Asia to Europe as well as localized traffic along the İstanbul- İzmir Industrial belt and tourist traffic. The Project also will reduce the traffic load in lower standard roads and improve the traffic safety in the AoI. Therefore, there will be no negative impact on AoI of the Project in terms of the change in traffic load. On the contrary, when the Project is operational, it is expected to have **positive impacts** on the traffic of the region.

#### 7.1.11.1.3 Decommissioning and Closure Phase

A new impact is not expected during the decommissioning and closure phase of the Project, other than those listed in the construction phase.

### *7.1.11.2 Mitigation Measures*

Within the scope of the Project, Traffic Management Plan will be prepared and implemented to maintain traffic safety on the roads to be used (on site and off site) and to prevent the risks which may outcome due to Project activities ensuring “safe site, safe vehicle and safe driver” at all the time.

Following points will be considered as a minimum during the construction phase of the Project regarding to traffic management:

- Traffic Management Plan will be developed and implemented for the Project.
- Continuous stakeholder engagement process and grievance mechanism will be in place according to SEP of the Project:
  - to exchange information on the Project with the local community and other stakeholders; and
  - to record and respond any complaints and concerns raised by the local community members and other stakeholders.
- Consideration will be given to traffic volumes at the rush hours of the day and delivery of equipment and materials will be utilised at quieter periods to avoid increased congestion on the roads used by the nearby communities.
- In case of any damage on the roads resulting from the Project activities, necessary maintenance works will be undertaken.
- Journey Management System will be implemented including a route survey to clarify the transportation route of the equipment/material prior to transportation.
- All vehicles will be subjected to periodic maintenance and inspections. Daily checks will be carried out before using the vehicle by the driver/operator or other authorized person e.g., mechanic or inspection team. The specimen “Daily Vehicle/Equipment Checklist” lists the daily check items which includes GIIP measures such as IVMS (In vehicle Monitoring System) and front view camera, ABS brakes (and Electronic Stability Program ESP, where possible)
- Project Area will be equipped with suitable and sufficient lighting to ensure sufficient visibility of operators.
- Necessary reversing procedures will be identified including installing reversing aids on vehicles, reversing sensors etc. Trained banksman will be used when reversing cannot be avoided.
- Parking areas will be designated with signs and reverse parking will be implemented for emergency situations.
- The routes to be used by pedestrians will be segregated from heavy vehicle routes.

- The speed limits will be implemented. Operators shall obey the speed limits within the camp sites and roads to be used within the Project area. A speed control mechanism will be implemented by e.g., using hand-held radar and random speed controls. The discipline procedure will be established and implemented for the operators who are breaching the speed limits.
- Seatbelts will be worn in vehicles and machinery when being operated.
- No vehicle/equipment/material will be allowed to enter work areas before obtaining approval from the security.
- Changes of the condition of the roads will be monitored regularly and necessary road correction remediation actions will be taken where necessary.
- In severe weather conditions, the HSE site supervisor will evaluate the safety of the roads while taking into account the safety of the operators and will decide whether it is safe for driving or not.
- Loading areas will be designed appropriately to prevent/minimize vehicle/pedestrian contact and property damages.
- All operators will be licensed/certified. Repair and maintenance of vehicles will be done by the authorized services.
- Fatigue and distraction procedures will be established considering the local legal requirements and the nature of the work.
- An external grievance mechanism will be established for the affected communities to express their concerns about the traffic management.
- Project disclosure activities will include informing communities about the Project traffic management controls and grievance mechanism. Collaboration with local communities and responsible authorities will be ensured to improve signage, visibility, road safety conditions especially near the roads and other locations where children may be present.
- Appropriate traffic signs, signals, lights, and markings will be placed at the required areas to prevent potential accidents/incidents. Barriers will be placed at the required areas to protect both human and assets.

General mitigation measures will be taken during the operation phase of the Project. Following points will be considered as a minimum during the operation phase of the Project:

- Horizontal (i.e., shoulder lines, traffic lines, parking lines, etc.) and vertical signing (i.e., traffic signs, plates, etc.) of the Motorway will be placed according to KGM’s technical specifications.
- Reflective signs and equipment should be kept clean for clear visibility. The warning signs will be monitored regularly to ensure that they are not removed, damaged, etc. and replaced as needed.
- The motorway pavement structure will be undergone routine maintenance to eliminate any damage to the road surface that may rick traffic safety. To keep the road functional, extensive repair and reconstruction work will also be carried out as needed.
- Within the scope of the Project, Intelligent Traffic System (ITS) will be built. Through the ITS, real-time signage warning systems will be used to warn drivers of traffic congestion, accidents, adverse weather conditions and other potential hazards.
- Measures will be taken to prevent parking vehicles at the entrance and exit roads of the service facilities.

### *7.1.11.3 Residual Impacts*

#### 7.1.11.3.1 Construction Phase

The residual impact on traffic component after the application of the abovementioned mitigation measures during construction phase is presented in the following table.

Considering the limited time needed for construction, and the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **negligible to low negative impact** is expected on the traffic component during the construction phase.

**Table 232: Traffic Impact Matrix for Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Increased Vehicular Traffic | Duration: | Medium | Medium-high | Short-mid-term | **Medium** | High | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Interruption of Roads and Limitation to Traffic | Duration: | Medium | Medium-high | Short-mid-term | **Medium** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

#### 7.1.11.3.2 Operation Phase

The residual impact on traffic component after the application of the abovementioned mitigation measures during the operation phase is presented in the following table.

**Table 233: Traffic Impact Matrix for Operation Phase (positive)**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Effectiveness of the Enhancement Measures | Residual impact value |
|---|---|---|---|---|---|---|---|
| Decreased Traffic Load in lower standard Road | Duration: | Very long | Medium | Long term | **High** | Medium-low | **High** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Medium | | | | | |

#### 7.1.11.3.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction phase for the decommissioning and closure phase of the Project.

### *7.1.11.4 Monitoring*

Monitoring activities are required to verify the effectiveness of the mitigation measures proposed. These monitoring activities are listed below:

- Investigation of the incidents and accidents and use of lesson's learned to improve traffic mitigations.
- Following of the licenses and medical surveillance of the operators to ensure that they are up to date.
- Monitoring condition of the roads to ensure safe driving.

- Controlling maintenance records of the vehicles to ensure regular maintenance activities take place.
- Weather forecast monitoring to ensure safety of the operators.
- Closely monitoring the compliance with speed limits to protect the health and safety of both public and employees.
- Following the comments and/or complaints received via grievance mechanism to improve traffic mitigations and to prevent air quality, noise and vibration impacts, if any.

Monitoring should in particular be designed to identify failure or ineffectiveness of mitigation measures in terms of road safety and nuisance prevention.

### 7.1.12 Visual

This chapter presents the findings of the assessment of potential effects of the Project with regard to visual aesthetics during both construction and operation phases.

The following legislation is considered to be relevant:

- Environment Law No. 2872 (1983), amended by Law No. 5491 (last amended in 2017)
- Law No. 2863 (1983) on the Preservation of the Cultural and Natural Assets
- Forest Law No. 6831 (1956)148 (last amended in 2004); and
- Law No. 4881 (2003) on the Approval of the European Landscape Convention.

Turkish legislation does not include specific requirements for landscape and visual assessment. IFC PSs are considered for the assessment of this component.

#### Methodology

- The first step of the visual impact assessment is to determine sensitive receptors and baseline conditions.
- The closest settlements to the Project components and some associated facilities were taken into account in identification of the sensitive receptors. During the field trip, sensitive receptors where access is not difficult and is possible were visited and baseline photos were taken. However, some parts of the motorway route and some associated facilities could not be accessed due to unsafe road conditions at the time of site visit.
- After the determination of the viewpoints (i.e., sensitive receptors), sensitivity levels of these receptors have been determined. Sensitivity levels of the viewpoints were defined considering (i) the area of the Project components that can be visible; (ii) the number of sensitive receptors (including settlements and people around the Project Area and common areas such as school, hospital, mosque etc.).
- Then, impact factors of the Project footprint have been determined for the construction and operation phases and impact matrix for each phase has been prepared.

#### *7.1.12.1 Impact Analysis*

During Project lifetime, visual impacts will be mainly associated with the following ***impact factors*** as stated previous chapters of this ESIA report:

- Emission of dust,
- Introduction of buildings/infrastructures,
- Vegetation clearing, and

- Emission of light.

In order to determine the visual impact caused by Project activities and components, 27 sensitive receptors close to the Project Area were selected.

## Sensitive Receptors

It should be noted that, the assessment of determining the sensitivity of the viewpoints is based on the professional judgement. The assessment has been conducted from aerial photos, field studies and publicly available data. The viewpoint locations were identified from publicly accessible locations only.

The details of the viewpoints are presented in table and figure below.

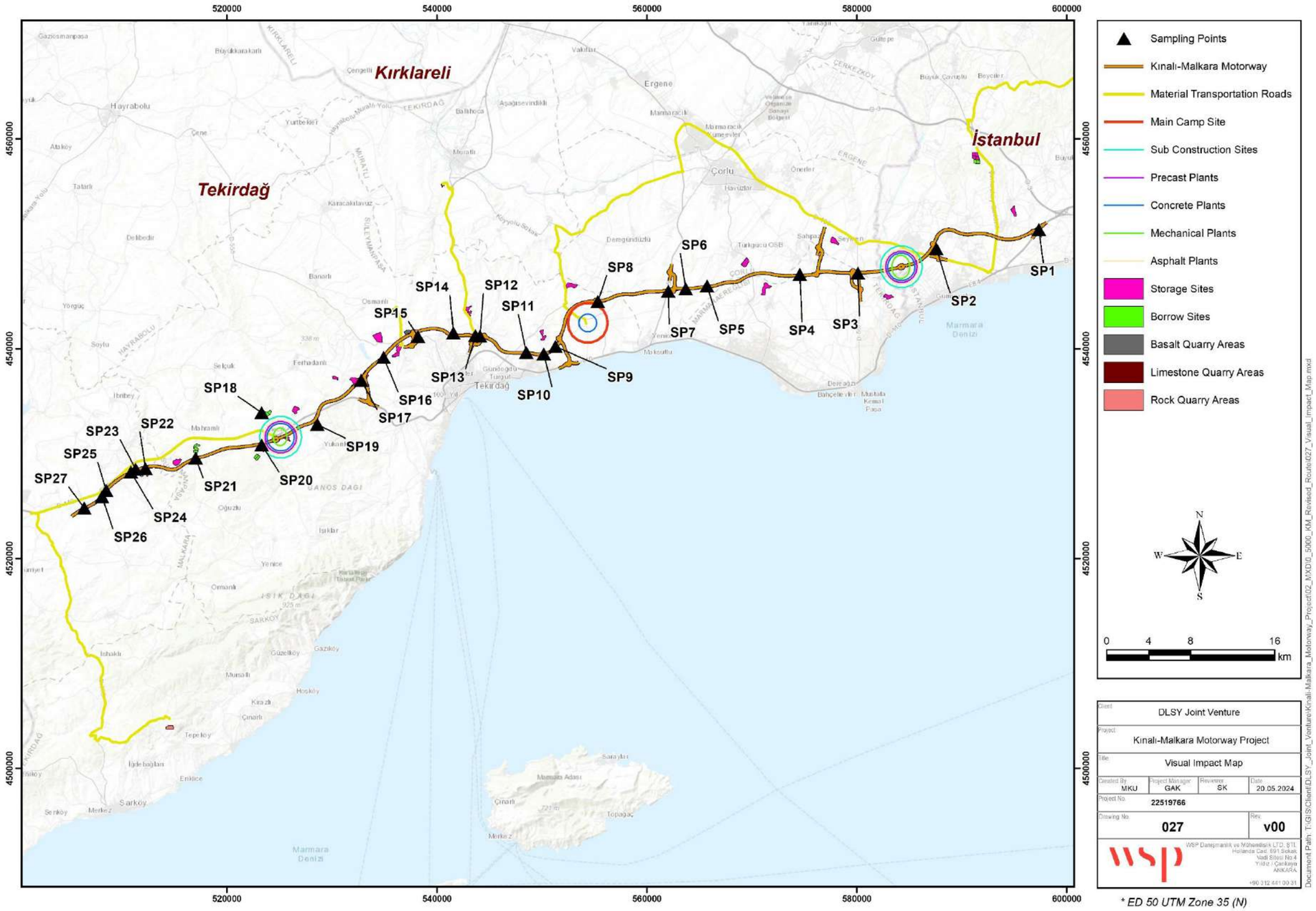
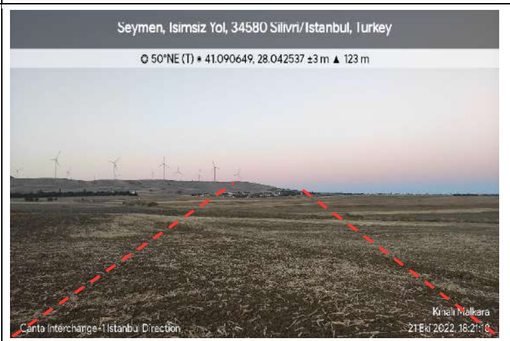
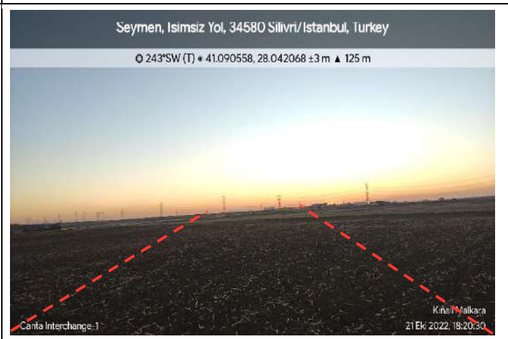
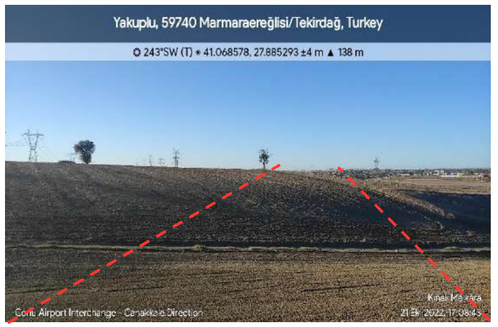
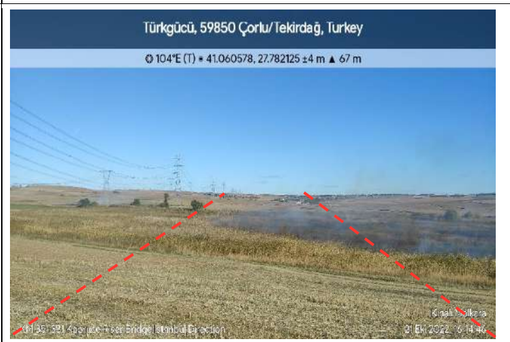
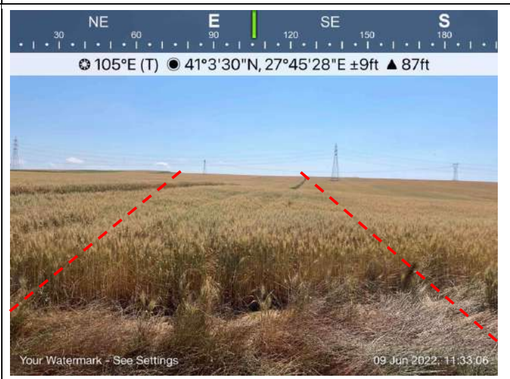
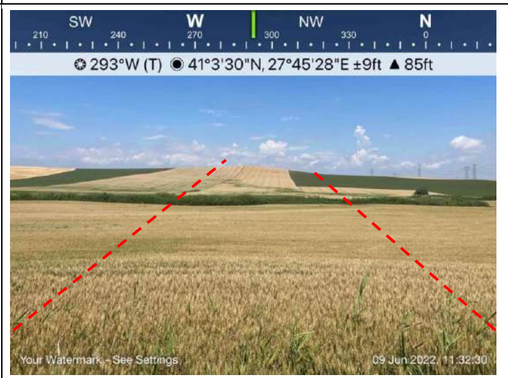
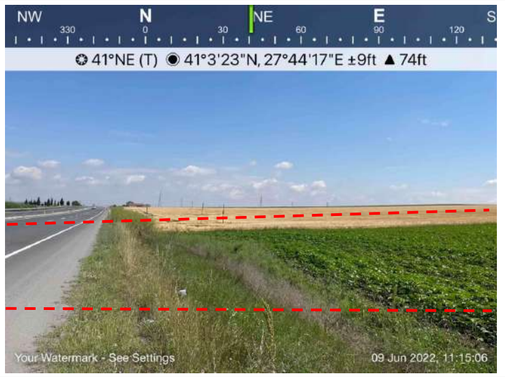
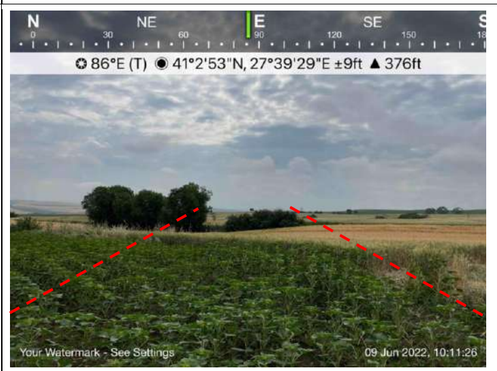
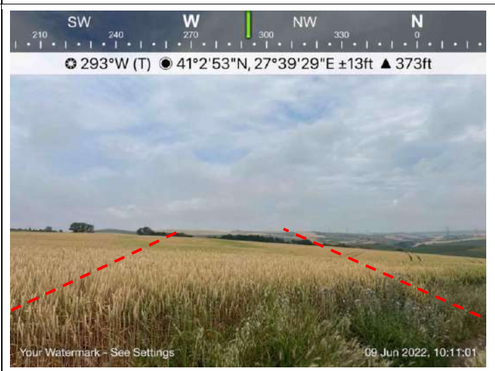


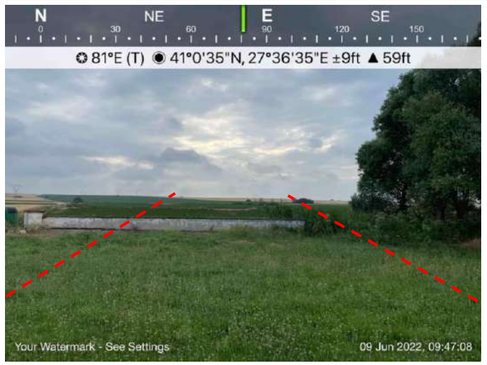
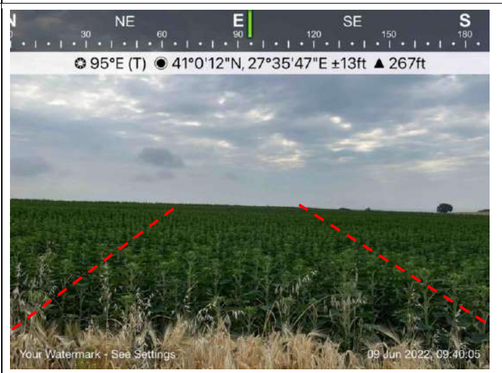
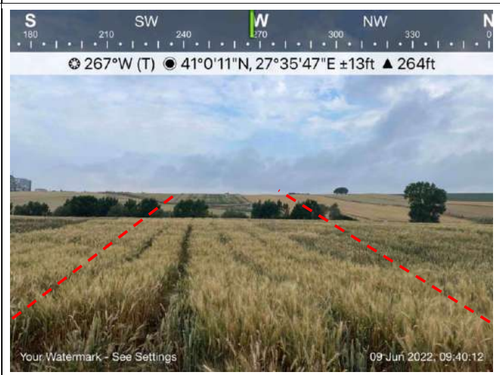

**Figure 247: Viewpoint Locations**

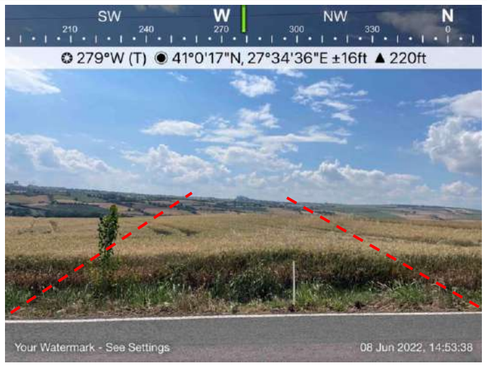
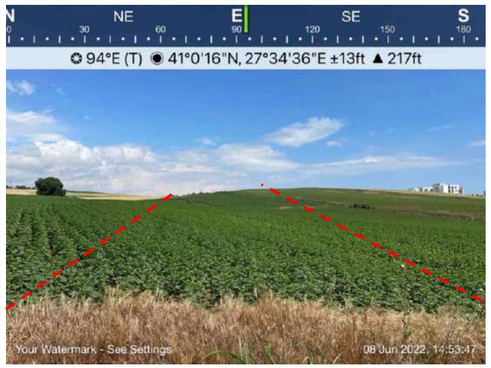
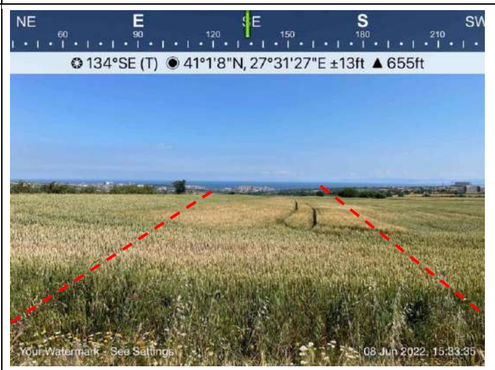
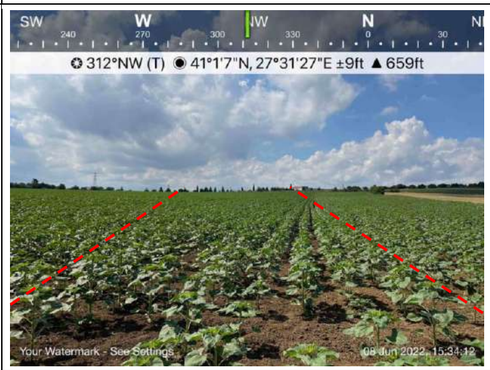
**Table 234: View from Sensitive Receptors**

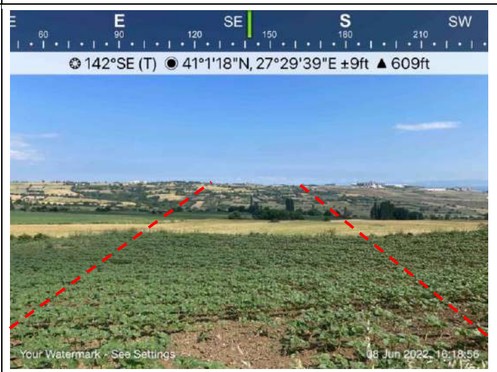
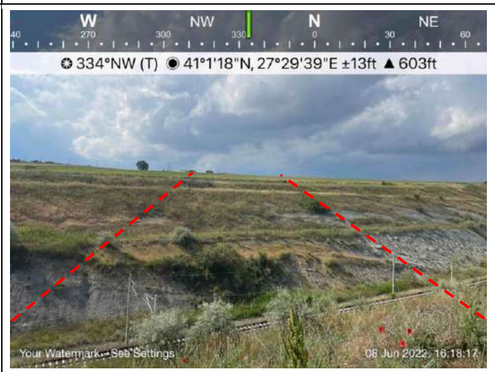
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 1 | 1+000 | 28°09’32” | 41°06’21” | NE, SW | Low |  |  |
| 2 | 13+000 | 28°02’33” | 41°05’26” | NE, WS | Medium |  |  |
| 3 | 21+500 | 27°57’11” | 41°04’13” | E, W | Low |  |  |

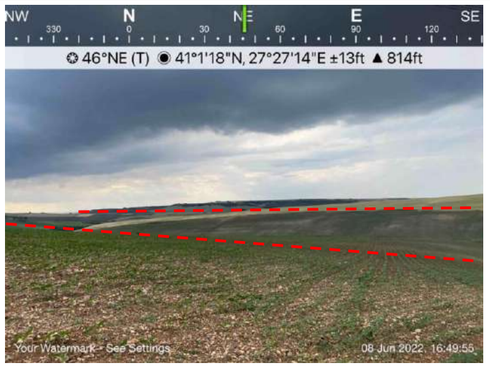
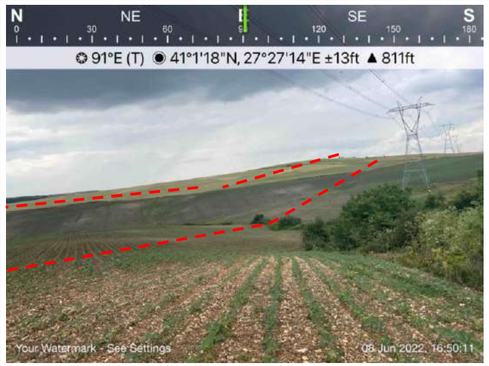
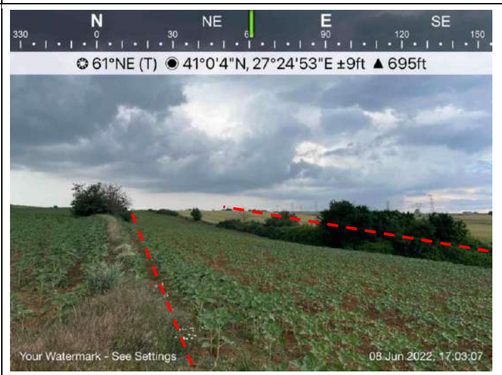
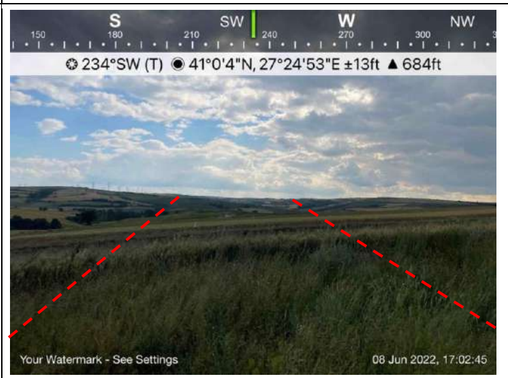
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 4 | 26+500 | 27°53’14” | 41°04’11” | E, W | Low |  |  |
| 5 | 35+380 | 27°46’55” | 41°03’38” | E, W | Low |  |  |
| 6 | 37+600 | 27°45’28” | 41°03’30” | E, W | Low |  |  |

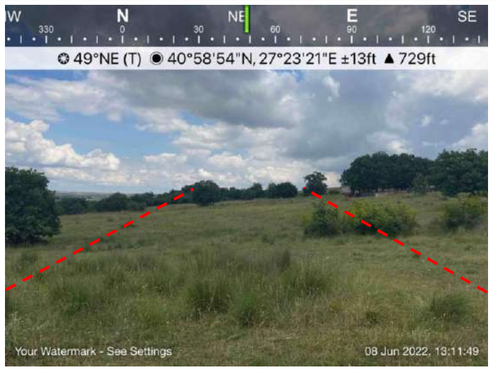
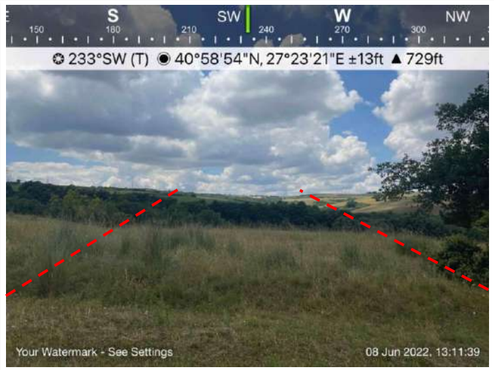
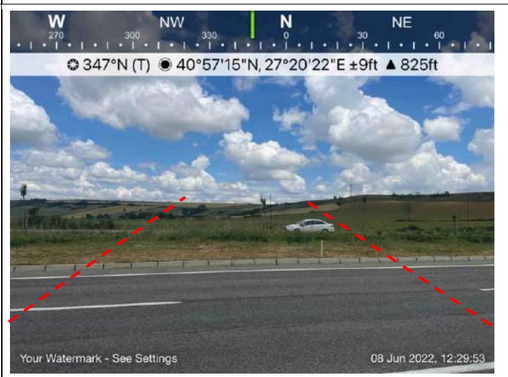
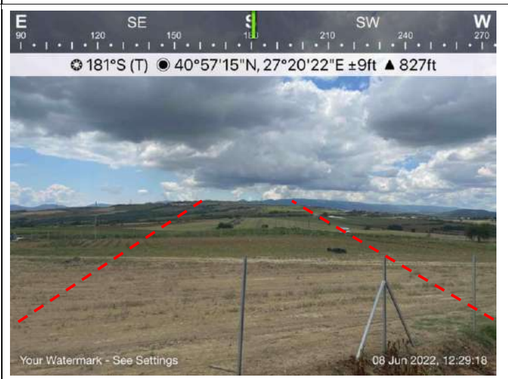
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 7 | 39+000 | 27°44’17” | 41°03’23” | E, W | Low |  |  |
| 8 | 46+200 | 27°39’29” | 41°02’53” | E, W | Low |  |  |

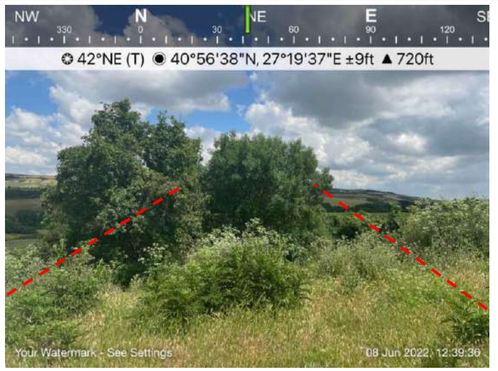
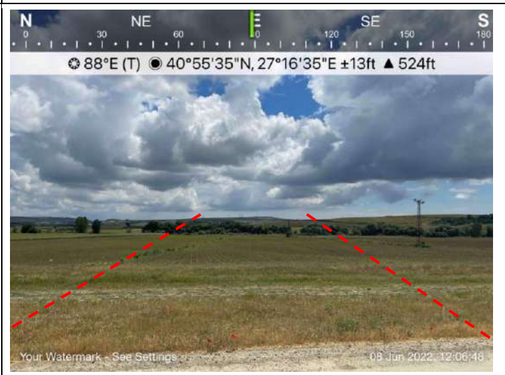
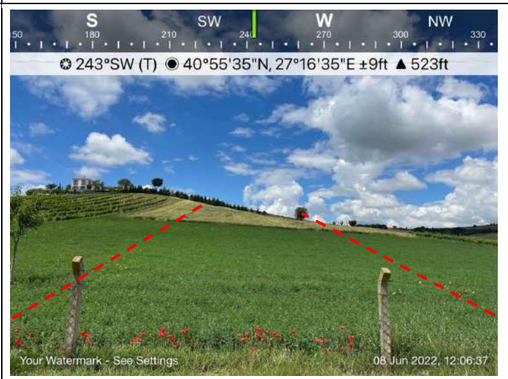
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 9 | 52+800 | 27°36’35” | 41°0’35” | E, W | Low |  |  |
| 10 | 54+200 | 27°35’47” | 41°0’12” | E, W | Medium |  |  |

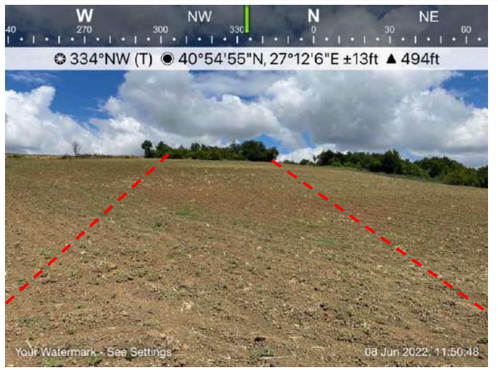
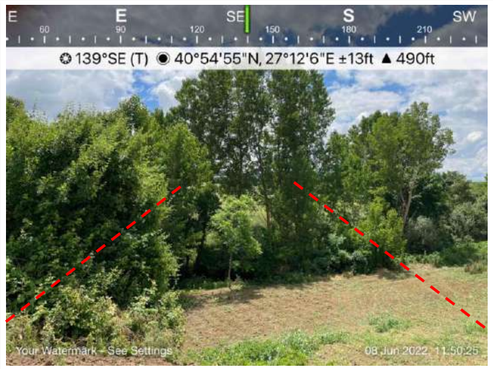
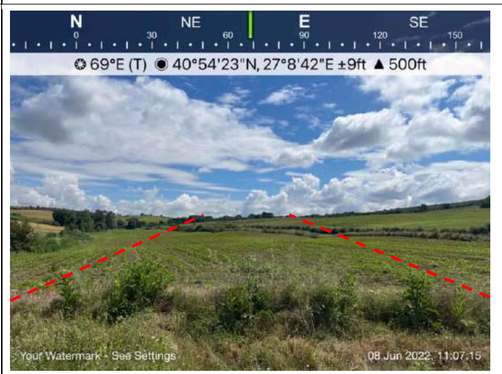
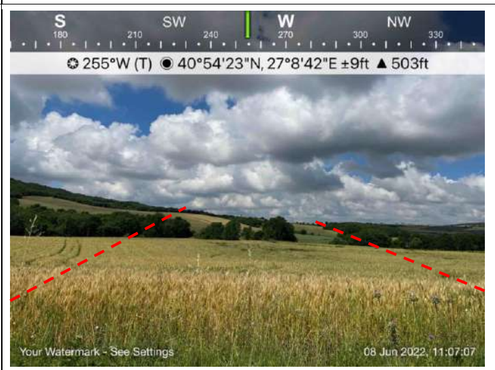
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 11 | 55+800 | 27°34’36” | 41°0’17” | E, W | High |  |  |
| 12 | 60+800 | 27°31’27” | 41°01’8” | SE, NW | High |  |  |

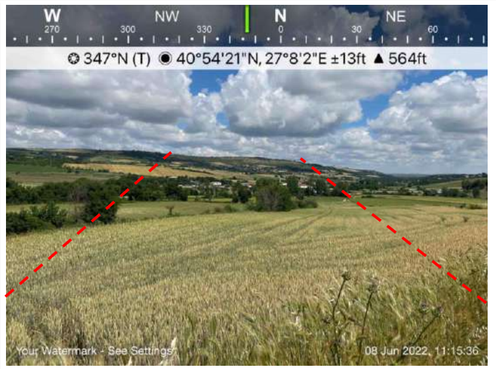
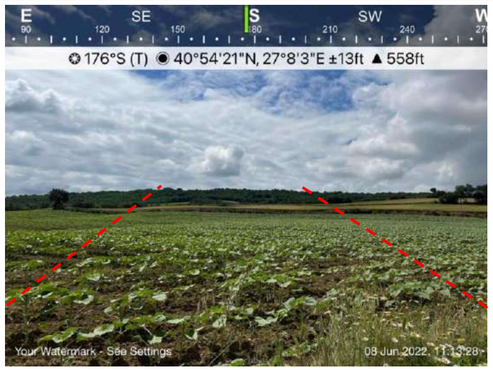
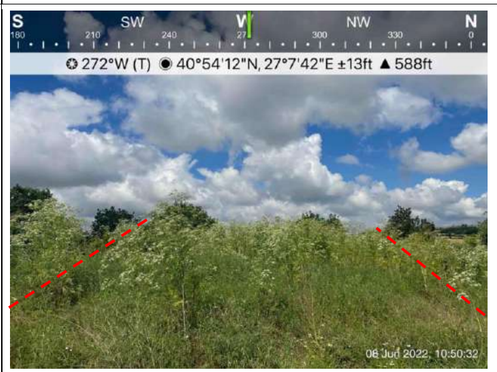
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 13 | 61+250 | 27°31’8” | 41°01’10” | W, E | High |  |  |
| 14 | 63+400 | 27°29’39” | 41°01’18” | SE, NW | Medium |  |  |

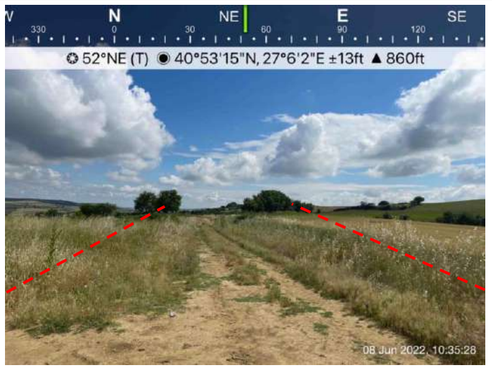
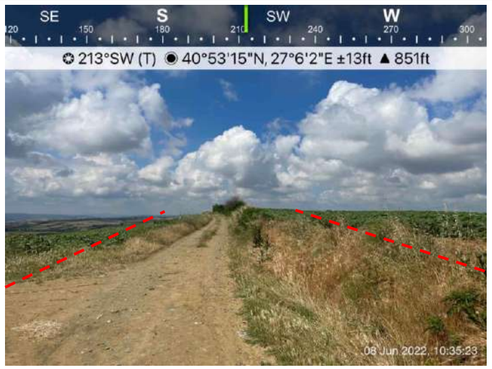
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 15 | 67+000 | 27°27’14” | 41°01’8” | SE, NW | Low |  |  |
| 16 | 71+000 | 27°24’53” | 41°0’4” | NE, SW | Low |  |  |

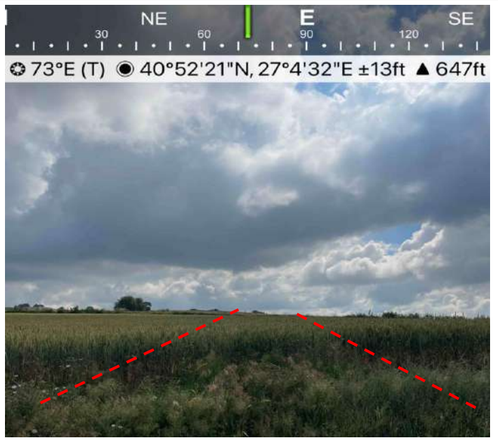
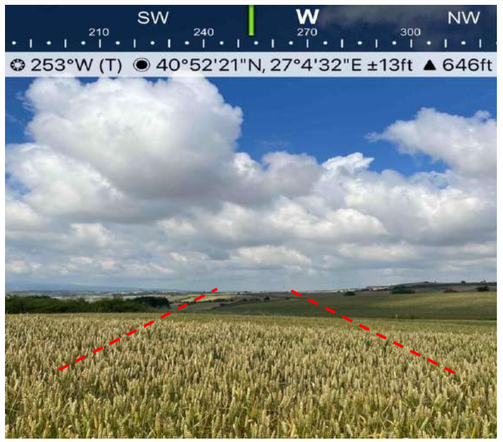
| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 17 | 74+000 | 27°23’21” | 40°58’54” | NE, SW | Medium |  |  |
| 18 | 79+500 | 27°16’35” | 40°57’15” | N, S | High |  |  |

| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 19 | 81+220 | 27°20’22” | 40°56’38” | NE, SW | High |  |  |
| 20 | 86+200 | 27°16’35” | 40°55’35” | E, SW | Low |  |  |

| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 21 | 92+500 | 27°12’6” | 40°54’55” | NW, SE | Low |  |  |
| 22 | 97+400 | 27°08’42’” | 40°54’23” | E, W | Medium |  |  |

| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 23 | 98+500 | 27°08’02” | 40°54’21” | N, S | High |  |  |
| 24 | 99+150 | 27°07’42” | 40°54’12” | E, W | Low |  |  |

| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 25 | 102+100 | 27°06’02” | 40°53’15” | NE, SW | Low |  |  |
| 26 | 102+700 | 27°05’44” | 40°52’56” | N, SW | Low |  |  |

| No. | KM | Coordinates | | Direction | Sensitivity | Photograph | |
|---|---|---|---|---|---|---|---|
| | | X | Y | | | KM (towards İstanbul) | KM (towards Malkara) |
| 27 | 104+800 | 27°04’32” | 40°52’21”N | E, W | Low |  |  |

**Impacts on landscape during the construction phase**

- Loss of existing vegetation
- Temporary change to the local topography due to the stockpiling
- Demolition of the properties along the route
- Temporary change to the land use

**Impacts on landscape during the operational phase**

- Permanent change to the nature within the scope of Project footprint
- Permanent modifications to existing landform
- Additional permanent structures

**Impacts on visual during the construction phase**

- Temporary stockpiling materials
- Temporary awareness of the construction activities

**Impacts on visual during operational phase**

- Permanent alteration to the nature of the viewing of prominent structures including overpasses and underpasses and the linear corridor of the motorway itself.
- Permanent visual awareness of above ground structures such as electrification and height of vertical structures.
- Increasing of visual awareness in the AoI where there is lighting in the motorway (especially for the intersections of the motorway and service facilities).

### *7.1.12.2 Mitigation Measures*

There are no industry standards or best practice guidance regarding with landscape mitigation and management within the scope of the local legislation. The proposed mitigation measures associated with the Project comprises of professional judgement.

- There should not be tall planting of trees within the 50 m motorway corridor for the Project due to avoid the disruption from potential vegetative contact with power supply and catenary posts.
- After the completion of construction, the areas used as construction area (mobilization areas etc.) will be returned to their original use.
- Where topsoil stripped, and stored on site for reuse, the stockpile mounds will be stored at a maximum height of 2 m in order to prevent the integrity of topsoil.
- During the construction phase, restricted hours of working will be proposed especially for built up areas. Using machinery during those hours should be avoided in residential properties. This approach should be detailed in Traffic Management Plan and Noise and Vibration Management Plan.
- Stockpiles to have maximum 5 m height to reduce the visual awareness within the views.
- The housekeeping of the entire Project Area will be given importance throughout the life of the Project.

- To minimize light spillage from the site, every effort should be made to minimize the number of lights consistent with health and safety standards. In a similar way, all lights should be shielded and as much as possible pointed to the ground to avoid direct light effects on sensitive receptors around the Project Area.
- Regular monitoring of the affected people's grievances with regard to visual impacts. For this, the external grievance mechanism should be implemented properly, and all stakeholders should have access to this mechanism.
- Implementation of dust suppression during construction.

#### *7.1.12.3 Residual Impacts*

The Project's visual component is impacted by four factors and these factors are evaluated considering duration, frequency, geographic extent, and intensity. Residual impact values for the impact factors are then calculated and classified.

Considering the limited time needed for construction, and the Project characteristics, and actions, as well as the proper implementation of the mitigation measures proposed above, **low to medium negative impact** is expected on the visual component during both construction and operation phases.

**Table 235: Visual Component Impact Matrix for Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Emission of Dust | Duration: | Medium | Medium | Mid term | **Medium** | Medium high | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction of buildings/ infrastructures | Duration: | Medium | Medium-low | Mid term | **Medium** | Medium-low | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Topsoil and lower soil removal (Vegetation clearing) | Duration: | Medium | Medium | Mid term | **Medium** | Medium-low | **Low** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Project Site | | | | | |
| | Intensity: | Low | | | | | |
| Emission of light | Duration: | Medium | Medium-low | Mid term | **Low** | Medium-low | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

**Table 236: Visual Component Impact Matrix for Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Introduction of buildings/ infrastructures | Duration: | Very long | Medium-low | Long term | **Medium** | Low | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of light | Duration: | Very long | Medium-low | Long term | **Medium** | Low | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

### *7.1.12.4 Monitoring*

Monitoring of visual impacts includes monitoring of community and stakeholders. Related grievances will be recorded and tracked via the Grievance Mechanism, within the Project's Stakeholder Engagement Plan, continuously in construction and operation phases.

Project Company will be responsible for periodically monitoring the visual and aesthetic condition of the Project facilities. Monitoring will generally be conducted during construction, routine operations and maintenance of the Project facilities. Qualified staff will visually assess the aesthetic condition of these facilities using accepted visual and aesthetic standards and take appropriate actions in consultation with the contractors or upper management if needed.

## 7.2 Biological Component

The LSA is situated in an area dominated by Modified Habitats (84%) mainly constitute of agricultural land. Within this highly modified landscape, patches of Natural Habitats are present (16%) and mainly characterized by deciduous woodlands and pastures.

Critical Habitats (CHs) identified within the LSA are triggered by flora and fauna species listed in Table 237 below.

In the last column of the table below, for each species triggering CH the EUNIS codes of the most suitable habitats possibly hosting the species' presence are specified.

**Table 237: Results of Critical Habitat assessment (IFC PS6, 2019)**

| Taxon | Species | Common name | IUCN Red List | National IUCN status | Endemic/RR | Lit./ Obs. | IFC criteria | Habitat suitability |
|---|---|---|---|---|---|---|---|---|
| Flora | *Cirsium baytopae* | - | - | EN | Endemic/RR | O | Criterion 1a & 2a | G1.7, G5.2, G5.7 |
| Birds | *Aythya ferina* | Common Pochard | VU | - | - | L | Criterion 3a | C2.3 |
| | *Branta ruficollis* | Red-breasted Goose | VU | - | - | L | Criterion 3a | C2.3 |
| Mammals | *Spermophilus citellus* | European Souslik | EN | - | - | L | Criterion 1a | E2.1, E3.2 |

The sensitivity of the various biodiversity components is defined as follows:

- the component, including Natural habitats, is considered having a **Medium** sensitivity;
- Critical Habitats (CHs) are considered having a **High** sensitivity.

The potential direct and indirect impacts are considered for Modified Habitats, Natural Habitats (NHs) and Critical Habitats (CHs), and the resulting residual impacts vary according to their characteristics.

The impact assessment for biodiversity follows the semi-quantitative method described in the Impact Assessment Methodology Chapter 5.0, which is very briefly summarized again here. An impact value for an impact factor affecting a biodiversity feature is calculated by summing scores for impact criteria, such as duration and intensity, and multiplying by the sensitivity of the biodiversity feature. The sensitivity scale is given in the IA Methodology Chapter and Sensitivity rankings have been provided above. Critical Habitats (CHs) identified within the LSA are triggered by different flora and fauna species.

Project actions, leading to direct and indirect impact as well as the potentially affected biodiversity components potentially have been outlined in previous chapters and are further explored below. Impacts on biodiversity, including flora fauna and habitats, are assessed in section 7.2.1 for the construction phase, in section 7.2.2 for the operation phase, and in section 7.2.3 for the decommissioning and closure phase.

Specific impacts on Critical Habitats, are discussed in depth in sections 7.2.1.4 and 7.2.2.4 for the construction and operation phases, respectively.

Avoidance, mitigation and rehabilitation are proposed in this section according to the mitigation hierarchy principle. Monitoring measures are also proposed.

### 7.2.1 Construction Phase

The potential impacts on biodiversity are mainly associated to the following impact factors:

1) vegetation and topsoil removal;
2) changes in local hydrology and water quality;
3) increase in vehicular traffic;
4) emission of pollutants, dust and particulate matter
5) emission of noise and vibrations;
6) introduction and spreading of alien species.

All the impact factors identified above are described and discussed in the following assessment.

1) Vegetation and topsoil removal

The areas affected by this impact factor will be limited to the Project footprints, including associated and temporary facilities present during the construction phase. A 50 m wide corridor is considered for the Project Route, which includes the expropriation areas. The Project route and the expropriation areas are referred to in the document as “expropriation corridor”. Associated facilities include permanent facilities such as switchyard and stations and temporary facilities such as camp sites, storage areas, borrow pits, limestone quarries, concrete plants, sub-construction sites, and access roads.

Construction works will cause direct habitat loss and habitat fragmentation. The vegetation present within the construction site footprint will be cleared and the topsoil will be removed. The soil will be excavated, and excavated materials will be moved to storage areas, moreover the yard surface will be levelled and compacted to create a suitable ground for construction.

Flora species in the construction site will be directly impacted by vegetation clearing at the beginning of construction yard setting and activities.

Vegetation removal may cause the destruction of suitable habitats for fauna species that use the impacted vegetation as food, shelter or nesting site. Local fauna could be directly impacted by the vegetation clearing and soil disturbance activities performed during site preparation. Species characterized by low mobility (such as reptiles and amphibians) may not be able to move ahead of construction. Species with a hiding strategy to escape predators might also be accidentally killed during the construction operations. Nesting sites could be destroyed by vegetation clearing with different effects depending on timing and the species reproduction strategy.

Vegetation and topsoil removal could also decrease the water retention capacity of the soils in the area, particularly in the case of steep slopes or sensitive areas, increasing localized erosion phenomena. If not correctly mitigated and monitored, the erosion phenomena may impact terrestrial flora and habitats also outside the Project footprint. Moreover, the presence of steep slopes could act as a barrier for some species characterized by low mobility (e.g., Common tortoise).

2) Changes in local hydrology and water quality

Construction activities, such as surface levelling and grading, will cause changes in local morphology and hydrology. The crossing points between the motorway and the permanent and temporary streams are particularly sensitive to this impact factor.

Changes of local hydrology could generate habitat modifications for fish species as the river features (e.g. water velocity and river-bed characteristics) will be modified in the proximity of the river crossings. Without proper mitigation and monitoring measures the diversion could also cause temporary habitat fragmentation due to temporary dry out of the diversion channel or physical structure that could limit fish mobility upstream.

In addition, during the construction phase any uncontrolled release of sediment or other potential pollutants may cause a change in water quality (e.g. dissolved oxygen) and a loss in nursery habitat caused by silt deposition and accumulation. Particulate run-off and sediment release caused by construction preparation activities and by the diversion of the rivers would likely have a localised impact with sediments and pollutants moving downstream. Freshwater fauna species, especially invertebrate fauna, could also be impacted by pollution.

Using a precatory approach, a 100 m buffer is considered around project facilities in correspondence of aquatic habitats.

3) Increase in vehicular traffic

During construction, an increase in vehicular traffic is expected within the construction site and the different project facilities. Therefore, accidental collisions with wildlife might occur (direct impact). The Project will use existing roads. However increased vehicular traffic could lead to increase road kills and have a significant impact on some wildlife populations.

Increased vehicular traffic may also determine indirect negative impacts, such as habitat degradation, and therefore may affect animal population linked to specific habitats.

In general, traffic can have an important influence on wildlife behaviour and distribution (Forrest and Sr. Clair, 2009[205]). Amphibians might be attracted by stagnant water that forms at roadside or within the construction area. Reptiles and other ectotherms go there to bask in the sun, some birds use roadside gravel to aid their digestion of seeds. Songbirds come to dust bathe on dirt roads, where they are vulnerable to vehicles as well as predators. Vultures, crows, foxes and other scavengers seek out roadkill and often become roadkill themselves. Mammals might be attracted by organic waste or to de-icing salts, browsing herbivores are attracted to the vegetation of roadside edge, rodents proliferate in the artificial grasslands of road verges, and many large mammals find roads to be efficient travel ways.

Using a precautionary approach, a 300 m buffer is considered around project facilities.

4) Emission of pollutants, dust and particulate matter

Construction activities (e.g. vegetation clearance, surface levelling, temporary stockpiling of excavated material, transportation of soil and construction materials, construction of the facilities, realization of the pavement, mobilization of heavy trucks, etc.) are expected to generate pollutants, dust, and particular matter emissions.

[205] Forrest, A., & St. Clair, C., 2009. Impacts of vehicle traffic on the distribution and behaviour of rutting elk, Cervus elaphus. Behaviour, 146(3), 393-413.

Dust from construction activity could affect the surrounding vegetation and habitats due to the continuous and significant dust deposition. Specifically, dust emissions could impact vegetation by covering leaf surface and through impacts on soil composition and structure (Farmer A.M., 1993[206]). Dust can block stomata on the leaf surface, affect photosynthesis, respiration, transpiration, and may cause leaf injury symptoms. As a result, the productivity of plants can decline. With the consequent reduction in vegetation growth, abundance and species loss.

A clear guideline value to protect vegetation from dust is not available. Airborne soil dust is typically coarse and therefore remains airborne only for short periods. United States Environmental Protection Agency (US EPA) research shows that 90% of total airborne dust returns to the earth's surface within 100 m of the emission source and over 98% within 250 m. However, under strong wind conditions, these effects could extend further.

Fauna species could be directly affected through inhalation or ingestion of vegetation affected by dust deposition. Indirect effects on fauna species could be determined by species habitat degradation due to dust emissions, resulting in the reduction of habitat suitability for wildlife.

Due to the dispersion of dust and particulate matter, which is considered highly frequent and of low intensity, the impacts are focused on and around the Project footprint. Therefore, using a precautionary approach, a 100 m buffer is considered around Project components, associated facilities and temporary facilities, present during construction.

5) Emission of noise and vibration

The emission of noise and vibration is expected to be of high intensity for the construction phase. Construction activities such as vegetation clearance, surface levelling and grading, excavation of construction material, transport and temporary stockpiling of material, construction of the facilities are expected to generate noise and vibration.

The emission of noise and vibrations could impact sensitive fauna species leading to their temporary avoidance of surrounding areas. Noise has the greatest effect on wildlife that relies heavily on auditory signals for survival and especially on birds and mammals. Disturbance from anthropogenic noise, for example, is known to be correlated with reduced densities of breeding birds (Reijnen *et al*., 1995[207]; Canaday and Rivadeneyra, 2001[208]). The effects of noise disturbance from human activity on wildlife are mostly perceived over short distances in a species- specific way (up to ~ 300 m, Reijnen *et al*., 1995[207]; Canaday and Rivadeneyra, 2001[208]).

Therefore, using a precautionary approach, a 300 m buffer is considered around Project components, associated facilities and temporary facilities present during construction.

The effects of vibration on wildlife are poorly studied, however avoidance behaviour around the source of vibration is likely to exist for birds, reptiles and amphibians. Birds and reptiles are highly sensitive to vibration (Hetherington *et al.*, 2008[209]), for which low-frequency noise can be a source of information about approaching predators and prey. Also, amphibians have a high sensitivity to vibration (Lewis

[206] Farmer, A. M. (1993). The effects of dust on vegetation—a review. Environmental pollution, 79(1), 63-75.

[207] Reijnen, R., Foppen, R., Braak, C. T., & Thissen, J., 1995. The Effects of Car Traffic on Breeding Bird Populations in Woodland. III. Reduction of Density in Relation to the Proximity of Main Roads. Journal of Applied Ecology, 32(1), 187–202.

[208] Canaday, C., Rivadeneyra, J., 2001. Initial effects of a petroleum operation on Amazonian birds: terrestrial insectivores retreat. Biodiversity and Conservation 10, 567–595.

[209] Hetherington, T., Thewissen, J. G. M., & Nummela, S., 2008. Comparative anatomy and function of hearing in aquatic amphibians, reptiles, and birds. Sensory evolution on the threshold: adaptations in secondarily aquatic vertebrates, 183-209

and Narins, 1985[210]): there are species that use low-frequency acoustic cues detected via ground vibrations to communicate, to time their emergence from burrows (Dimmittand and Ruibal, 1980[211]).

During the construction phase, most fauna species may temporarily avoid construction areas and their immediate vicinities and, according to Helldin *et al.* (2012)[212], this behaviour is mainly due to the increase in human activity. An impact could be expected especially during the breeding period on birds and mammals, which may be frightened by noise and might abandon their nest/mating ground. In particular, the breeding period for bird species in the area ranges from April to July, with a peak period from May to June.

6) Introduction and spreading of alien species

Removal of natural vegetation cover and soil disturbance could facilitate the spreading of invasive alien (non-native) species (IAS) accidentally introduced by cars, trucks and other heavy machinery used during construction. Invasive alien species tend to have an advantage in disturbed ecosystems, and if they penetrate into a habitat, they can potentially change its functionality and species composition, including priority biodiversity species.

Using a precautionary approach, a 300 m buffer around the Project facilities is considered for this impact factor.

Local fauna that depends on those ecosystems could also be indirectly affected. The habitats around the construction sites could experience a decrease in biodiversity in the immediate vicinity of the roads, with a consequent trivialization (potential appearance of more dominant species) of the ecosystem in a small buffer area close to the roads with a higher traffic.

The effects of these potential impacts on biodiversity, especially on natural habitats, are estimated and discussed below. The areas potentially impacted are represented from Figure 248 to Figure 253 and their numerical estimation is presented in the Table 238 below.

Additional verification surveys will be carried out in order to provide ground-truthing of all the areas identified as natural habitats. These surveys will be performed as soon as possible. However, the time planning for these surveys should also take into consideration the seasonality for the collection of detailed information on biodiversity. Nevertheless, the planning for these surveys shall also consider the species phenology and the seasonality for the collection of detailed information on biodiversity. For this reason, we suggest considering also April-June as the best period for collecting reliable and complete data on the majority of species. Data collected through these additional verification surveys will be essential to inform a more detailed and precise quantification of natural and modified habitats.

According to the available primary and secondary data, direct impacts will impact 5% of the total LSA. The direct impacts will be mainly concentrated on modified habitats (950.51 ha). Direct impacts could affect 13% of the total natural habitats, especially permanent mesotrophic pastures and aftermath-grazed meadows (E2.1, 412.65 ha EUNIS habitat type) and on deciduous woodlands (respectively G1.7, 272.83 ha and G5.2, 66.25 ha EUNIS habitat type). The project will largely make use of existing access roads as such will minimize further habitat destruction/degradation.

[210] Lewis, E. R., Narins, P. M., 1985. Do frogs communicate with seismic signals? Science 227(4683):187-9.

[211] Dimmitt, M. A., & Ruibal, R., 1980. Environmental Correlates of Emergence in Spadefoot Toads (Scaphiopus). Journal of Herpetology, 14(1), 21–29.

[212] Helldin, J. O., Jung, J., Neumann, W., Olsson, M., Skarin, A., & Widemo, F., 2012. The impacts of wind power on terrestrial mammals: A synthesis. Naturvårdsverket, p. 51.

Indirect impacts in the 100 m buffer deriving from construction impact a total of 22% of the LSA. Indirect impacts from construction in the 100 m buffer will be greater on modified than natural habitats (6,747.78 ha and 1,225.16 ha respectively).

Indirect impacts within the 100 m buffer could potentially affect 21% of the total natural habitats. The impact will be mostly on deciduous woodlands (respectively G1.7, 641.33 ha and G5.2, 118.29 ha EUNIS habitat type), on meadows and grasslands (E2.1, 362.21 ha and E3.2,11.49 ha EUNIS habitat type) on coppice plantations (G5.7, 53.13 ha EUNIS habitat type), followed by a lighter impact on permanent and temporary watercourses (respectively C2.3, 13.42 ha and C2.5, 15.35 ha EUNIS habitat type).

Indirect impacts in the 300 m buffer deriving from construction could impact a total of 30% of the LSA. Indirect impacts within the 300 m buffer will be mostly on agricultural fields (I1.1, 8,659.24 ha and I1.3, ha 167.84 EUNIS habitat type).

Indirect impacts within the 300 m buffer could potentially affect 25% (1,431.90 ha) of the total natural habitats. They will be mostly on deciduous woodlands (G1.7, 655.09 ha and G5.2, 184.65 ha EUNIS habitat type), followed by meadows (E2.1, 437.14 ha EUNIS habitat type) and freshwater courses (C2.5, 51.58 ha and C2.3, 23.93 ha EUNIS habitat type).

**Table 238: Direct and indirect impacts on EUNIS habitats calculated within the LSA for the construction phase**

| EUNIS Habitat Types | Total LSA | Direct Impacts within the Project Construction Footprint | | Indirect Impacts within 100 m from the Project Construction Footprint | | Indirect Impacts within 300 m from the Project Construction Footprint | |
|---|---|---|---|---|---|---|---|
| | ha | ha | % | ha | % | ha | % |
| **Natural Habitats** | | | | | | | |
| C2.3 - Permanent non-tidal, smooth-flowing watercourses | 68.07 | 0.70 | 1 | 13.42 | 20 | 23.93 | 35 |
| C2.5 - Temporary running waters | 111.49 | 2.56 | 2 | 15.35 | 14 | 51.58 | 46 |
| E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows | 1,251.79 | 412.65 | 33 | 362.21 | 29 | 437.14 | 35 |
| E3.2 - Mediterranean short humid grassland | 85.25 | 6.02 | 7 | 11.49 | 13 | 25.95 | 30 |
| G1.7 - Thermophilous deciduous woodland | 3,007.42 | 272.83 | 9 | 641.33 | 21 | 655.09 | 22 |
| G4 - Mixed deciduous and coniferous woodland | 295.11 | 0.00 | - | 9.94 | 3 | 2.94 | <1 |
| G5.2 - Small broadleaved deciduous anthropogenic woodlands | 589.70 | 66.25 | 11 | 118.29 | 20 | 184.65 | 31 |
| G5.7 - Coppice and early-stage plantations | 290.33 | 4.98 | 2 | 53.13 | 18 | 50.62 | 17 |
| *Subtotal* | *5,699.16* | *765.99* | *13* | *1,225.16* | *21* | *1,431.90* | *25* |
| **Modified Habitats** | | | | | | | |
| I1.1 - Intensive unmixed crops | 25,969.24 | 913.36 | 4 | 5,748.13 | 22 | 8,659.24 | 33 |
| I1.3 - Arable land with unmixed crops grown by low-intensity agricultural methods | 672.70 | 11.51 | 2 | 141.70 | 21 | 167.84 | 25 |

| EUNIS Habitat Types | Total LSA | Direct Impacts within the Project Construction Footprint | | Indirect Impacts within 100 m from the Project Construction Footprint | | Indirect Impacts within 300 m from the Project Construction Footprint | |
|---|---|---|---|---|---|---|---|
| | ha | ha | % | ha | % | ha | % |
| J1.7 - High density temporary residential units | 34.20 | 0.00 | - | 11.10 | 32 | 0.00 | - |
| J2.1 - Scattered residential buildings | 994.40 | 2.72 | <1 | 212.94 | 21 | 98.73 | 10 |
| J2.3 - Rural industrial and commercial sites still in active use | 471.72 | 0.00 | - | 105.09 | 22 | 3.07 | <1 |
| J3 - Extractive industrial sites | 176.72 | 0.70 | <1 | 32.33 | 18 | 23.20 | 13 |
| J4.2 - Road networks | 112.28 | 0.90 | <1 | 46.66 | 42 | 9.82 | 9 |
| X10 - Mosaic landscapes with a woodland element (bocages) | 2,393.13 | 21.32 | <1 | 449.83 | 19 | 484.03 | 20 |
| *Subtotal* | *30,824.39* | *950.51* | *3* | *6,747.78* | *22* | *9,445.93* | *31* |
| ***Total*** | ***36,523.55*** | ***1,716.50*** | ***5*** | ***7,972.94*** | ***22*** | ***10,877.83*** | ***30*** |

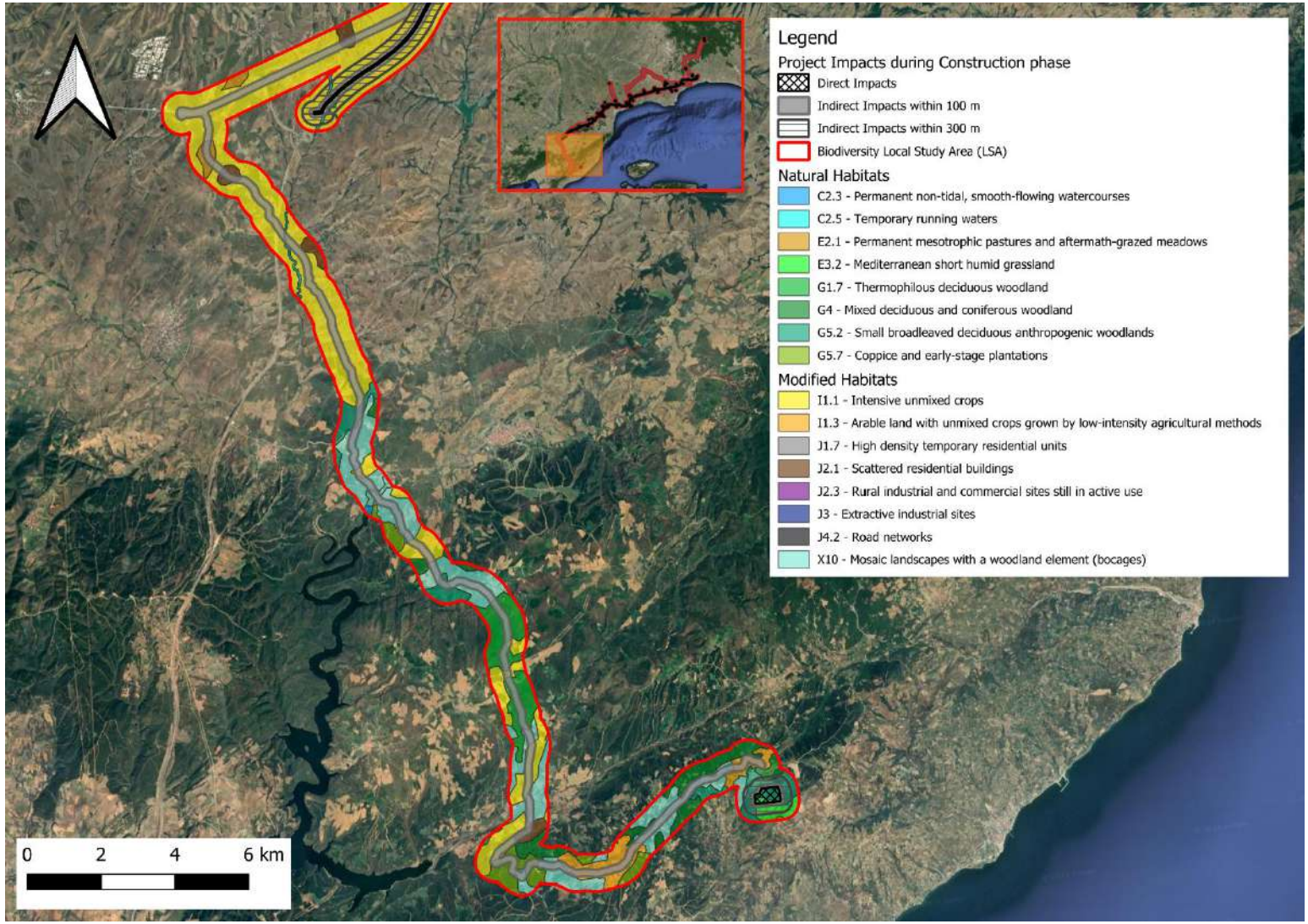



**Figure 248: Map of the potential direct and indirect construction impacts on EUNIS habitats (Map 1 out of 6)**

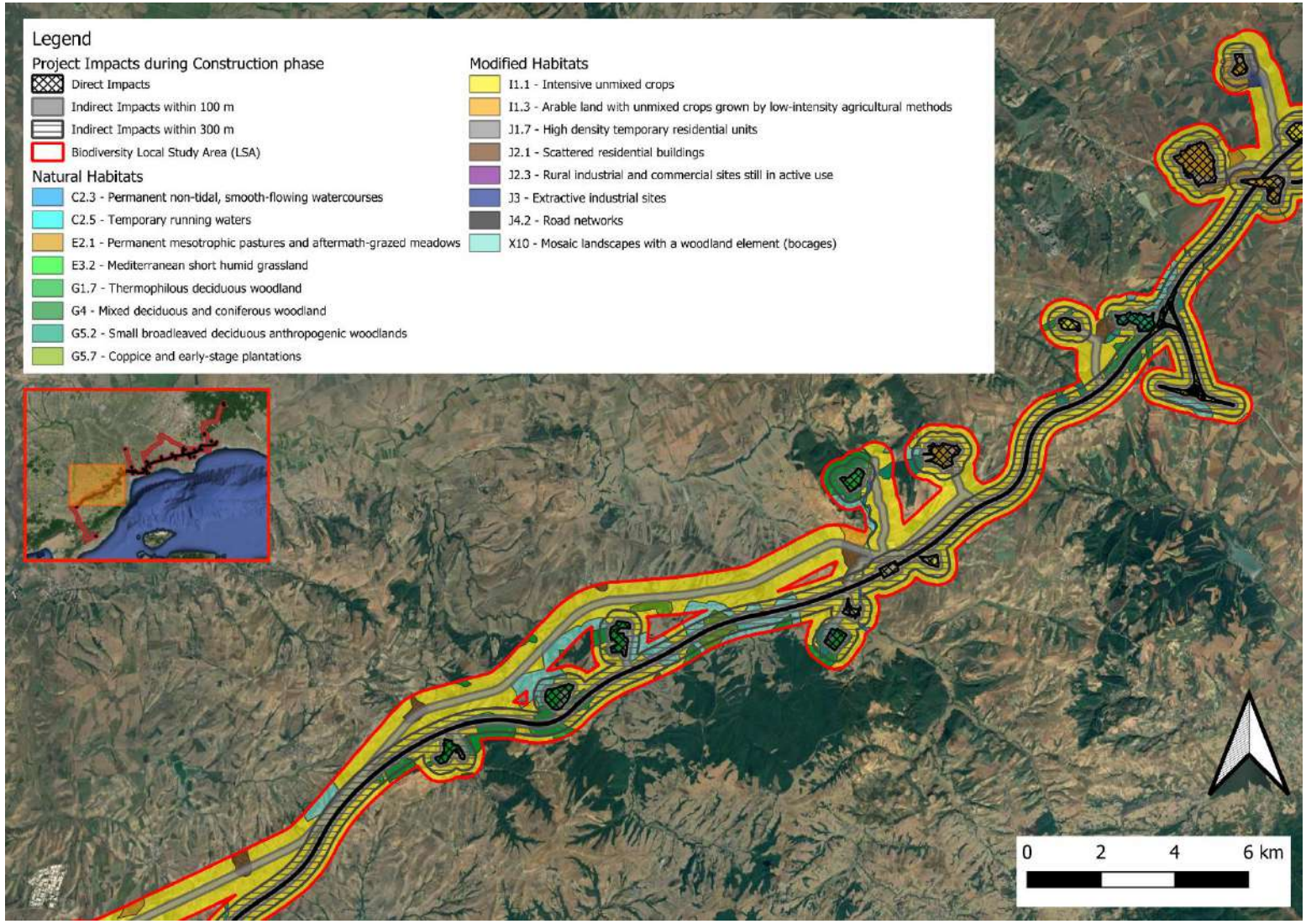



**Figure 249: Map of the potential direct and indirect construction impacts on EUNIS habitats (Map 2 out of 6)**

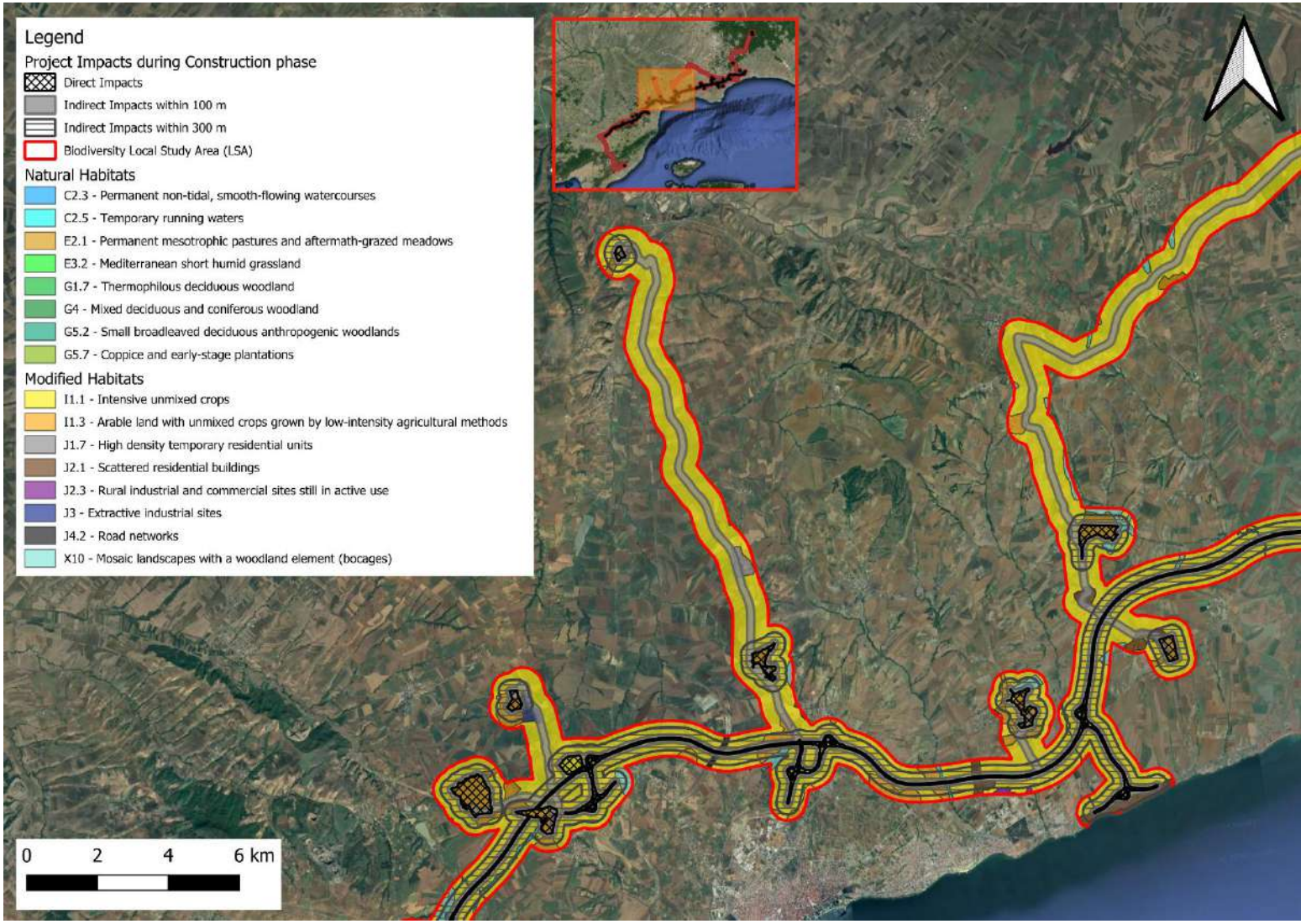



**Figure 250: Map of the potential direct and indirect construction impacts on EUNIS habitats (Map 3 out of 6)**

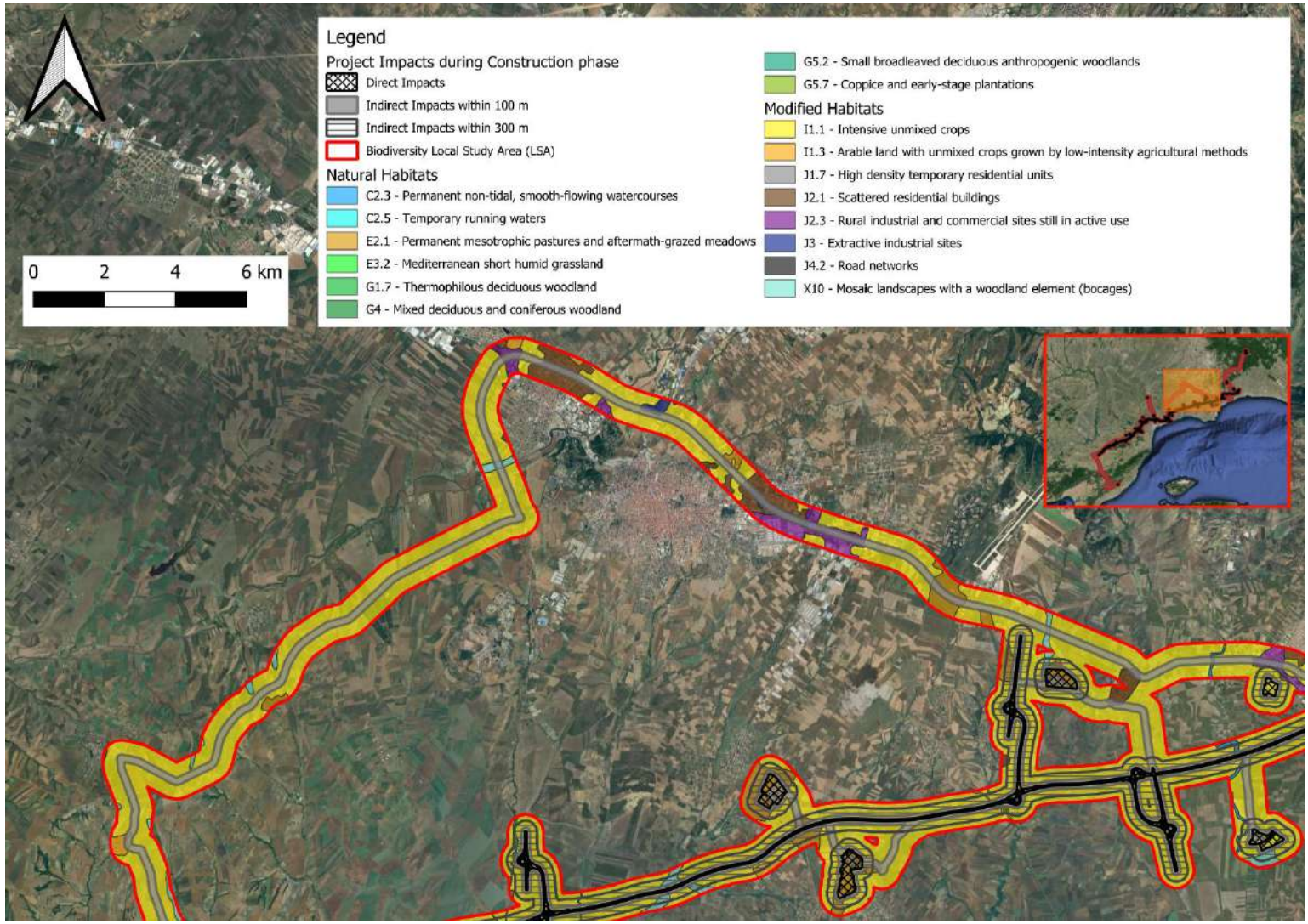



**Figure 251: Map of the potential direct and indirect construction impacts on EUNIS habitats (Map 4 out of 6)**

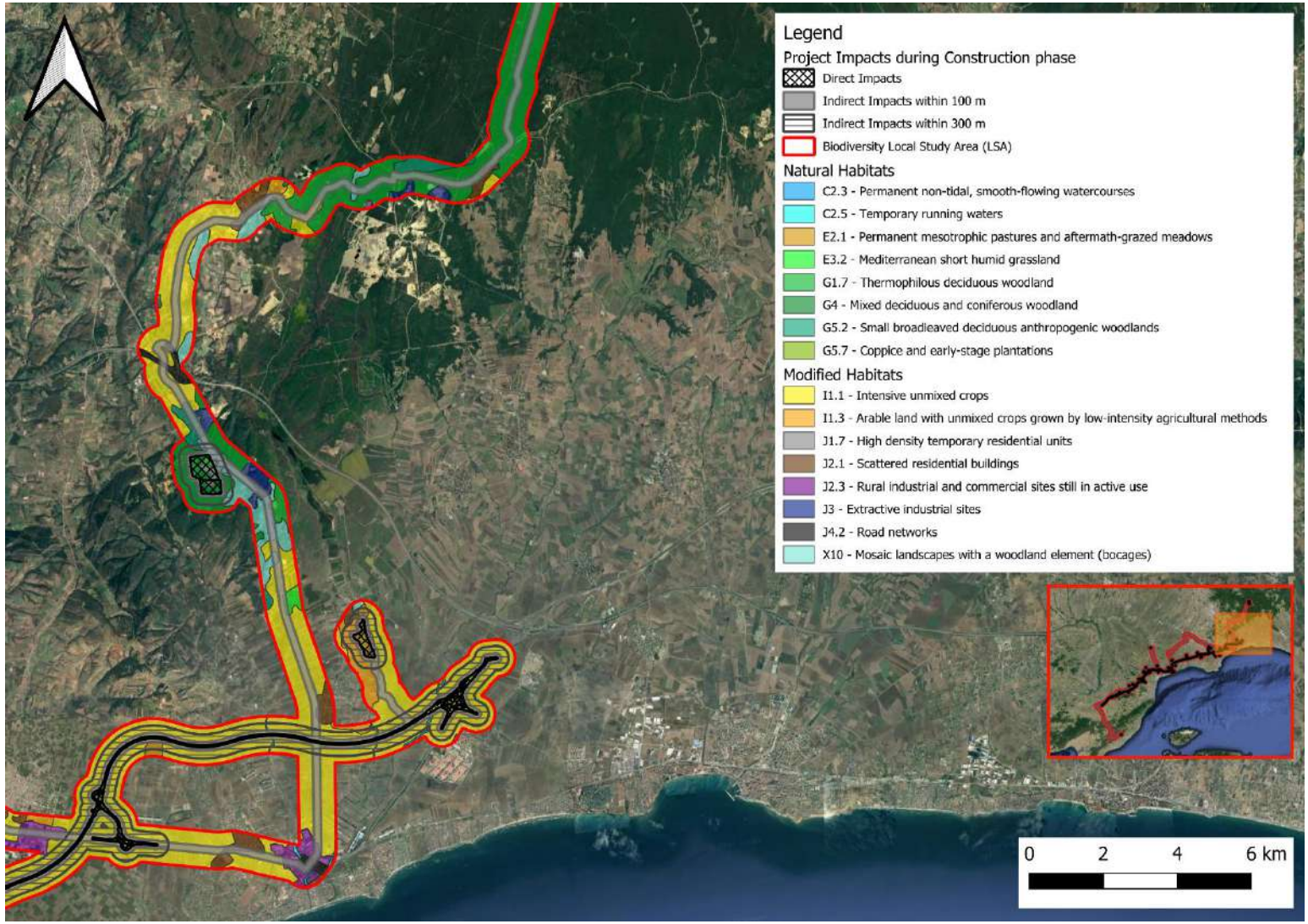



**Figure 252: Map of the potential direct and indirect construction impacts on EUNIS habitats (Map 5 out of 6)**

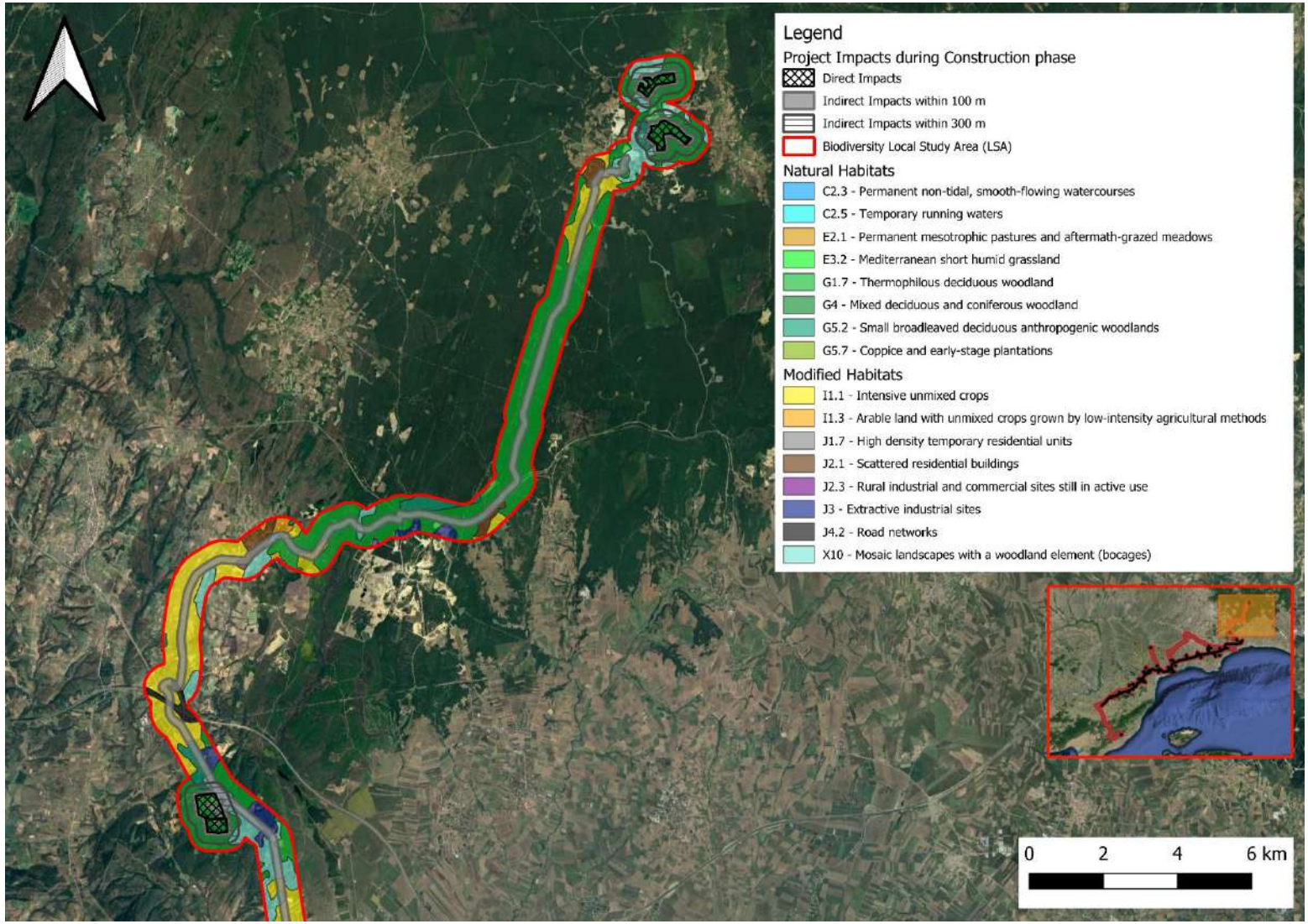



**Figure 253: Map of the potential direct and indirect construction impacts on EUNIS habitats (Map 6 out of 6)**

### 7.2.1.1 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and are proposed for the construction phase for the entire area that will be disturbed by the Project:

#### 7.2.1.1.1 Avoidance

Avoidance measures were and will be considered during the facilities designs, and include:

- A comprehensive options appraisal/analysis of alternatives for all quarries and associated facilities will be conducted to assess their suitability and potential impacts, including biodiversity considerations and other relevant factors, prior to any decision-making regarding facility selection. As a primary principle, the location of quarries and associated facilities within areas designated for their biodiversity value (e.g., KBAs, IBAs) will be avoided. If no viable alternatives exist outside such areas, this will be demonstrated through a detailed option appraisal/analysis of alternatives, with clear consideration of biodiversity sensitivity, before any decisions are made regarding facility selection.

  The method, criteria, and timeframes for conducting the analysis of alternatives will be outlined in the Quarries and Associated Facilities Management Plan, which will be submitted prior to Financial Close. The analysis of alternatives will be performed for all associated facility sites, not only those located within biodiversity-sensitive areas.

- Option appraisal/analysis of alternatives will be undertaken also with the intent or assessing the possibility of relocating areas for associated facilities within modified habitats, in order not to insist on natural habitats, in particular grasslands, such as E2.1 (now indeed not included in the updated project LSA) and E3.2, which could host endemic or restricted-range species.

- Facility footprints will be minimized.

#### 7.2.1.1.2 Minimization

1) <u>Vegetation and topsoil removal:</u>

- limits of clearing and construction areas will be clearly signed or fenced in order to reduce the risk of footprint creep;

- in order to minimize the mortality, biological surveys (pre-construction surveys) will be implemented before vegetation clearance to identify and relocate fauna species. An expert wildlife ecologist will perform pre-construction surveys in the areas to be cleared (not earlier than 7 days before). The survey will focus on fauna species with limited mobility (e.g. reptiles and amphibians) that cannot move ahead of construction. If any of these species are observed, they will be collected by the ecologist and translocated to undisturbed but similar sites within the LSA.

- Pending its reuse, topsoil within the temporary facility footprint will be stripped before construction activities, appropriately stored, and used for restoration at the end of the construction phase. Topsoil storage areas will be signalled, covered to protect them from runoff and wind erosion. If the topsoil and stockpiles are stored for a long period of time (more than 1 years) the topsoil stockpiles will be seeded with appropriate methods to avoid erosion from wind/rain to protect the organic matter content. Seeding of stockpiles areas will be performed favouring fast growing and ground covering flora species able to minimize soil erosion and will be periodically checked for IAS;

- vehicle movement will be restricted to the existing roads that connect the construction sites with the surrounding areas and vehicle speed will be restricted to ≤35km/h. Off road driving will be prohibited in order to avoid any unnecessary disturbance of natural vegetation.

- if erosion phenomena are observed environmental engineering techniques will be put in place to stop the erosion and ensure soil protection and the development of natural vegetation. Environmental engineering techniques will include as appropriate: erosion control mat, live crib wall, rock mattresses, hydro seeding and afforestation with appropriate species etc.

2) Changes in local hydrology and water quality:

the same mitigation measures elaborated for Hydrogeology and Surface water (Section 7.1.9) are applicable. In addition, the following specific measures will be applied:

- culverts/channels will be used as appropriate in correspondence of river crossing or drainage features to avoid the interruption of waterways and drainage features and the formation of stagnant water. These culverts/channels will be implemented an installed in a way that will ensure the continuity of the water feature and will not constitute a barrier to fish movement;

3) Increase in vehicular traffic:

- install speed limits and animal crossing signs on the access roads and enforce speed limits along the site access road;
- avoid the accumulation of stagnant water and organic waste within the construction site roads, that could attract wildlife;
- if employees and contractors encounter a fauna specimen while driving or mobilizing equipment, they will wait until it moves on by itself or they will ask the assistance of the Environmental technician for its safe removal and relocation in a suitable environment;
- raise awareness among employees and contractor mobilizing equipment on site about the protected species/habitats potentially present in the area, in order to ensure constant monitoring and promote actions to be taken if wildlife is encountered.

4) Emission of pollutants, dust and particulate matter:

- Speed limit for all vehicles will be implemented so as not to generate dust emissions, and all trucks will be properly maintained at all times;
- Any unpaved access roads will be adequately compacted and periodically graded, maintained, and sprayed with water as needed, to minimize dust from vehicle movements. If water spraying is deemed insufficient, other means of surface treatment (e.g., hygroscopic media, such as calcium chloride, and soil natural–chemical binding agents) for unpaved access roads, or exposed stockpiles, will be implemented, by using a sprinkler system or a “water-mist cannon”;
- Soil and any dusty material temporary stored on site will be appropriately covered and managed to control dust emissions;
- If the topsoil and soil stockpiles are stored for a long period of time (more than 1 year), they will be planted with appropriate methods in order to avoid erosion from wind and rain, and to protect the organic matter content;
- Excavations will be stopped in the event of strong winds (generally wind speeds of 10 m/s or more).

5) Emission of noise and vibrations:

the same mitigation measures elaborated for Noise (Section 7.1.9) are applicable to this impact factors. In addition, the following specific measures will be applied:

- night works will be avoided (from 8 pm to 6 am) in proximity of natural habitats to reduce impacts to nocturnal fauna species;
- rock blasting activities will be performed during daytime and at regular times to enhance local fauna habituation to noise and to avoid disturbance during critical hours for many species (dusk and dawn);
- blasting activities in the quarries will be interrupted during periods of importance for the passage of migratory bird species.

6) Introduction and spreading of alien species:

- the use of non-native flora species, and especially of species classified as invasive alien species must be avoided during rehabilitation/restoration works;
- if spreading of invasive species is observed, an appropriate eradication program will be developed and implemented.

#### 7.2.1.1.3 Rehabilitation/Restoration

Areas cleared during construction for temporary use, such as quarries, borrow sites, storage area for excess excavated material and blasting areas, will be restored, as soon as possible, with the goal of producing a stable vegetative cover to minimize erosion, dust and spreading of invasive alien species, and the aim of re-establish the original habitat with a positive impact on biodiversity.

Vegetation and topsoil restoration activities will be performed on all temporary facilities, which account for a total of 874.16 ha, including 560.78 ha for storage areas, 153.66 ha for quarries, 99.48 for borrow pits, 25.46 ha for sub-construction sites, 21.87 ha for camp sites and 12.91 ha for concrete plants.

Only plants that are native to the region will be used for restoration, soil improvement, erosion control, stream banks and habitat rehabilitation. Seeding and planting of grass shrubs and tree species typical of the local vegetation species, such as grasslands and mixed forest vegetation succession, will be used to ensure optimal ground cover. The action is expected to produce positive effects on local flora, fauna and habitats.

### *7.2.1.2 Residual impacts*

Considering the application of the abovementioned mitigation measures, the impact on biodiversity components is expected to be **Low**, as presented in Table 239 below**.**

The main residual impacts on biodiversity and natural habitats could derive from vegetation removal, but also with a lower score from introduction and spreading of alien species, changes in local hydrology, emission of pollutants, dust and particulate matter, as well as increase in vehicular traffic.

In order to monitor these impacts, mitigation measures are suggested in the following chapter.

**Table 239: Residual impact assessment matrix for biodiversity component and Natural Habitats, during the construction phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Vegetation and topsoil removal | Duration: | Medium-long | Medium | Mid term | **Medium** | Medium | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| | Intensity: | Medium | | | | | |
| Changes in local hydrology | Duration: | Medium-long | Medium | Short-mid-term | **Low** | Medium-high | **Negligible** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Increase in vehicular traffic | Duration: | Medium-long | Medium | Short-mid-term | **Low** | Medium-high | **Negligible** |
| | Frequency: | Moderately frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Medium-long | Medium | Short-term | **Low** | Medium | **Negligible** |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Emission of pollutants, dust and particulate matter | Duration: | Medium-long | Medium | Short-mid-term | **Low** | Medium | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Medium-long | Medium | Mid term | **Medium** | Medium | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### *7.2.1.3 Monitoring measures*

The following monitoring activities are foreseen in natural habitats to ensure the implementation and effectiveness of the proposed mitigation measures:

- Comprehensive pre-construction habitat verification surveys will be conducted to identify and confirm all areas of natural and critical habitat that may be impacted, taking into consideration the seasonality for the collection of detailed information on biodiversity. These surveys will ensure a thorough assessment of all such areas. The findings of the survey will be used to update the already developed BMP. The methodology of the pre-construction habitat verification survey will be developed along with details of personnel who will conduct the surveys (eg flora and habitat biodiversity specialist etc) and the planned dates (considering seasonal requirements) and will be presented in BMP.

- Additional pre-construction field survey specifically targeting birds and including survey locations within the footprint of Danamandıra Limestone Quarry, which falls inside Terkos Basin IBA.
- Indirect and direct inadvertent impacts on natural habitats and river crossing present around the construction site will be monitored monthly in order to assess eventual footprint creep outside designated areas;
- Accidents involving wildlife or the observation of live animal or carcasses along the access road or on the construction site will be recorded. Additional mitigation measures to discourage wildlife presence on site and avoid roadkill will be taken if needed;
- Presence of target species individual
- The presence of signs of erosion or stagnant water accumulation, waste or hazardous substances spill will be monitored within and around the construction sites at least every three months during construction;
- Presence and spreading of invasive flora species within and around the construction sites will be monitored at least twice a year during the vegetative season by an expert botanist, if necessary, control campaigns will be put in place in order to avoid the spreading of the invasive species.

#### *7.2.1.4 Critical Habitat*

##### 7.2.1.4.1 Flora species triggering CH

The potential impacts on flora species triggering CH are associated with the following impact factors:

- vegetation and topsoil removal;
- introduction and spreading of alien species.

The effects of impact factors and general mitigation measures for overall biodiversity were described in the previous chapters, while the potential direct and indirect impact that could occur on flora species triggering CH are summarized in Table 240 below.

Additional studies and mitigation measures are discussed whenever necessary and residual impacts are also assessed below. Monitoring measures are presented in chapter 0.

The no net loss/net gain assessment is discussed in chapter 7.2.4 including potential offset measure Net Gain.

**Table 240: Potential direct and indirect impact during construction phase on flora species triggering CH and additional mitigation measures**

| Species | National IUCN status End. / RR | Potential Direct and Indirect Impacts | Additional Measures |
|---|---|---|---|
| *Cirsium baytopae* | EN, Regional Endemic/RR | Direct impacts due to vegetation and topsoil removal and introduction/spreading of alien species will affect the population found in station SP11 (10 individuals) which is located within the footprint of a storage area (Depo-15 Kiniklar).<br>Indirect impacts could affect the populations of the species found in:<br>• SP08 (1 individual) located at 183 m from the expropriation corridor;<br>• SP09 (15 individuals) located at 178 m from the expropriation corridor;<br>• SP10 (10 individuals) located at 270 m from the expropriation corridor;<br>• SP12 (5 individuals) located at 80 m from the expropriation corridor;<br>• SP15 (2 individuals) located at 7 m from the expropriation corridor. | Mitigation measures for populations directly and indirectly impacted by the Project:<br>• Flora On-site Conservation (minimization): within the construction site, the conservation of the CH determining species shall be guaranteed to the extent possible. The individuals of this species not directly impacted by the Project footprint Population located within 100 m from construction or operation areas will be actively protected from any indirect impact. The areas in which populations of CH species are present will be treated as “Exclusion zones” where soil and vegetation will be preserved, and access will not be allowed to the maximum possible extent. These areas will be clearly identified both on maps and in the field.<br>• Flora Salvaging and Translocation (minimization/restoration): in case direct impacts will be unavoidable, individuals belonging to the flora species determining CH impacted by the Project footprint shall be identified, salvaged prior to construction and translocated to the appropriate sites.<br>• Seed collection (restoration/offset): seed collection and conservation will be performed for the CH determining species, following the best practice indicated by the Millennium Seed Bank. Seeds collected will be separately stored using clearly identifiable codes and will be donated to the Ankara Seed Gene Bank and, if needed, germinated and used to create new populations. |

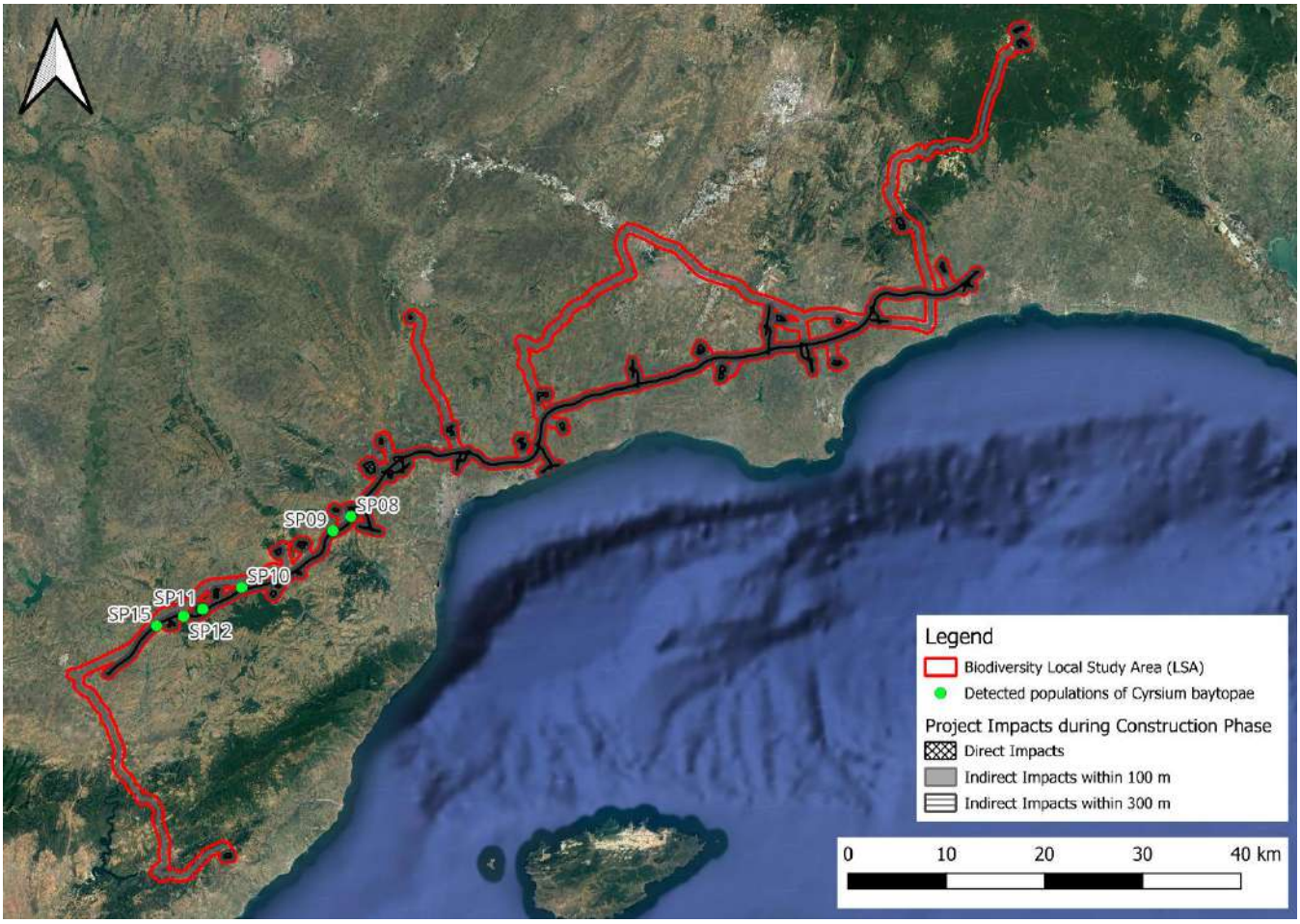



**Figure 254: Locations of the populations of Cirsium baytopae and potential direct and indirect impacts during Construction phase**

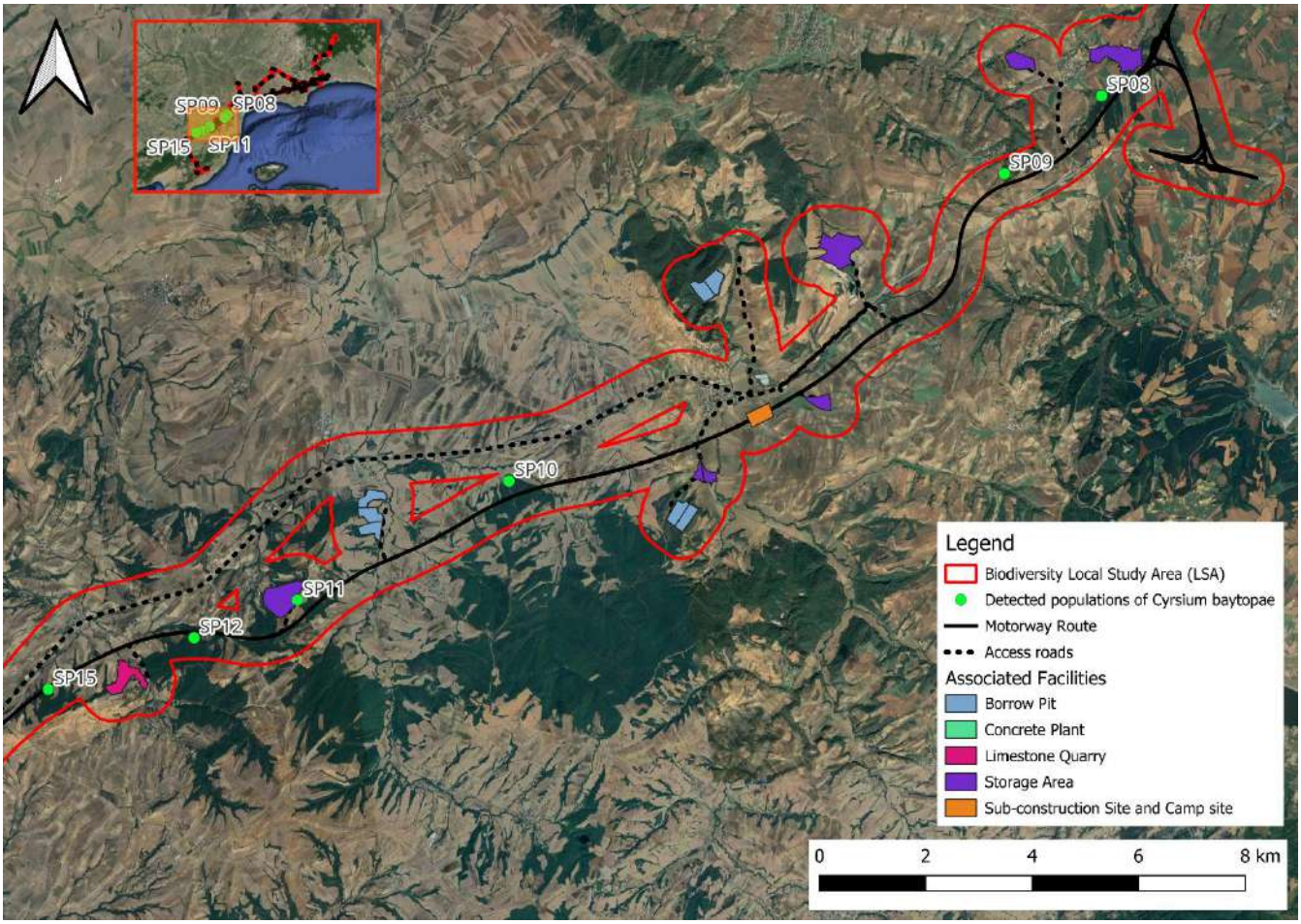



**Figure 255: Locations of the populations of Cirsium baytopae in relation to Project Footprint during Construction phase**

According to the baseline study performed, the general sensitivity is considered to be **High** for flora species triggering CHs.

Considering the application of the abovementioned mitigation measures, the impact on biodiversity components is presented in Table 241 below and it is expected to be **Low** for the flora species triggering CH identified within the LSA.

**Table 241: Residual impact assessment matrix for flora species triggering CH in the LSA during construction phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Vegetation and topsoil removal | Duration: | Medium-long | High | Long term | **High** | Medium-high | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Medium-long | High | Mid term | **Medium** | Medium-high | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

## Fauna species triggering CH

The Project activities that could mainly affect fauna species during the construction phase are:

- vegetation and topsoil removal;
- increase in vehicular traffic;
- emission of pollutants, dust and particulate matter;
- emission of noise and vibrations.

The effects of impact factors and general mitigation measures for overall biodiversity were described in the previous chapters, while the potential direct and indirect impact that could occur on mammal species triggering CH are summarized in the Table 242 below.

Additional studies and mitigation measures are discussed whenever necessary and residual impacts are also assessed below. Monitoring measures are presented in chapter 0.

The no net loss/net gain assessment is discussed in chapter 7.2.4 including potential offset measure Net Gain.

**Table 242: Potential direct and indirect impact during construction phase on fauna species triggering CH and additional mitigation measures**

| Taxon | Scientific Name | Common Name | Global IUCN | End. / RR | Obs./ Lit. | Potential Direct and Indirect Impacts | Additional Measures |
|---|---|---|---|---|---|---|---|
| Mammals | *Spermophilus citellus* | *European Souslik* | EN | - | L | The presence of the species within the LSA has not been confirmed during June 2022 surveys.<br>Direct (e.g vegetation and topsoil removal and vehicular traffic) and indirect impacts within 100 m and 300 m buffer could affected this species habitat if not properly mitigated. | <u>Additional mitigation measures for populations directly and/or indirectly impacted by the Project</u>:<br><u>Salvaging and Translocation</u>:<br>• Where direct impacts are unavoidable pre-construction surveys will be performed by biodiversity experts to identify and in case relocate the individuals of *S. citellus.* If the presence of *S. citellus* is confirmed, individuals in habitat patches directly impacted by the project will be identified and captured by experts using specific traps (e.g. the Donski trap[213]) prior to construction and relocated to appropriate sites;<br>• Nesting sites of the two target bird species may be found in marshes, lakes and slow-flowing rivers (C2.3 and C2.5 in the LSA). If the presence of nesting site belonging to target bird species is confirmed, works shall be postponed in that area until the breeding cycle is completed (April-May for *A. ferina* and June-July for *B. ruficollis*). A species-specific buffer zone will be set up around the nest site following consultation with a qualified ecologist.<br><u>Implementation of "wildlife friendly" lighting solutions to reduce potential migratory bird attraction and impact on nocturnal birds</u> (minimization) |
| Birds | *Aythya ferina* | Common Pochard | VU | - | L | The presence of the species within the LSA has not been confirmed during June 2022 surveys. However, it is reported as breeding in the Terkos Basin IBA located at 5 km east of the Project (20 estimated breeding pairs).<br>Direct (e.g vegetation and topsoil removal and vehicular) and indirect impacts within 100 m and 300 m buffer could affected this species habitat if not properly mitigated. | |

[213] Koshev, Y., Kachamakova, M., Arangelov, S., & Ragyov, D. (2019). Translocations of European ground squirrel (Spermophilus citellus) along altitudinal gradient in Bulgaria–an overview. *Nature Conservation*, *35*, 63.

| Taxon | Scientific Name | Common Name | Global IUCN | End. / RR | Obs./ Lit. | Potential Direct and Indirect Impacts | Additional Measures |
|---|---|---|---|---|---|---|---|
| | *Branta ruficollis* | Red-breasted Goose | VU | - | L | The presence of the species within the LSA has not been confirmed during June 2022 surveys. However, the species is reported as wintering in the Terkos Basin IBA located at 5 km east of the Project (90 estimated individuals).<br><br>Direct (e.g vegetation and topsoil removal) and indirect impacts within 100 m and 300 m buffer could affected this species habitat if not properly mitigated. | • The lighting type, direction and level will be planned in order to ensure a level of light required for the safety of the workers and the safety of the equipment while minimizing the luminous level (e.g. usage of green "bird friendly" light bulbs, implementation of light shields, etc.).<br><br>Mitigation measures for planned biodiversity during the construction phase are considered sufficient to mitigate indirect impact.<br><br>If necessary, Biodiversity Action Plan will include appropriate offset measure to ensure Net Gain depending on the residual impacts identified during the additional studies and monitoring. |

According to the baseline study performed, the general sensitivity is considered to be **High** for terrestrial fauna species triggering CHs.

Considering the application of the abovementioned mitigation measures, the impact on biodiversity components is presented in Table 243 below and it is expected to be **Low** for the terrestrial fauna species triggering CH identified within the LSA.

**Table 243: Residual impact assessment matrix for fauna species triggering CH in the LSA during construction phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Vegetation and topsoil removal | Duration: | Medium-long | High | Long term | **High** | Medium-high | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Increase in vehicular traffic | Duration: | Medium-long | High | Short-mid-term | **Medium** | Medium-high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of pollutants, dust and particulate matter | Duration: | Medium-long | High | Short-mid-term | **Medium** | Medium-high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Medium-long | High | Short-term | **Low** | Medium | **Low** |
| | Frequency: | Highly frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

## Monitoring Measures

The following additional monitoring measures are considered appropriate for species triggering CH during construction:

- **Terrestrial Flora Species triggering CH**
  - Additional critical habitat verification surveys

    Additional habitat verification field surveys will be carried out within all the areas identified as critical habitats for triggering flora species in order to have validation of the critical habitats and to gather primary data on the quality of critical habitats (e.g. conservation level, degradation factors, degradation levels). The time planning for these surveys should also take into consideration the seasonality for the collection of detailed information on biodiversity. For this reason, April-June would be the best period for observing flora species during the flowering period.

  - Flora Salvaging and Direct Translocation

Translocation sites identified for species shall be monitored periodically for any sign of stress or disturbance. During the first two years after translocation monitoring shall occur monthly during the vegetative season. After the first two years monitoring shall occur every three months during the vegetative season (unless particular issues are recorded during previous monitoring).

- Flora On-site Conservation

  On-site Conservation Areas identified for flora species shall be monitored periodically and any signs of disturbance will be noted (e.g. trampling, dust deposition, soil erosion, presence of stagnant water). During Construction monitoring shall occur monthly.

- Seed collection

  The number of seeds collected and their viability shall be tested in order to assess the need of additional collection campaigns.

- **Terrestrial fauna Species triggering CH**

  - Additional critical habitat verification surveys

    Additional habitat verification field surveys will be carried out within all the areas identified as critical habitats for triggering fauna species in order to have validation of the critical habitats and to gather primary data on the quality of critical habitats (e.g. conservation level, degradation factors, degradation levels). The time planning for these surveys should also take into consideration the seasonality for the collection of detailed information on biodiversity. For this reason, April-June would be the best period for observing fauna species during full activity period.

  - Salvaging and Translocation:

    Translocation sites identified for *Spermophilus citellus* shall be monitored periodically for any sign of stress or disturbance. During the first two years after translocation monitoring shall occur monthly during the species activity season. After the first two years monitoring shall occur once a year during the activity season of the species (unless particular issues are recorded during previous monitoring). It would be important to check the status of the suitable habitat for the species at each site identified for the translocation.

### 7.2.2 Operation Phase

The potential impacts on biodiversity deriving from the above actions are associated with the following **impact factors**:

1) presence of new buildings/infrastructures;
2) changes in local hydrology and water quality;
3) Highspeed motorway traffic;
4) emission of noise and vibration;
5) emission of light;
6) Introduction and spreading of alien species.

The direct impacts are expected within footprint of the Project and of the permanent associated facilities (camp sites, storage areas, borrow pits, limestone quarries, concrete plants, sub-construction sites). Indirect impacts were conservatively considered within a buffer of 100 and 300 meters from the footprint of the project and the facilities.

All the impact factors identified above are described and discussed in the following assessment.

1) Presence of new buildings/infrastructures

The areas affected by this impact factor will be limited to the Project footprints, including permanent associated facilities (switchyard and stations). Considered the width of a single lane (3.75 m) and the number of lanes (2 lanes for each side plus an emergency lane for a total of 6 lanes), a corridor of 25 m drawn as buffer the Project Route was defined as the footprint of motorway during the operation phase.

Temporary facilitates such as camp sites, storage areas, borrow pits, limestone quarries, concrete plants and sub-construction sites are planned to be restored after the construction phase. However, the restoration of these areas, that amount to a total of 874.16 ha must be carefully monitored to make sure the target is met.

The presence of permanent facilities will cause a loss of available natural habitat during the entire operation phase that will directly and indirectly affect habitats, flora and fauna species.

In addition, the presence of the new linear infrastructure may cause habitat fragmentation on many patches of natural habitats that may not be able to maintain viable populations in the long run (Fahrig 2003[214]). Motorways can be both physical and behavioural barriers to wildlife movement. In fact, this is considered one of the most significant impacts of motorways.

2) Changes in local hydrology and water quality

If not properly planned, motorway river crossing may cause fragmentation of freshwater habitat since culvert, causeways and bridges structures may also constitute a barrier to fish movement. Although these barriers mostly cause local impediments to fish passage, the ubiquity of such small barriers has cumulative river basin-scale effects (Rodgers *et al.*, 2014[215]). Together with the many tidal barrages and floodgates that control flows and alter fish abundance, biomass and community structure (Williams and Watford, 1997[216]; Kroon and Ansell, 2006[217]; Boys *et al.* 2012[218]), road crossings play major roles in obstructing fish migrations (J. H. Harris, 2016[219]).

Erosion phenomena may cause releasing of sediment into the water which leads to a change in water quality (e.g. dissolved oxygen) and a loss in nursery habitat caused by silt deposition and accumulation. At the end of the construction phase stream and river crossing will be fully rehabilitated, therefore effects on freshwater habitats are expected to be minimal.

[214] Fahrig, L., 2003. Effects of Habitat Fragmentation on Biodiversity. Annual Review of Ecology, Evolution, and Systematics. 34. 487-515.

[215] Rodgers Essie M., Cramp Rebecca L., Gordos Matthew, Weier Anna, Fairfall Sarah, Riches Marcus, Franklin Craig E., 2014. Facilitating upstream passage of small-bodied fishes: linking the thermal dependence of swimming ability to culvert design. Marine and Freshwater Research 65, 710-719.

[216] Williams, R., Watford, F., 1997. Identification of structures restricting tidal flow in New South Wales, Australia. Wetlands Ecology and Management 5, 87–97.

[217] Frederieke J Kroon and Dean H Ansell. A comparison of species assemblages between drainage systems with and without floodgates: implications for coastal floodplain management. Canadian Journal of Fisheries and Aquatic Sciences. 63(11): 2400-2417.

[218] Boys, C.A., Kroon, F.J., Glasby, T.M. and Wilkinson, K., 2012. Improved fish and crustacean passage in tidal creeks following floodgate remediation. Journal of Applied Ecology, 49: 223-233.

[219] Harris J. H., Kingsford R. T., Peirson W., Baumgartner L. J., 2017. Mitigating the effects of barriers to freshwater fish migrations: the Australian experience. Marine and Freshwater Research 68, 614-628.

The incidental introduction of pollutants from motorway operation and maintenance is another potential threat to freshwater habitats. Terrestrial fauna species, especially invertebrate fauna, could also be impacted by degraded water quality.

Using a precautionary approach, a 100 m buffer is considered around project facilities in correspondence of aquatic habitats.

3) Motorway traffic

Direct impacts on wildlife related to the motorway presence include mortality due to vehicle collisions and secondary effects such as preventing traditional movements or severing links between populations. Indeed, motorways and highways with traffic above 10,000 vehicles per day impose an impermeable barrier to many wildlife species, as the dense traffic repels most species approaching the road and kills those attempting to cross[220]. More in general, traffic can have an important influence on wildlife behaviour, distribution, territory use, local populations (Forrest and Sr. Clair, 2009[221]).

During the operational phase, vehicle traffic is expected to increase significantly compared to baseline conditions. The potential impacts resulting from this impact factor are practically the same as those described for the construction phase (Chapter 7.2.1).

4) Emission of noise and vibration

Noise levels vary, depending on the landscape and weather, open and flat areas allow noise to travel further than forest or mountains areas.

Research has been inconclusive regarding noise effects on wild and domestic animals from transportation noise sources (Hanson C.E., 2008[222]). The emission of noise and vibration is relevant during the operational phase, but in the long term it also can be defined more usual and “predictable” in time and space. In fact, animals exposed to prolonged or repeated human disturbance may eventually adapt both behaviourally and physiologically and become “habituated” (Petrinovich, 1973[223]). Additionally, the fact that the noise from vehicles using the motorway is not associated with an immediate risk suggests that the animals are able to habituate to the sound.

In general, once animals become habituated to noise, especially when it is steady and associated with clearly non-threatening activity, they seem to suffer very little adverse response. In light of this, during the operations phase the following effects are expected on local fauna:

- likely change in species composition in the LSA, with less noise-tolerant species moving further away to avoid areas of high noise;
- selection for more noise tolerant individuals within the population of species closed to the project;
- habituation of some species and individuals to the noise impacts.

[220] Seiler, A. (2001). Ecological effects of roads: a review. Uppsala: Swedish University of Agricultural Sciences.

[221] Forrest, A., & St. Clair, C., 2009. Impacts of vehicle traffic on the distribution and behaviour of rutting elk, Cervus elaphus. Behaviour, 146(3), 393-413.

[222] Hanson, C. E., 2008. High speed train noise effects on wildlife and domestic livestock. In Noise and vibration mitigation for rail transportation systems (pp. 26-32). Springer, Berlin, Heidelberg.

[223] Petrinovich, L., 1973. A species-meaningful analysis of habituation. Habituation: behavioural studies, 1, 141.

Noise levels up to 60 dBA generally results in little to no negative or adverse response to animals or livestock, while has a much greater effect on wildlife (Warren et al., 2006[224]; Fletcher et al., 1971[225]). Although the vibrations of vehicles can be felt along the motorway and this may give warning to some terrestrial vertebrates (Heske, 2015[226]), the effects of noise disturbance from human activity on wildlife are mostly perceived over short distances in a species- specific way (up to ~ 300 m, Reijnen et al., 1995[227]; Canaday and Rivadeneyra, 2001[228]). Therefore, using a precautionary approach, a 300 m buffer is considered along the motorway.

5) Emission of light

Lights can have an attracting effect on night-flying wildlife, which would result being attracted towards the permanent infrastructures, with subsequent risk of collision. In addition, ecological light pollution can affect fauna species foraging and their reproductive behaviour, biological clocks, predator-prey interactions, movement and dispersal patterns, community structure, and interactions among and within species (Longcore & Rich, 2004[229]).

Effects are likely species-specific, based on the role ambient light plays in physiology and behaviour, and might also depend on the type of lighting used. The taxa that are more likely to be affected by light pollution are bats, nocturnal birds, and insects. Depending on the species, bats are either attracted to lights by the presence of insects or they avoid lighted areas. Species of reptiles, amphibians, birds, bats and spiders have been shown to wait around artificial lights for prey. Using a precautionary approach, a 300 m buffer is considered along the motorway.

6) Introduction and spreading of alien species

Habitat changes also take place in motorway corridors, as their verges commonly differ from the surrounding landscape. These changes can be exploited by generalist species or by opportunistic individuals, using them as shelters or corridors. They can be used by invasive species as well.
Roadside verges, in fact, are often colonized by invasive alien species due to their ecological characteristics. Invasive alien species tend to have an advantage in disturbed ecosystems, and if they encroach upon a habitat, they can potentially change its functionality and species composition, including priority biodiversity species. In some cases, invasive alien species are even used for rehabilitation and consolidation of the motorway slopes and, given suitable conditions, can than expand into the surrounding habitat.

Local fauna that depends on those ecosystems could also be indirectly affected. The habitats around the construction sites could experience a decrease in biodiversity in the immediate vicinity of the roads, with a consequent trivialization (potential appearance of more dominant species) of the ecosystem in a small buffer area close to the roads with a higher traffic.

Using a precautionary approach, a 300 m buffer around the Project facilities is considered for this impact factor.

[224] Warren, P. S., Katti, M., Ermann, M., & Brazel, A. (2006). Urban bioacoustics: it's not just noise. Animal behaviour, 71(3), 491-502.

[225] Fletcher, J. L., Harvey, M. J., & Blackwell, J. W. U. S. (1971). Effects of noise on wildlife and other animals. Washington: US Environmental Protection Agency, Government Printing Office, 74.

[226] Heske, E. J., 2015. Blood on the tracks: Track mortality and scavenging rate in urban nature preserves. Urban Naturalist, 4, 1–13.

[227] Reijnen, R., Foppen, R., Braak, C. T., & Thissen, J., 1995. The Effects of Car Traffic on Breeding Bird Populations in Woodland. III. Reduction of Density in Relation to the Proximity of Main Roads. Journal of Applied Ecology, 32(1), 187–202.

[228] Canaday, C., Rivadeneyra, J., 2001. Initial effects of a petroleum operation on Amazonian birds: terrestrial insectivores retreat. Biodiversity and Conservation 10, 567–595

[229] Longcore T. &Rich C. (2004). Ecological light pollution. Front. Ecol. Environ. 2004; 2[4]: 191– 198.

The effects of these potential impacts on biodiversity, and in particular on natural habitats, are quantified and discussed below. The areas potentially impacted are represented from Figure 256 to Figure 259 and their numerical estimation is presented in the Table 244 below.

Direct impacts during operation phase will impact 1% of the total LSA. The direct impacts will be mostly on modified habitats (423.26 ha) especially on agricultural fields (I1.1, 408.28 ha and I1.3, 6,80 ha 4.84 ha EUNIS habitat types).

The direct impacts during operation could potentially affect less than 1% (32.59 ha) of the total natural habitats in the LSA. They will be mostly concentrated on deciduous woodlands (G1.7, 15.46 ha and G5.2, 8.86 ha EUNIS habitat types) and meadows (E3.2, 4.12 ha EUNIS habitat type). The project will largely make use of existing access roads as such will minimize further habitat destruction/degradation.

Indirect impacts in the 100 m buffer impact a total of 8% of the LSA. Indirect impacts during operation in the 100 m buffer will be greater on modified than natural habitats (2,664.81 ha and 206.59 ha, respectively).

Indirect impacts within the 100 m buffer could potentially affect 4% (206.59 ha) of the total natural habitats. They will be mostly on deciduous woodlands (G1.7, 105.61 ha and G5.2, 33.78 ha EUNIS habitat types) and meadows (E2.1, 33.04 ha EUNIS habitat type), followed by freshwater courses (C2.5, 10.87 ha and C2.3, 4.15 ha EUNIS habitat types).

Indirect impacts in the 300 m buffer during operation could impact a total of 23% of the LSA. Indirect impacts during operation in the 100 m buffer will be greater on modified than natural habitats (7,718.13 ha and 526.21 ha, respectively) and mostly on agricultural fields (I1.1, 7,235.92 ha and I1.3 119.30 ha EUNIS habitat types).

Indirect impacts within the 300 m buffer could potentially affect 9% (526.21 ha) of the total natural habitats. They will be mostly on deciduous woodlands (G1.7, 252.81 ha and G5.2, 61.43 ha EUNIS habitat types) and meadows (E2.1, 102.27 ha EUNIS habitat type), followed by a lighter impact on early-stage plantations (G5.7, 51.69 ha EUNIS habitat type) and freshwater courses (C2.5, 47 ha and C2.3, 11.01 ha EUNIS habitat types).

**Table 244: Direct and indirect impacts on EUNIS habitats calculated within the LSA for the operation phase**

| Habitats | Total LSA | Direct Impacts within the Project Operation Footprint | | Indirect Impacts within 100 m from the Project Operation Footprint | | Indirect Impacts within 300 m from the Project Operation Footprint | |
|---|---|---|---|---|---|---|---|
| | ha | ha | % | ha | % | ha | % |
| **Natural Habitats** | | | | | | | |
| C2.3 - Permanent non-tidal, smooth-flowing watercourses | 68.07 | 0.34 | <1 | 4.15 | 6 | 11.01 | 16 |
| C2.5 - Temporary running waters | 111.49 | 1.33 | 1 | 10.87 | 10 | 47.00 | 42 |
| E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows | 1,251.79 | 4.12 | <1 | 33.04 | 3 | 102.27 | 8 |
| E3.2 - Mediterranean short humid grassland | 85.25 | 0.00 | - | 0.00 | - | 0.00 | - |
| G1.7 - Thermophilous deciduous woodland | 3,007.42 | 15.46 | <1 | 105.61 | 4 | 252.81 | 8 |
| G4 - Mixed deciduous and coniferous woodland | 295.11 | 0.00 | - | 0.00 | - | 0.00 | - |
| G5.2 - Small broadleaved deciduous anthropogenic woodlands | 589.70 | 8.86 | 2 | 33.78 | 6 | 61.43 | 10 |
| G5.7 - Coppice and early-stage plantations | 290.33 | 2.48 | <1 | 19.14 | 7 | 51.69 | 18 |
| *Subtotal* | *5,699.16* | *32.59* | *<1* | *206.59* | *4* | *526.21* | *9* |
| **Modified Habitats** | | | | | | | |
| I1.1 - Intensive unmixed crops | 25,969.24 | 408.28 | 2 | 2,531.82 | 10 | 7,235.92 | 28 |
| I1.3 - Arable land with unmixed crops grown by low-intensity agricultural methods | 672.70 | 4.84 | <1 | 36.21 | 5 | 119.30 | 18 |

| Habitats | Total LSA | Direct Impacts within the Project Operation Footprint | | Indirect Impacts within 100 m from the Project Operation Footprint | | Indirect Impacts within 300 m from the Project Operation Footprint | |
|---|---|---|---|---|---|---|---|
| | ha | ha | % | ha | % | ha | % |
| J1.7 - High density temporary residential units | 34.20 | 0.00 | - | 0.00 | - | 0.00 | - |
| J2.1 - Scattered residential buildings | 994.40 | 1.33 | <1 | 17.63 | 2 | 73.64 | 7 |
| J2.3 - Rural industrial and commercial sites still in active use | 471.72 | 0.00 | - | 0.00 | - | 0.27 | <0.1 |
| J3 - Extractive industrial sites | 176.72 | 0.35 | <1 | 2.31 | 1 | 8.17 | 5 |
| J4.2 - Road networks | 112.28 | 0.45 | <1 | 3.50 | 3 | 9.90 | 9 |
| X10 - Mosaic landscapes with a woodland element (bocages) | 2,393.13 | 8.01 | <1 | 73.34 | 3 | 270.93 | 11 |
| *Subtotal* | *30,824.39* | *423.26* | *1* | *2,664.81* | *9* | *7,718.13* | *25* |
| ***Total*** | ***36,523.55*** | ***455.85*** | ***1*** | ***2,871.40*** | ***8*** | ***8,244.34*** | ***23*** |

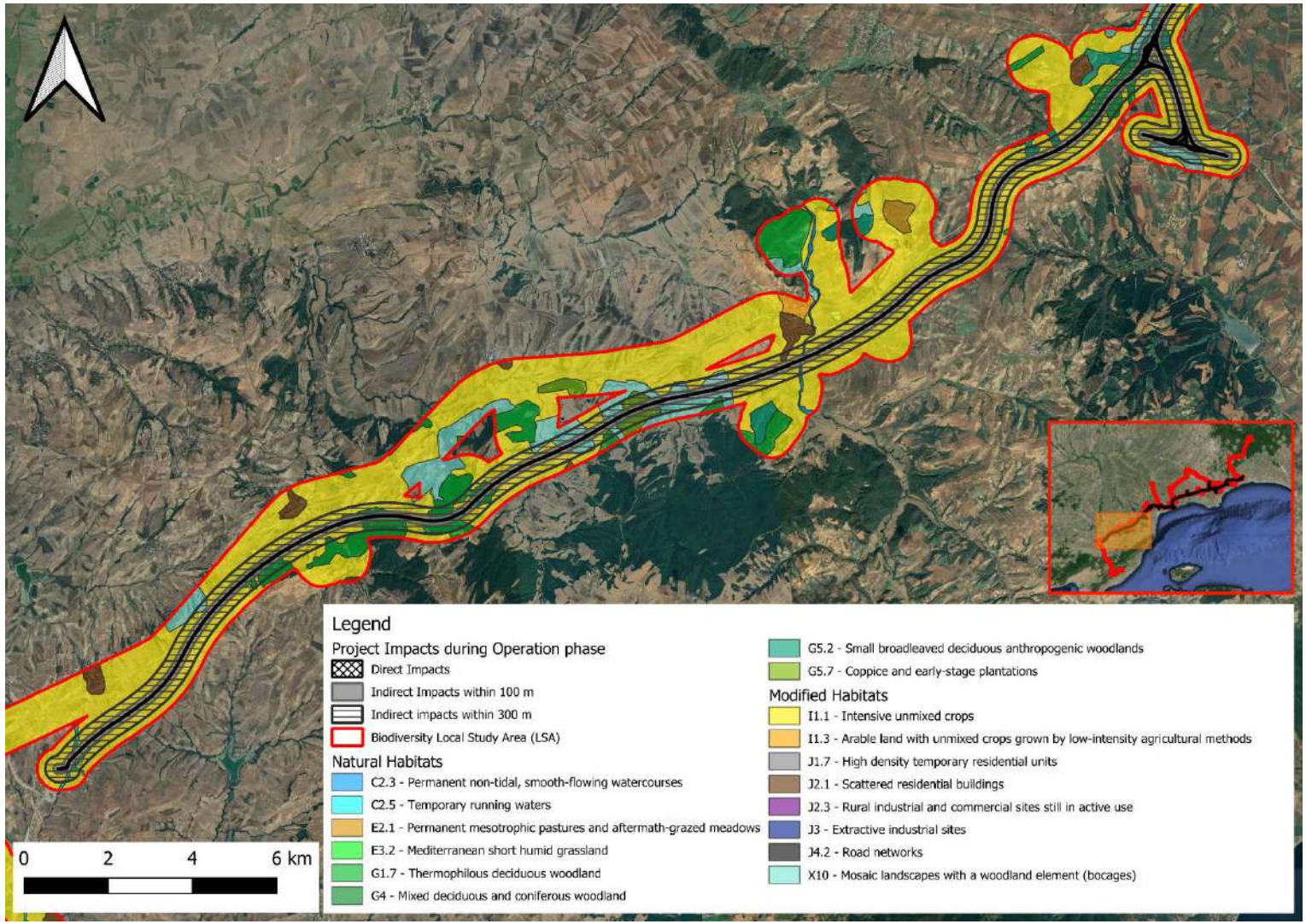



**Figure 256: Map of the potential direct and indirect operation impacts on EUNIS habitats (Map 1 out of 4)**

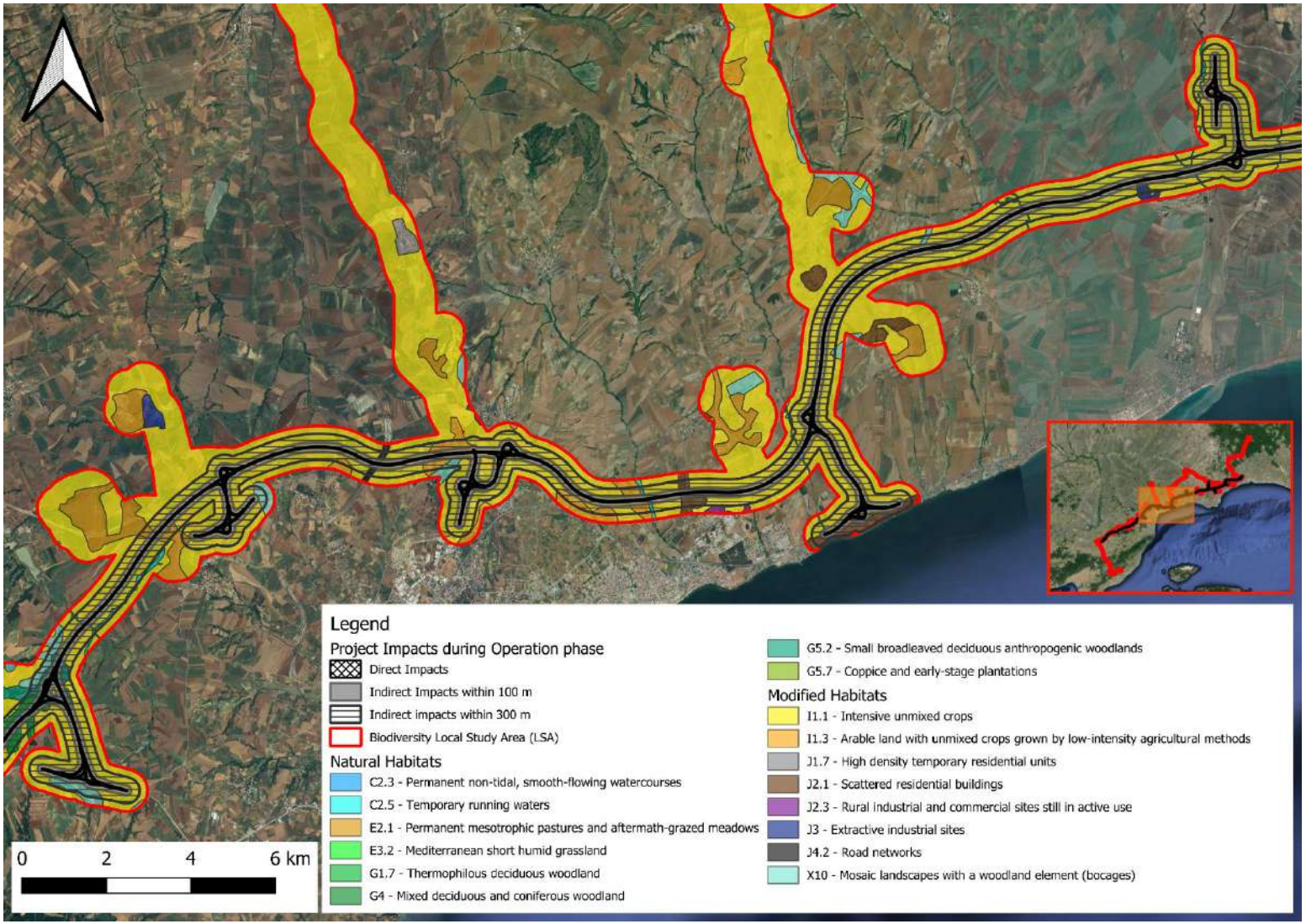



**Figure 257: Map of the potential direct and indirect operation impacts on EUNIS habitats (Map 2 out of 4)**

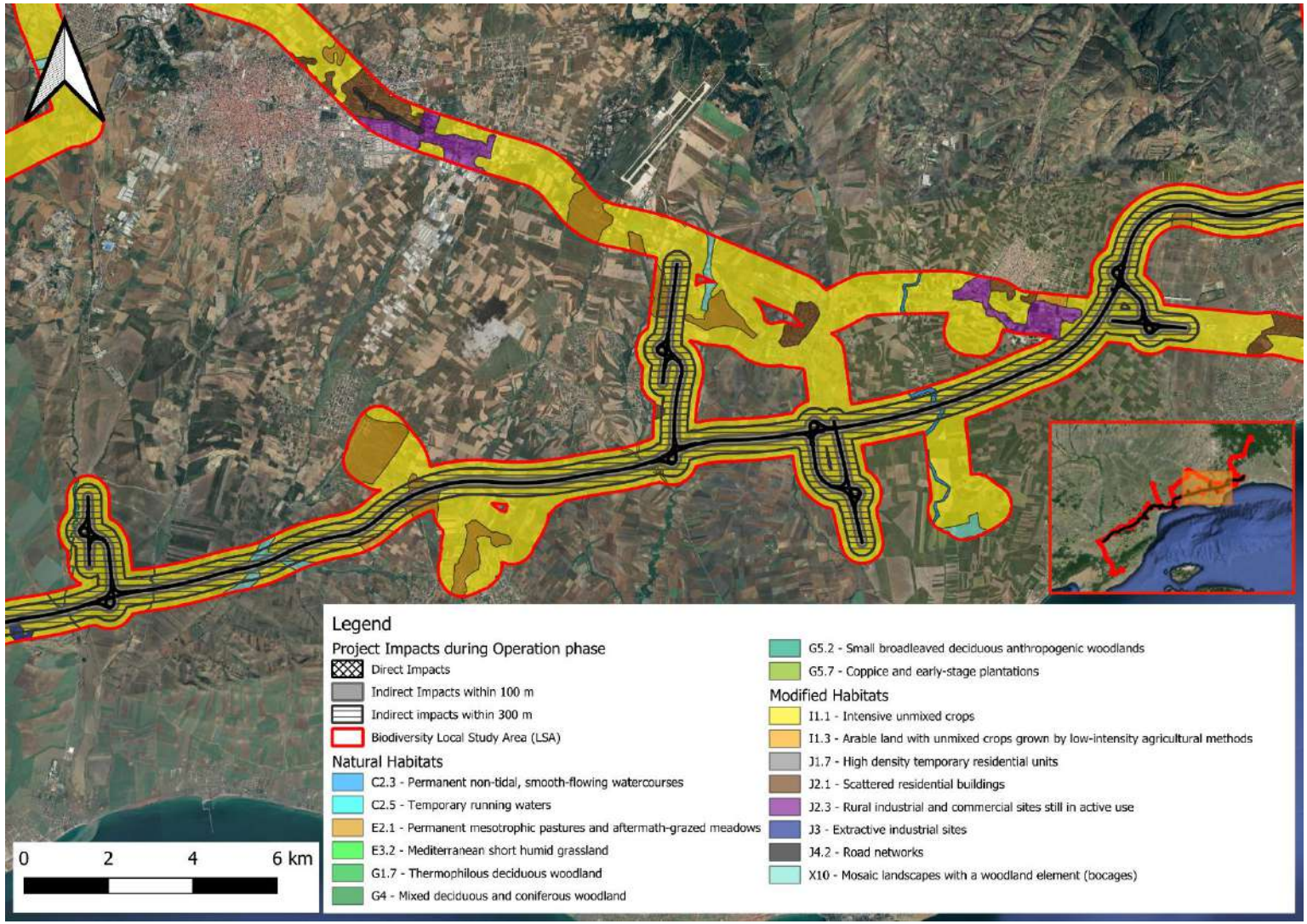



**Figure 258: Map of the potential direct and indirect operation impacts on EUNIS habitats (Map 3 out of 4)**

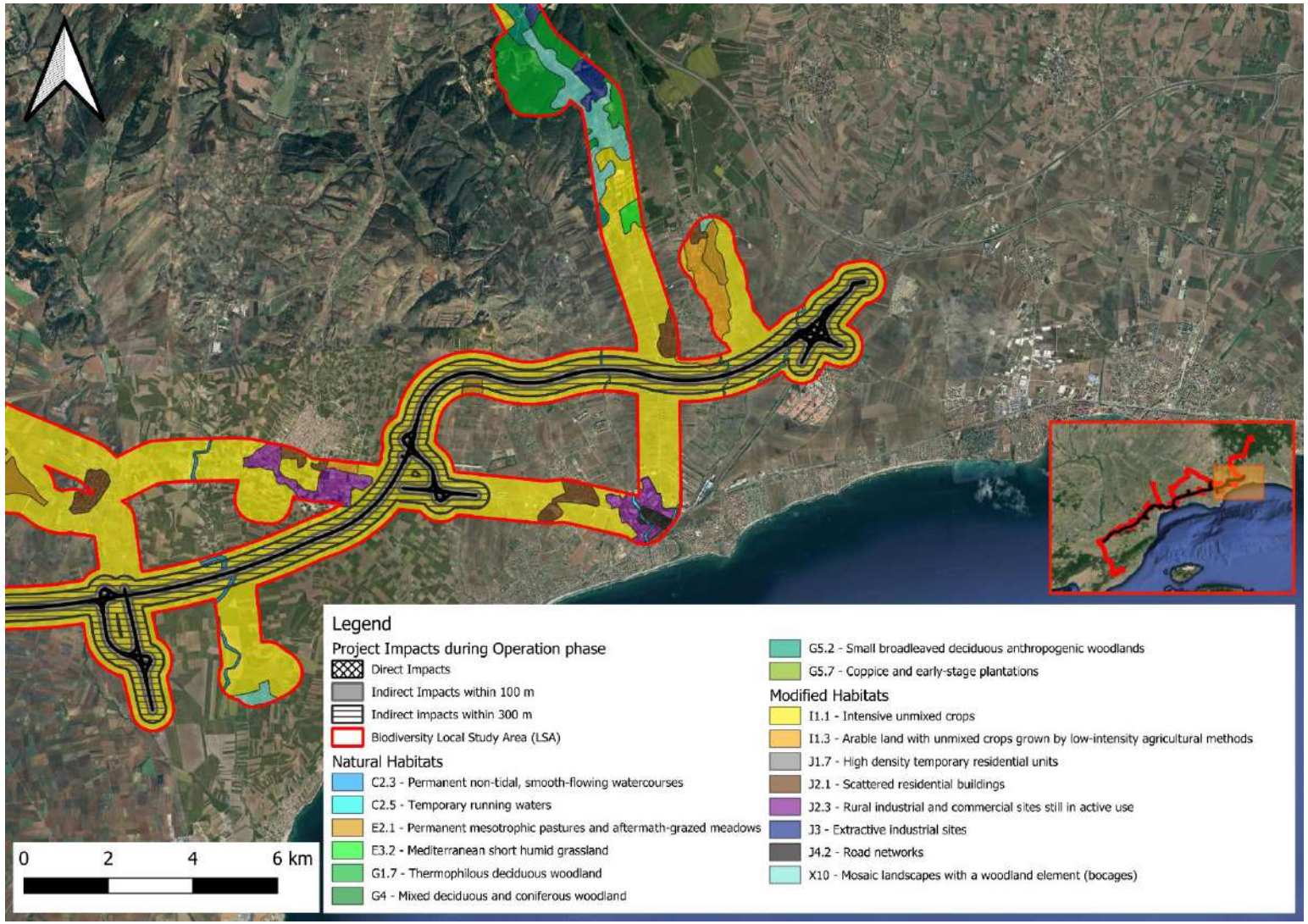



**Figure 259: Map of the potential direct and indirect operation impacts on EUNIS habitats (Map 4 out of 4)**

#### 7.2.2.1 Mitigation measures

The mitigation measures listed below follow the mitigation hierarchy and are proposed for the operation phase for the entire area that will be disturbed by the Project.

##### 7.2.2.1.1 Avoidance

Avoidance measures have been considered particularly during the facility designs and include:

- minimisation of the footprint of individual facilities.

##### 7.2.2.1.2 Minimization

1) Presence of new buildings/infrastructures:

- channels/culverts will be used as appropriate in correspondence of river crossing or drainage features to avoid the interruption of waterways and drainage features and the formation of stagnant water. These culverts/channels will be implemented an installed in a way that will ensure the continuity of the water feature and will not constitute a barrier to fish movement;
- based on monitoring results (see monitoring measure in chapter 7.2.2.3), additional mitigation measures could be possibly planned in specific motorway sections where wildlife crossings are plausible/expected: fencing of particular motorway sections to avoid wildlife crossing and conduct wildlife toward safe crossing locations, creation of underpasses or overpasses designed in a way to be conductive for wildlife;
- should engineering works be needed to reduce erosion phenomena, appropriate natural engineering techniques will be used to ensure soil protection and natural vegetation development (e.g. erosion control mat, live crib wall, rock mattresses, hydro seeding).

2) Changes in local hydrology and water quality:

- the same mitigation measures elaborate for Hydrogeology and Surface Water (Section 7.1.4) are applicable for this impact factor.

3) Highspeed motorway traffic:

- based on monitoring results (see monitoring measures in chapter 7.2.1.3), additional mitigation measures could be planned in specific motorway sections where wildlife crossings are reported;
- fencing of specific motorway sections to avoid wildlife crossing and to conduct wildlife toward safe crossing locations; creation of underpasses or overpasses;

4) Emission of noise and vibration:

- the same mitigation measures elaborated for Noise (Section 7.1.9);

5) Emission of light:

- it is recommended to keep the number of light sources to the minimum necessary to ensure driver safety;
- preferred types of lights for exterior lighting (e.g: lights on site due to security reasons) include:
  - Low pressure sodium lamps (SOX): orange lamps seen along roadsides;

  - Light emitting diodes (LEDs): light source of choice, emitted more directional, warmer color temperatures (~ 3000°K);
  - lights triggered by presence detectors, and lights oriented to the ground;
- the following types of lights should be avoided:
  - mercury lamps (MBF): bluish-white lamps (attract insects and tolerant bat species);
  - high pressure sodium lamps (SON): brighter pinkish-yellow lamps; used as road lighting;

6) Introduction and spreading of alien species:

- the use of non-native flora species, and especially of species classified as invasive alien species will be avoided during rehabilitation/restoration works;
- Should invasive species be observed, an appropriate control program will be developed and implemented.

#### 7.2.2.1.3 Rehabilitation/Restoration

Areas cleared during construction for temporary use, such as quarries, borrow sites, storage area for excess excavated material and blasting areas, will be restored, as soon as possible, with the goal of producing a stable vegetative cover to minimize erosion, dust and spreading of IAS, and the aim of re-establish the original habitat.

Only plants that are native to the region will be used for restoration, soil improvement, erosion control, stream banks and habitat rehabilitation. Seeding and planting of grass shrubs and tree species typical of the local vegetation species, such as short-grass steppes and mixed forest vegetation succession, will be used to ensure optimal ground cover.

### *7.2.2.2 Residual impacts*

Considering the application of the abovementioned mitigation measures, the impact on biodiversity components is presented in Table 245 below and it is expected to be **Medium/Low**.

The main residual impacts could derive from presence of new buildings/infrastructures, but also for natural habitats from motorway traffic, emission of light and spreading of alien species.

In order to evaluate possible impacts, monitoring activities are suggested in the following chapter.

**Table 245: Residual impact assessment matrix for biodiversity component and Natural Habitats, during operation phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Presence of new buildings/infrastructures | Duration: | Short | Medium | Long term | **Low** | Medium | **Low** |
| | Frequency: | Single Event | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Low | | | | | |
| Changes in local hydrology | Duration: | Long | Medium | Short-mid-term | **Low** | Medium | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Highspeed motorway traffic | Duration: | Long | Medium | Short-Mid-term | **Medium** | Medium | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Long | Medium | Short-Mid-term | **Medium** | Medium | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of light | Duration: | Long | Medium | Short-mid-term | **Medium** | Medium | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Long | Medium | Mid term | **Medium** | Medium | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

### *7.2.2.3 Monitoring measures*

The following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- Accidents involving wildlife or the observation of live animal or carcasses along motorway and/or on-board recordings will be collected for at least 3 years of operation. Based on the observations additional mitigation measures to discourage wildlife crossing will be taken if needed.
- The presence of signs of erosion or stagnant water accumulation, waste or hazardous substances spill will be monitored on the motorway route in correspondence of natural habitats and river crossings and in the associated facilities rehabilitating areas at least twice a year for the next 3 years.

- The presence and spreading of invasive flora species along the motorway verge in correspondence of natural habitats and river crossings will be monitored at least twice a year for the next 3 years during the vegetative season by an expert botanist, if necessary, control campaign will be put in place in order to avoid the spreading of the invasive species.
- The rehabilitation of temporary facilitates such as quarries, borrow sites, storage area for excess excavated material and blasting areas will be monitored at least twice a year for the next 3 years during the vegetative season (March to October) in order to ensure the correct re-vegetation of the area and intervene in a timely manner in case of signs of vegetation stress or erosion.

#### *7.2.2.4 Critical Habitat*

**Flora species triggering CH**

The potential impacts on flora species triggering CH are associated with the following impact factors:

1) presence of new buildings/infrastructures;
2) introduction and spreading of alien species.

The effects of impact factors and general mitigation measures for overall biodiversity were described in the previous chapters, while the potential direct and indirect impact that could occur on flora species triggering CH are summarized in Table 246 below.

Additional studies and mitigation measures are discussed whenever necessary and residual impacts are also assessed below. Monitoring measures are presented in chapter 0.

The no net loss/net gain assessment is discussed in chapter 7.2.4 including potential offset measure Net Gain.

**Table 246: Potential direct and indirect impact during the operation phase on flora species triggering CH and additional mitigation measures**

| Species | National Red List, End./ RR | Potential Direct and Indirect Impacts | Additional Measures |
|---|---|---|---|
| *Cirsium baytopae* | EN, Regional Endemic/RR | No direct impacts due to the presence of new buildings/infrastructures and to the potential introduction/spreading of alien species are expected for the detected populations of this species during the operation phase.<br><br>Indirect impacts due to the potential introduction/spreading of alien species within 100 m from associated facilities could affect the populations found at the stations SP12 (5 individuals) and SP15 (2 individuals), located respectively at 93 m and 20 m from the expropriation corridor.<br><br>The populations found in SP08, SP09, SP10, SP11 are found outside the 100 m buffer and therefore not directly impacted. | Additional mitigation measures for populations indirectly impacted by the Project include:<br>• Prevention of IAS introduction and spreading:<br>○ Avoiding the use of non-native flora species, especially if classified as IAS will during any maintenance works;<br>○ Monitoring of the presence and the spreading of IAS, twice a year during the vegetative season by an expert botanist; If the presence of IAS is observed, control campaigns will be put in place to avoid their spreading. |

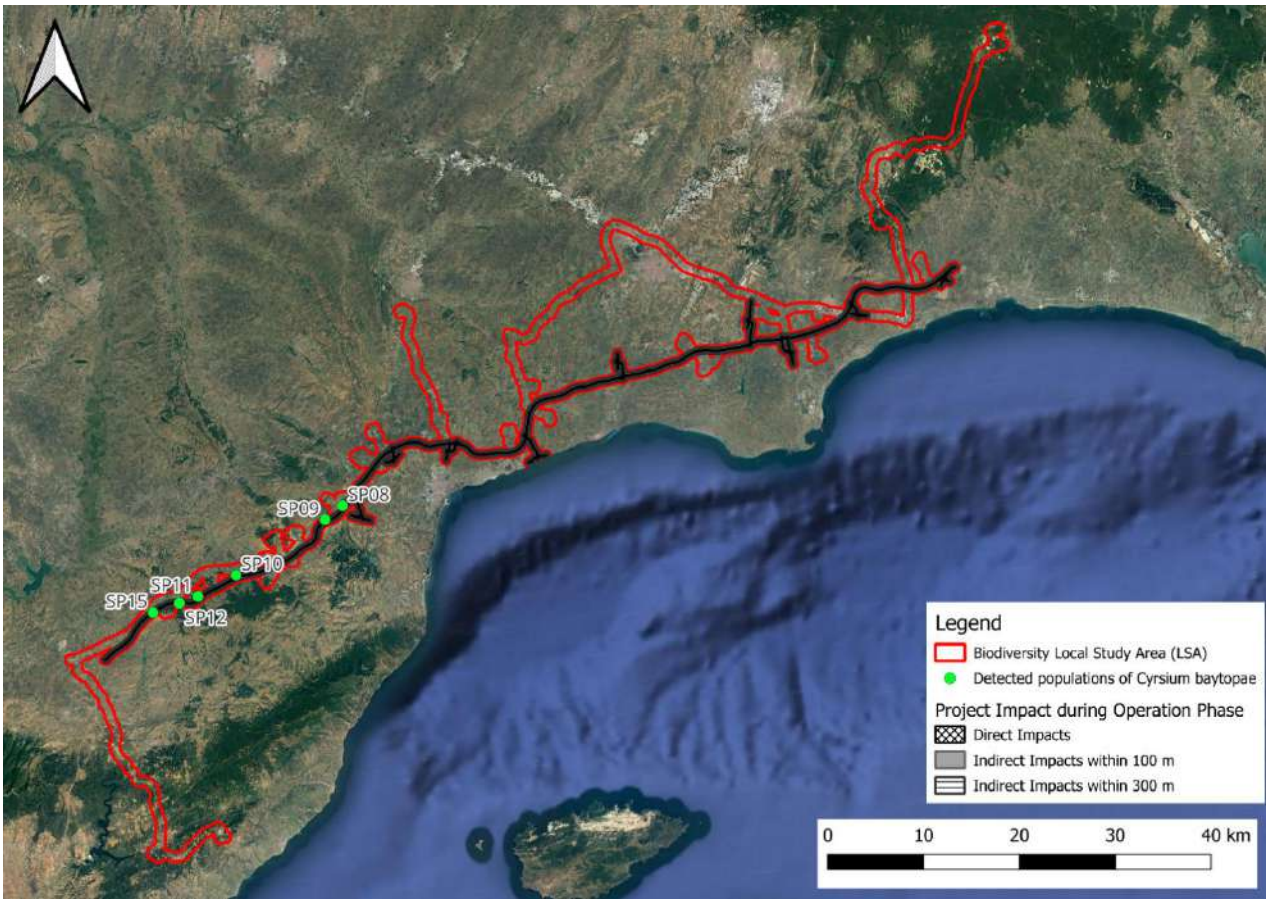



**Figure 260: Locations of the populations of Cirsium baytopae and potential direct and indirect impacts during the operation phase**

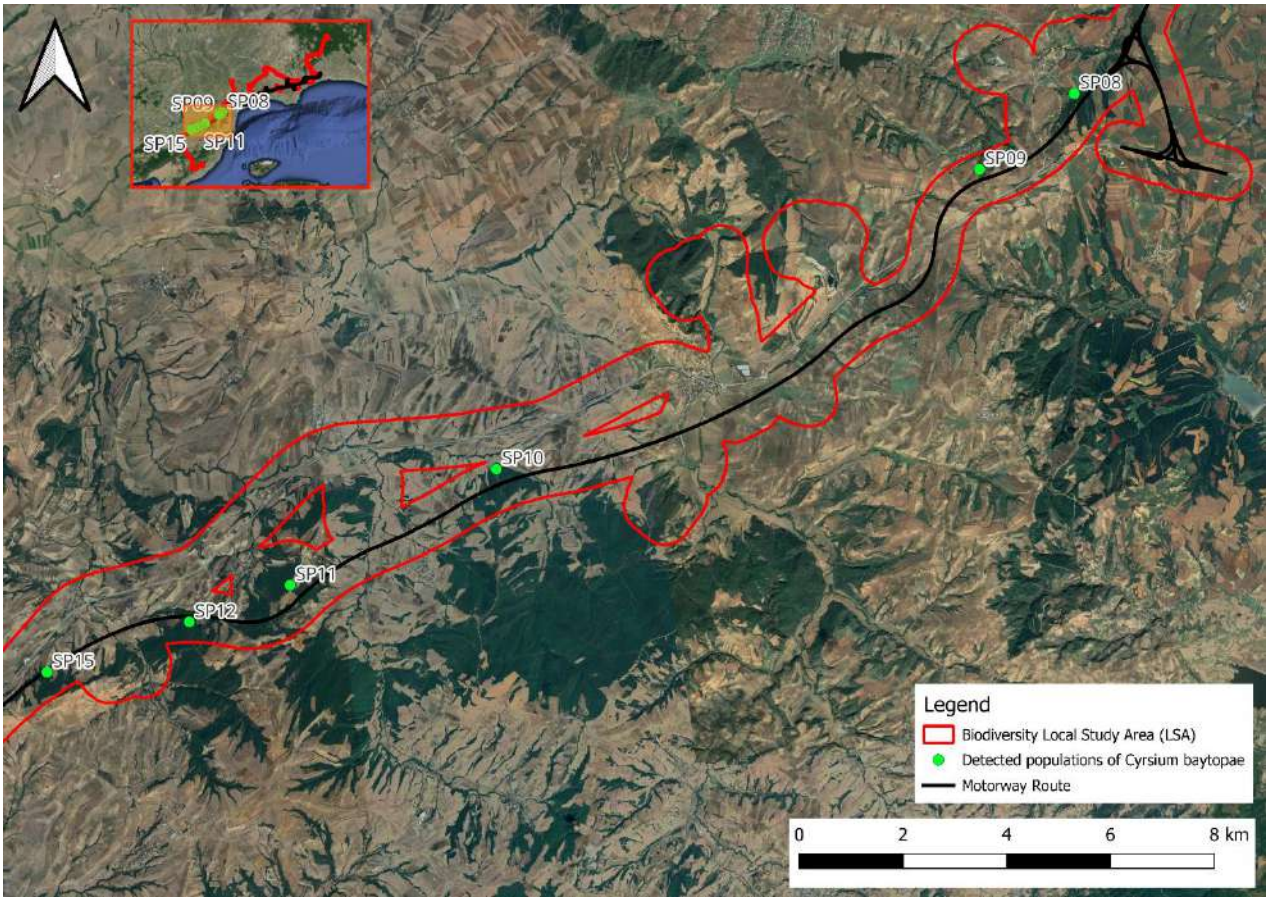



**Figure 261: Locations of the populations of Cirsium baytopae in relation to Project Footprint during the operation phase**

According to the baseline study performed, the general sensitivity is considered to be **High** for flora species triggering CHs.

Considering the application of the abovementioned mitigation measures, the impact on biodiversity components is presented in Table 247 below and it is expected to be **Low** for the flora species triggering CH in the LSA.

**Table 247: Residual impact assessment matrix for flora species triggering CH in the LSA during the operation phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Presence of new buildings/ infrastructures | Duration: | Medium | Medium | Mid term | **Medium** | Medium-high | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Introduction and spreading of alien species | Duration: | Long | High | Mid term | **Medium** | Medium-high | **Low** |
| | Frequency: | Sporadic | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Negligible | | | | | |

## Fauna species triggering CH

The main potential impacts that could affect fauna species during the operation phase are:

- presence of new buildings/infrastructures;
- motorway traffic;
- emission of lights;
- emission of noise and vibrations.

The effects of impact factors and general mitigation measures for overall biodiversity were described in the previous chapters, while the potential direct and indirect impact that could occur on mammal species triggering CH are summarized in Table 248 below.

Additional studies and mitigation measures are discussed whenever necessary and residual impacts are also assessed below. Monitoring measures are presented in chapter 0.

The no net loss/net gain assessment is discussed in chapter 7.2.4 including potential offset measure Net Gain.

**Table 248: Potential direct and indirect impact during the operation phase on fauna species triggering CH, and additional mitigation measures**

| Taxon | Scientific Name | Common Name | Global IUCN | End. / RR | Obs./ Lit. | Potential Direct and Indirect Impacts | Additional Measures |
|---|---|---|---|---|---|---|---|
| Mammals | *Spermophilus citellus* | European Souslik | EN | - | L | The presence of the species within the LSA has not been confirmed by June 2022 surveys.<br>Direct and indirect impacts within 100 m and 300 m buffer could affect this species habitat if not properly mitigated. | Additional mitigation measures for populations directly and/or indirectly impacted by the Project:<br>Roadkill minimization:<br>• speed limits and fencing of specific motorway sections will be put in place wherever possible, in areas of particular interest for target species;<br>• roadkills and animal sighting along the motorway will be reported by maintenance workers.<br>Salvaging and Translocation<br>Planned mitigation measures for biodiversity during the operation phase are considered sufficient to mitigate indirect impact.<br>Implementation of "wildlife friendly" lighting solutions to reduce potential bird attraction (minimization)<br>Planned mitigation measures for biodiversity during the operation phase are considered sufficient to mitigate indirect impact.<br>If necessary, Biodiversity Action Plan will include appropriate offset measures to ensure Net Gain depending on the residual impacts identified during the additional studies and monitoring. |
| Birds | *Aythya ferina* | Common Pochard | VU | - | L | The presence of the species within the LSA has not been confirmed by June 2022 surveys. However, it is reported as breeding in the Terkos Basin IBA located at 5 km east of the Project (20 estimated breeding pairs).<br>Direct and indirect impacts within 100 m and 300 m buffer could affected this species habitat if not properly mitigated. | |
| | *Branta ruficollis* | Red-breasted Goose | VU | - | L | The presence of the species within the LSA has not been confirmed by June 2022 surveys. However, the species is reported as wintering in the Terkos Basin IBA located at 5 km east of the Project (90 estimated individuals).<br>Direct and indirect impacts within 100 m and 300 m buffer could affected this species habitat if not properly mitigated. | |

According to the baseline study performed, the general sensitivity is considered to be **High** for terrestrial fauna species triggering CHs.

Considering the application of the abovementioned mitigation measures, the impact on biodiversity components is presented in Table 249 below and it is expected to be **Medium** for the terrestrial fauna species triggering CH identified within the LSA.

**Table 249: Residual impact assessment matrix for fauna species triggering CH in the LSA during operation phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features - Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Presence of new buildings/infrastructures | Duration: | Long | Medium | Long term | **Medium** | Medium | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Project footprint | | | | | |
| | Intensity: | Medium | | | | | |
| Motorway traffic | Duration: | Long | High | Short-Mid term | **Medium** | Medium | **Medium** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of noise and vibration | Duration: | Long | High | Short-term | **Low** | Medium-high | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Emission of light | Duration: | Long | High | Short-term | **Low** | Medium-high | **Negligible** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

## Monitoring Measures

The following additional monitoring measures are considered appropriate for species triggering CH during operation:

- **Terrestrial Flora Species triggering CH**
  - Flora Salvaging and Direct Translocation

    Translocation sites identified for flora species shall be monitored periodically for any sign of stress or disturbance. During the first two years after translocation monitoring shall occur monthly during the vegetative season. After the first two years monitoring shall occur every three months during the vegetative season (unless particular issues are recorded during previous monitoring).

  - Flora On-site Conservation

On-site Conservation Areas identified for flora species shall be monitored periodically and any signs of disturbance will be noted (e.g. trampling, dust deposition, soil erosion, presence of stagnant water). Monitoring will be carried out twice during the vegetative season (from April to September) for the first 3 years of operation (unless particular issues are recorded during previous monitoring).

- Seed collection

  The number of seeds collected and their viability shall be tested in order to assess the need of additional collection campaigns.

- **Fauna species triggering CH**

  - Salvaging and Translocation:

    Translocation sites identified for *Spermophilus citellus* shall be monitored periodically for any sign of stress or disturbance. During the first two years after translocation monitoring shall occur monthly during the species activity season. After the first two years monitoring shall occur once a year during the activity season of the species (unless particular issues are recorded during previous monitoring). It would be important to check the status of the suitable habitat for the species at each site identified for the translocation.

### 7.2.3 Decommissioning/Closure Phase

The potential impacts on biodiversity are associated with the following impact factors:

1) increase in vehicular traffic;
2) emission of noise and vibration;
3) introduction and spreading of alien species;
4) re-establishment of natural morphology and hydrology (positive impact);
5) re-establishment of natural vegetation (positive impact).

The general focus of the decommissioning and closure phase is to rehabilitate the disturbed lands to create stable, non-polluting and self-sustaining ecosystem capable of being incorporated into the future landscapes, which will be consistent with activities in the general surrounding area.

However, considering that Decommissioning and Closure will not happen for many years (the project life span is expected to last minimum 30 years), the future land use of the area is not known and no detailed information is available at this stage. Therefore, it is not possible to discuss in the details the effects of this Phase on the biodiversity component.

In general, it is expected that during decommissioning, indirect negative impacts deriving from increase in vehicular traffic, emission of noise and vibration and introduction and spreading of alien species will be similar to those of construction activities. However, positive impacts deriving from the re-establishment of natural morphology and hydrology and the restoration of the disturbed areas will allow to reclaim most of the areas with an expected overall positive effect on biodiversity.

### 7.2.4 No Net Loss/Net Gain Assessment

#### *Natural Habitat*

For natural habitats direct impacts are mainly associated with habitat loss in correspondence of the Project footprint and its permanent facilities (camp sites, storage areas, borrow pits, limestone quarries, concrete plants, sub-construction sites). Considering that no detailed information is available at this stage on the decommissioning and closure plan, using a precautionary approach, the net loss is calculated conservatively at the end of the operation phase corresponding to the areas permanently occupied by the presence of permanent buildings/infrastructures connected to the Project.

At the end of the construction phase restoration/rehabilitation activities will be conducted on all temporary facilities, therefore the only direct impacts remaining will be those due to presence of permanent buildings/infrastructures. Temporary facilitates such as camp sites, storage areas, borrow pits, limestone quarries, concrete plants, sub-construction sites are planned to be reclaimed and restored after the construction phase, therefore they are not considered as loss. However, the rehabilitation of these areas must be carefully monitored to make sure the target is met.

Indirect impacts from the project could occur in a 100 and 300 m buffer and that could cause changes in the habitat suitability. However, mitigation and monitoring measures presented in the above for the construction and operation phases within the LSA are considered sufficient for indirect impacts on natural habitats indirectly impacted.

Net loss of natural habitat is expected to affect **32.59 ha** of natural habitat. Most of the loss will affect woodlands and pastures, in particular “G1.7 - Thermophilous deciduous woodland”, “G5.2 - Small broadleaved deciduous anthropogenic woodlands”, and “E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows” (28.44 ha in total).

**Table 250: Net loss of Natural Habitats calculated within the LSA**

| Habitat | Total LSA | Net Loss |
|---|---|---|
| | ha | ha |
| C2.3 - Permanent non-tidal, smooth-flowing watercourses | 68.07 | 0.34 |
| C2.5 - Temporary running waters | 111.49 | 1.33 |
| E2.1 - Permanent mesotrophic pastures and aftermath-grazed meadows | 1,251.79 | 4.12 |
| E3.2 - Mediterranean short humid grassland | 85.25 | - |
| G1.7 - Thermophilous deciduous woodland | 3,007.42 | 15.46 |
| G4 - Mixed deciduous and coniferous woodland | 295.11 | - |
| G5.2 - Small broadleaved deciduous anthropogenic woodlands | 589.70 | 8.86 |
| G5.7 - Coppice and early-stage plantations | 290.33 | 2.48 |
| ***Total*** | ***5,699.16*** | ***32.59*** |

No net loss and preferably net gain for natural habitats will be achieved through offset actions that will create a measurable conservation gain. Offsets will be commensurate to the magnitude of the impacts and will adhere to the “Like-for-like or better” principle. Biodiversity offsets must be designed to conserve the same biodiversity values that are being impacted by the Project (i.e., an “in-kind” offset). Although a like-for-like approach is

preferred, “out-of-kind” offset that involve “trading up” to benefit Natural Habitats that are of greater conservation value will also be considered (IFC PS6).

A Biodiversity Action Plan will include appropriate offset measure to ensure No Net Loss, or preferably Net Gain, depending on the residual impacts identified during the additional studies and monitoring. Offset measures that will be detailed in the Plan could include:

- protection of existing Natural Habitat, specifically grassland habitat and deciduous woodland, that could be otherwise threatened by impacts other than the Project: create protected areas or private natural reserves in areas where Natural Habitats might otherwise be at risk. This should be accomplished for instance working with regulators to achieve higher levels of protection of areas with currently no formal protection (e.g. Key Biodiversity Areas);
- arrest ongoing degradation of Natural Habitat, specifically grassland habitat and deciduous woodland, caused by sources other than the Project:
    - discuss voluntary agreements with land users to protect or enhance Natural Habitat by regulating the use of the land for grazing in order to protect its biodiversity value;
    - help strengthen policy and management capacity within protected areas for which a conservation objective is not being met under current condition;
- restoration of Natural Habitats and in particular of suitable grassland areas using mix of species to maximize biodiversity and grazing exclusion to allow for the natural recovery.

## *Critical Habitat triggered by flora species*

The flora species identified as potentially triggering CH and potentially impacted by the Project (e.g. within the Project area of influence) is:

- *Cirsium baytopae* (EN, endemic/RR).

The net loss is conservatively calculated as the area affected by direct impacts at the end of the construction phase or in the worst-case scenario based on current knowledge of the species distribution.

Since little is known about the ecological requirements of this flora species, using a precautionary approach, it is considered that it will not be possible to restore the specific ecological conditions of the species triggering CHs directly impacted by the Project. Moreover, considering that the translocation of natural species in the wild is not always successful and no information are available at the moment on the survival rate of these particular species, the potential positive effects of these actions are not considered at present.

**Table 251: Net Loss of flora species determining CH**

| Species | National Red List, End. /RR | Net Loss |
|---|---|---|
| *Cirsium baytopae* | EN, Regional endemic/ RR | Net loss due to the Project is expected to affect a total extent of 26.80 ha of critical habitats, which comprises 15.46 ha of G1.7 EUNIS habitat “Thermophilous deciduous woodland”, 8.86 ha of G5.2 EUNIS habitat “Small broadleaved deciduous anthropogenic woodlands”, and 2.48 ha of G5.7 EUNIS habitat “Coppice and early-stage plantations”. |

| Species | National Red List, End. /RR | Net Loss |
|---|---|---|
| | | The feasibility and long-term success of “Flora Salvaging and Translocation” measures need to be monitored to assess if the measure suggested within the ESIA is sufficient to ensure No Net Loss/Net Gain of flora species directly impacted by the Project. |

Based on these precautionary estimates, offset will likely be needed in order to ensure net gain *Cirsium baytopae* critical habitats in case the results of the monitoring will show that “Flora Salvaging and Translocation” measures are not sufficient.

If needed, a Biodiversity Action Plan will include appropriate offset measures to ensure Net Gain depending on the residual impacts identified during the additional studies and monitoring. Offset measures that will be detailed in the Plan will possibly include:

- on-site conservation: protection of existing populations that could be otherwise threatened by impacts other than the Project (e.g. overgrazing, developments);
- seed collection from known populations: to ensure propagules for cultivation and multiplication in a controlled environment but also to be donated to Seed Banks for conservation;
- cultivation in a controlled environment: to ensure a sufficient and sustainable source of plants for translocation;
- creation of new viable populations or enhancement of existing populations.

These activities will be performed in collaboration with local research centres and institutions (e.g. Ankara Seed Bank, University) to identify the multiplication and translocation protocols and ensure ongoing protection and monitoring of the populations.

### *Critical Habitat triggered by fauna species*

A mammal species has been identified as triggering CH in the LSA and potentially impacted by the Project (e.g. within the Project area of influence):

- *Spermophilus citellus* (EN)

Two bird species have been identified as triggering CH in the LSA and potentially impacted by the Project (e.g. within the Project area of influence):

- *Aythya farina*
- *Branta ruficollis*

Net loss for these species could be associated with loss of suitable habitats, mainly due to vegetation and topsoil removal, as well as possible significant changes in local morphology during construction works. In fact, squirrels usually burrow in light, well drained soils in grasslands ranging from short-grass steppes to meadow orchards, so that the removal of vegetation and soil will have an impact on both squirrel burrows and availability of food

resources (e.g. seeds, roots, flowers, arthropods). On the other hand, during operation, impacts could also be related to the disturbance caused by motorway traffic, as well as noise and vibration emissions, if appropriate mitigation measures are not designed and implemented.

However, strong mitigation measures are in place within the ESIA to avoid any permanent loss. Ecological rehabilitation of areas interested by temporary facilities will be planned and implemented in such a way as to ensure the presence of suitable habitats for the species.

The species are considered as potentially present within the LSA based on literature since its presence was not confirmed during the first field survey carried out in June 2022. Suitable habitats for the target mammal species *Spermophilus citellus* are present within the LSA (meadows and grasslands).

The two target bird species have been reported in the Terkos Basin IBA which is located at 5 km east of the Project.

**Table 252: Net Loss of fauna species determining CH**

| Taxon | Species | National Red List, End. / RR | Net Loss |
|---|---|---|---|
| Mammals | *Spermophilus citellus* | EN | Net loss due to the Project is expected to affect a total extent of 4.13 ha of potential critical habitats, corresponding to E2.1 EUNIS habitat “Permanent mesotrophic pastures and aftermath-grazed meadows”<br>Mitigation measures previously discussed for the construction and operation phases are considered sufficient to avoid any long-term loss. Monitoring on potential critical habitats (grasslands for *S. citellus*) during both construction and operation phase will be crucial to ensure these measures are properly applied, and ensure that corrective actions, if needed, are in place in a timely manner. |
| Birds | *Aythya ferina* | VU | Net loss due to the Project is expected to affect a total extent of 0.34 ha of potential critical habitats, corresponding to C2.3 EUNIS habitat “Permanent non-tidal, smooth-flowing watercourses”<br>Mitigation measures previously discussed for the construction and operation phases are considered sufficient to avoid any long-term loss. Monitoring on potential critical habitats (lowland marshes, slow-flowing watercourses, fishponds) during both construction and operation phase will be crucial to ensure these measures are properly applied, and ensure that corrective actions, if needed, are in place in a timely manner. |
| | *Branta ruficollis* | VU | Net loss due to the Project is expected to affect a total extent of 0.34 ha of potential critical habitats, corresponding to C2.3 EUNIS habitat “Permanent non-tidal, smooth-flowing watercourses”<br>Mitigation measures previously discussed for the construction and operation phases are considered sufficient to avoid any long-term loss. Monitoring on potential critical habitats (lowland marshes, |

| Taxon | Species | National Red List, End. / RR | Net Loss |
|---|---|---|---|
| | | | slow-flowing watercourses, fishponds) during both construction and operation phase will be crucial to ensure these measures are properly applied, and ensure that corrective actions, if needed, are in place in a timely manner. |

Properly implemented, rehabilitation/restoration of suitable areas for the target species could actually be an improvement compared to the present situation in many locations. However, the rehabilitation of these areas must be carefully monitored to make sure the target is met.

If needed, a Biodiversity Action Plan will include appropriate offset measure to ensure Net Gain depending on the residual impacts identified during the additional studies and monitoring. Offset measures that will be detailed in the Plan could include:

- Protection or restoration of suitable habitats for the CH triggering mammal and bird species (e.g. grasslands, marshes habitats) by rehabilitation of natural habitats affected by impacts other than the Project (erosion, past development and infrastructures, etc.) by:
  - Sustainable grazing management of grassland and steppe habitats to promote flora species diversity, cover and minimize soil erosion;
  - Restoration/creation of riparian vegetation to provide a buffer around existing wetlands to protect them from disturbance and runoff of pesticide and other pollutants.

# 7.3 Social Component

## 7.3.1 Socioeconomic Impact

This section of the report assesses the potential positive and negative impacts of the Project on the AoI for construction, operation and decommissioning and closure phases. Based on the anticipations from the local communities collected through household surveys, the expert opinions, and the review of the equivalent projects as well as the social baseline conditions, the potential socioeconomic impacts are divided into nine main categories as follows:

- Population and Demography
- Economy and Employment
- Resettlement and Land Acquisition
- Community Health and Safety
- Labour and Working Conditions
- Infrastructure, Utilities and Services
- Gender Assessment
- Vulnerable Groups Assessment
- Human Rights Impact Assessment

In addition to the Impact Assessment based on ESIA Methodology; to have a more comprehensive understanding of the potential impacts, the local communities were asked about their anticipations about the impacts of the Project on the above categories during the social field study. A critical limitation during the interviews with the local people is that for some impact factors, it was not possible to differentiate the impacts of the construction, operation, and decommissioning phases separately.

The following subsections will elaborate on the impacts of the Project on the AoI based on these categories. Also, mitigation measures and monitoring where relevant will be provided to reduce the potential negative impacts caused by the Project.

### *7.3.1.1 Population and Demography*

Within the scope of the Project, establishing worker camps in a close vicinity to the settlements may lead to population influx in the construction phase whereas people coming to the AoI after the Project completion may also lead to population influx during the operation phase. The population influx may result changes in the population structure, pressure on infrastructure, social and cultural adaptation problems, and increase in crime rates, which are potential negative impacts. However, positive impacts such as increased economic mobility and an increase in the workforce may also be experienced in relation to the population influx. The potential impacts of the Project on the population and demography of the AoI are assessed in detail for the construction and operation phases in this section.

#### 7.3.1.1.1 Impact Analysis

In the social field study, household surveys were conducted with the local residents of the settlements, it was observed that the local people also have concerns on the individual level about the potential population influx that would be resulted from the Project. Table 253 below represents the anticipations of the residents on population change.

**Table 253: Impact Anticipations of the Residents on Population Change**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 56 | 67.5 |
| | | No | 27 | 32.5 |
| | | Total | 83 | 100 |
| Tekirdağ | Çorlu | Yes | 24 | 80 |
| | | No | 6 | 20 |
| | | Total | 30 | 100 |
| | Marmaraereğlisi | Yes | 5 | 45.5 |
| | | No | 6 | 54.5 |
| | | Total | 11 | 100 |
| | Süleymanpaşa | Yes | 32 | 62.7 |
| | | No | 19 | 37.3 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 6 | 50 |
| | | No | 6 | 50 |
| | | Total | 12 | 100 |

Population change was the most precise and expected possible impact for the residents of the area. It has been demonstrated that in all districts, the number of persons who believe there will be an impact outnumber those who believe there will be no impact. The locals anticipate a population influx during the construction and operation phases, especially in the Çorlu, Silivri, Süleymanpaşa and Malkara districts. While some locals believe that the increased population would have a detrimental influence on the settlements in terms of traffic and conflicts, others believe that it will have a favourable impact on the local economy through opportunities for employment, procurement, and tourism.

Another potential impact on the population is the cultural conflict between the local people and the Project workers. During the social field study, the local people were asked whether they had concerns about the potential cultural conflict between the locals and the Project workers. Their anticipations of the impacts of the Project on cultural conflict are provided in Table 254.

**Table 254: Impact Anticipations on the Residents on Cultural Conflict with the Project Workers**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 17 | 20.5 |
| | | No | 66 | 79.5 |
| | | No opinion | 0 | 0 |
| | | Total | 83 | 100 |
| Tekirdağ | Çorlu | Yes | 10 | 33.3 |
| | | No | 18 | 60 |
| | | No opinion | 2 | 6.7 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | Total | 30 | 100 |
| | Marmaraereğlisi | Yes | 4 | 36.4 |
| | | No | 6 | 54.5 |
| | | No opinion | 1 | 9.1 |
| | | Total | 11 | 100 |
| | Süleymanpaşa | Yes | 14 | 27.5 |
| | | No | 37 | 72.5 |
| | | No opinion | 0 | 0 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 3 | 25 |
| | | No | 9 | 75 |
| | | No opinion | 0 | 0 |
| | | Total | 12 | 100 |

The majority of those who took part in the household surveys did not expect conflicts between the locals and the Project workers, considering the workers would be staying in workers' camps. In Çorlu and Marmaraereğlisi, especially where more residents anticipate a population influx during the construction and operation phases of the Project, more participants think there would be conflicts between the local people and the Project workers compared to the other districts.

#### *7.3.1.1.1.1 Construction Phase*

During the construction phase of the Project, maximum 3,300 workers will be employed. The total number of workers which will be stay in the camp is not certain yet. The pre-construction (early works 8 months), construction (34 months) and test and commissioning (3 months) phases of the Project will last for 45 months.

It is proposed that the personnel employed during the construction phase be recruited from the settlements near the Project Site to control the population influx and contribute to the local economy. The locally employed population will continue to reside in their current residential areas, which will not create additional pressure on the existing local structure. However, if the specific skilled positions cannot be recruited from the local population, non-local personnel may be recruited and accommodated in prefabricated workers' accommodations during the construction phase especially for the semiskilled and the skilled positions.

In the context of the Project's construction activities, there will be 1 campsite, 2 sub-construction sites which may lead the population increase of the local communities and create social unrest. The total number of workers which will be stay in the camp is not certain at this stage of the Project. There will be no accommodation in sub-construction sites. These sites will be used by the workers for lunch and there will be offices for HSE department. The information on the planned campsites is presented in Table 255.

**Table 255: Detailed Information of Camp Sites, Storage Areas, Sub-construction Site**

| Facility Name | Province | District | Neighbourhood | Km |
|---|---|---|---|---|
| **Camp Site** | | | | |
| Camp Site-1 | Tekirdağ | Süleymanpaşa | Gazioğlu | 48+500 |
| **Sub-construction site** | | | | |
| Sub-construction Site-1 | İstanbul | Silivri | Fevzipaşa | 16+000 |
| Sub-construction Site-2 | Tekirdağ | Süleymanpaşa | İnecik | 83+500 |

Population influx may emerge when workers outside the settlements migrate to the smaller communities in the AoI due to the employment opportunities during the construction phase of the Project. Such population influx has the potential to impact the local settlements in various ways, such as:

- If the construction workers are not familiar with the local culture, they may find it harder to fit into the local communities, which could cause potential local conflict,
- If workers' accommodation sites are located close to local residential households (if it is less than 100m), it could further contribute to strained relationships between workers and local residents unless the construction compound selection criteria in the ESMP will reduce this risk.
- The long-term duration of construction activities (approximately three years as currently planned) could exacerbate the related impacts of population influx.

However, hiring local people for the construction phase will significantly reduce these potential impacts, as the influx of workers from outside the area will be minimized. Hiring individuals from the local communities can ease the burden on local infrastructure and services, reducing traffic related impacts and minimizing changes in social dynamics within the local areas.

#### *7.3.1.1.1.2 Operation Phase*

The transportation mobility of the passengers and freights is expected to lead to the development of new economic sectors and long-term employment, especially in the planned motorway service facilities, creating a long-term population increase in the AoI. Three motorway service facilities will be constructed for the Project. The kilometre details of the service facilities are presented in Table 256**.**

**Table 256: Motorway Service Facilities**

| Name | Kilometer |
|---|---|
| MSF1 | 16+000 |
| MSF2 | 45+500 |
| MSF3 | 83+750 |

#### *7.3.1.1.1.3 Decommissioning and Closure Phase*

No impact on population and demography is anticipated during the decommissioning and closure phase.

### 7.3.1.1.2 Mitigation Measures

It is possible to reduce the potential negative impacts emerged from the Project on the population and locals of the AoI if certain mitigation measures are taken, such as:

- Priority will be given to local people during recruitment process where applicable.
- Employment Policy Statement and Local Content Procedure of the Malkara-Çanakkale Motorway Project (developed by ÇOK A.Ş.) will be reviewed and revised according to the Project Standards, updated and implemented for the Project.
- Influx Management Procedure will be developed according to the Project Standards, updated and implemented for the Project.
- Project Specific Camp Site Management Plan (including Workers' Accommodation) in line with the IFC/EBRD's Guidance Note on Worker's Accommodation, 2009 will be developed and requirements listed in this plan will be periodically monitored.
- Workers' accommodations will be designed in compliance with the processes and standards of the IFC/EBRD's Guidance Note on Worker's Accommodation, 2009, and the basic needs of the workers will be provided within the borders of the accommodation to limit the interaction of the workers with the local communities to prevent the pressure on the local utilities and the services.
- Measures will be implemented to mitigate environmental impacts associated with increased population, such as waste management programs, and pollution control measures, to preserve the natural ecosystem and quality of life for residents.
- An Employee Code of Conduct will be developed and enforced to ensure proper behaviour and respect for local customs.
- Cultural awareness, code of conduct and ethic training will be provided to workers to prevent any cultural conflicts.
- The mukhtars of the neighbourhoods will be informed about the construction of the workers' accommodation, and the workers that will be accommodated in the camps will be registered in the neighbourhood system.
- A community grievance mechanism ("GRM") will be established to record all complaints, including the anonymous complaints and necessary measures will be taken accordingly.
- A Human Rights Policy or a Human Rights Management Plan will be developed and implemented for the Project.

By implementing these mitigation measures in a comprehensive and coordinated manner, the negative impacts of population influx will be effectively addressed.

#### 7.3.1.1.3 Residual Impacts

##### *7.3.1.1.3.1 Construction Phase*

The construction period of the Project will be completed in 34 months and considering the usage of a single camp site during the construction phase of the Project, the duration of the impact will be long term and the frequency of the impact will be frequent. The workers that will be accommodated in the camp area will require transportation to the construction sites so even the geographical extent of the population influx impact will be limited to the closest residential areas, considering the transportation of the workers, it is assessed as regional. The intensity of the impact is assessed as high considering the number of workers. Considering the low population of the communities close to the camp site, the sensitivity of the component assessed as very high. The reversibility of the impact is short-mid-term since, after the construction phase, camp will be removed from the AoI.

The mitigation measures for the potential population influx have been determined in order to prevent and reduce its negative impacts during the construction phase. These measures will be implemented and monitored regularly. The proper implementation of such measures will reduce the high impact to low. The impact evaluation of the Project on the population in the construction phase is provided in Table 257.

**Table 257: Residual Impact Assessment Matrix for Population and Demography During Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Population increases during construction | Duration: | Long | Very high | Short-mid-term | **High** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | High | | | | | |

#### *7.3.1.1.3.2 Operation Phase*

The operation phase of the Project will increase the population mobility and after the completion of the Project several provinces will be connected. The operation phase of the Project is expected to be 100 years and the duration of the impact will be very long term and frequency will be continuous. Since the Project aims improved connectivity along with the Gebze-İzmir and Northern Marmara routes the geographic extent of the Project will be national. The intensity of the impact will be very high where the interchanges will be constructed. The component sensitivity of the impact will be limited with the interchange locations and the component sensitivity will be medium-low. Reversibility of the impact will be long-term.

The impact value before the implementation of the mitigation measures is assessed as high and after the implementation of the mitigation measures the residual impact of the Project during the operation phase will reduce to negligible. The impact assessment of the Project on the population in the operation phase is provided in Table 258.

**Table 258: Residual Impact Assessment Matrix for Population and Demography During Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Population increases during operation (around the motorway service facilities and connected settlements) | Duration: | Very long | Medium-low | Long term | **High** | High | **Negligible** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | National | | | | | |
| | Intensity: | Very high | | | | | |

#### *7.3.1.1.3.3 Decommissioning and Closure Phase*

Impacts on the local population for the decommissioning phase are difficult to predict at this stage of the Project, as closure is anticipated to occur 100 years from now, and the road is expected to remain in use for the entire duration without any planned closure.

### 7.3.1.1.4 Monitoring

Monitoring activities will be performed on the following issues during the construction and/or operation to ensure the implementation and effectiveness of the proposed mitigation measures:

- Periodic assessments will be conducted to evaluate the condition and adequacy of Project infrastructure, ensuring that they meet the needs of the growing population.

- The effectiveness of cultural sensitivity training programs will be evaluated through feedback surveys.
- The operation of grievance mechanisms will be reviewed regularly to assess their accessibility, transparency, and responsiveness in addressing community concerns and complaints related to the Project impacts.
- Stakeholder Engagement and consultation registers and records by the Stakeholder Engagement Plan will be produced for the Project and monitored.
- Percentages of the local employees (which will be a performance indicator for ESMS to be implemented for the Project), (target will me 50% at minimum) will be monitored.

KPIs listed in the Local Content Procedure will be tracked. In line with the Local Content Procedure, EPC Contactor will periodically report to ÇOK A.Ş. by quarterly reports which will summarize all issues about construction's environmental, health and safety and social performance. These reports will also contain issues related to local procurement performance.

#### *7.3.1.2 Economy and Employment*

##### *Local Employment*

In this section, the potential impacts of the Project on the local economy and employment are assessed. In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on economy and employment. Details of the expectation on the local employment is presented in Table 259.

**Table 259: Impact Anticipations of the Residents on Local Employment**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 43 | 51.2 |
| | | No | 40 | 47.6 |
| | | No opinion | 1 | 1.2 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 10 | 43.5 |
| | | No | 13 | 56.5 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 4 | 23.5 |
| | | No | 12 | 70.6 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 23 | 45.1 |
| | | No | 28 | 54.9 |
| | | No opinion | 0 | 0 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 4 | 33.3 |
| | | No | 8 | 66.7 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | Total | 12 | 100 |

Most district residents think that the project will not have an impact on local employment. However, slightly more than half of those in Silivri (51.2%) think that local employment will be affected. Since the employment opportunities potentially provided by the Project concern primarily the younger population, the age distribution in the district is critical when considering the Project's impact on local employment.

### *Local Procurement (Economy)*

The local procurement expectations of the participants differ in accordance with the characteristics of the rural and urban life of the settlements. Details of the expectations on local procurement is given in Table 260.

**Table 260: Impact Anticipations of Residents on Local Procurement**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 35 | 41.7 |
| | | No | 48 | 57.1 |
| | | No opinion | 1 | 1.2 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 10 | 43.5 |
| | | No | 13 | 56.5 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 5 | 29.4 |
| | | No | 11 | 64.7 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 18 | 35.3 |
| | | No | 33 | 64.7 |
| | | No opinion | 0 | 0 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 6 | 50 |
| | | No | 6 | 50 |
| | | Total | 12 | 100 |

All districts except Malkara agree that local procurement will not be affected by the project. In Malkara, half of the people think it will be affected and half think it will not be affected.

#### 7.3.1.2.1 Impact Analysis

##### *7.3.1.2.1.1 Construction Phase*

The Project is expected to generate positive impacts due to the demand for workforce and the demand for goods, materials, and services. Most settlements have residents who work as security guards, construction workers, drivers, operators, technicians, and engineers. The Project will hire staff locally and nationally

according to the skills required and the availability of the workforce in the region. The required labour force during the construction phase of the Project will be 3,300 at the peak period.

In addition to the direct and indirect employment opportunities, the Project is expected to create economic contributions to the local economy by purchasing goods and services such as fuel needs of mobile equipment, transportation, foods, passenger automobiles to be used in the Project, electrical energy needs of the Project, maintenance and repair materials, office supplies, vehicle, travel, logistics, food, accommodation, communication, security.

#### *7.3.1.2.1.2 Operation Phase*

The Project is expected to attract more investors in the Project region due to better accessibility by expanding geographical markets and resources to other areas and countries. The increased transportation infrastructure will bring more employment opportunities to the local people, including diversification of economic activities.

As for the employment opportunities, the Project will not be able to provide the same number of recruitments during the operation period and the number of people to be recruited will be much lower than during the construction phase and the number of the workers during the operation phase of the Project is estimated to vary between 300 to 400.

In addition, after the completion of the Project, major provinces of the Eagan Region and Marmara Region will be connected, and the Project will be one of the main economic contributors in terms of the transportation of the goods and materials during the operation phase of the Project.

#### *7.3.1.2.1.3 Decommissioning and Closure Phase*

No specific impact is expected during the decommissioning and closure phase.

### 7.3.1.2.2 Enhancement Measures

Job opportunities provided by the Project might be an essential source of income, especially for unemployed people, households living in poverty and the younger population in the AoI. The following enhancement actions will be implemented to improve the opportunities emerging from the Project and to enhance the positive impacts of the Project:

- The Project will implement human resource policies and procedures in compliance with the IFC PS-2 on Labour and Working Conditions. Such policies are expected to provide more predictable employment opportunities for direct and indirect employees.
- Employment Policy Statement and Local Content Procedure of the Malkara-Çanakkale Motorway Project (developed by ÇOK A.Ş.) will be reviewed and revised according to the Project Standards, updated and implemented for the Project.
- The Project will develop tools and plans that guarantee employee rights, comply with IFC PSs and ILO conventions, and provide a human rights-respectful work environment. Employment Policy Statement of the Malkara-Çanakkale Motorway Project will be implemented.
- Individuals whose livelihood sources are affected by the Project impacts will be given priority in the recruitment process of the Project.
- Formal and transparent recruitment process will be implemented to provide equal opportunity to the applicants.
- The mukhtars of the neighbourhoods will be informed about the recruitment opportunities of the Project (announcements, banners) to reduce the requirement of the non-local labour force.

- Where applicable, vocational training will be provided to local people to maximize the local labour force.
- Before the procurement, local suppliers will be identified, and priority on purchases will be given to goods and services from local businesses.
- Capacity development will be applied, including the OHS and HR.
- Equal procurement opportunities will be provided to local small businesses in line with the Local Content Procedure.
- All subcontractors will be monitored to prevent child and forced labour.
- An equal tender process will be applied.

#### 7.3.1.2.3 Residual Impacts

##### *7.3.1.2.3.1 Construction Phase*

The duration of the demand for workforce and demand for goods, materials & services will be long term throughout the construction phase and the frequency of both impact factors assessed as recurrent. The labour and material requirement of the Project is expected to be sourced at the regional level (geographic extent) and the intensity of the impact factors will be high and medium, respectively. Considering the expectations of the local communities the component sensitivity of the impact is assessed as medium. The reversibility of the impact is short-mid-term.

The expected job opportunities emerging from the Project is positive and impact value expected for demand for workforce is medium. Based on the baseline conditions of the assessed component, the Project characteristics and actions, as well as the proper implementation of the enhancement measures proposed above, a medium-level impact is expected on demand for goods, materials and services. The impact assessment of the Project on the local economy and employment in the construction phase is provided in Table 261.

**Table 261: Residual Impact Assessment Matrix for Economy and Employment During Construction Phase (Positive)**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features | | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|---|
| Demand for workforce | Duration: | Long | Medium | Reversibility: | Short-mid-term | **Medium** | Medium high | **Medium** |
| | Frequency: | Recurrent | | | | | | |
| | Geo. Extent: | Regional | | | | | | |
| | Intensity: | High | | | | | | |
| Demand for goods, materials and services | Duration: | Long | Medium | Reversibility: | Short-mid-term | **Medium** | Medium | **Medium** |
| | Frequency: | Recurrent | | | | | | |
| | Geo. Extent: | Regional | | | | | | |
| | Intensity: | Medium | | | | | | |

##### *7.3.1.2.3.2 Operation Phase*

The demand for workforce will be minimal throughout the operation phase compared to the construction phase and will mostly be restricted to those needed to operate the facilities and perform necessary maintenance. However, the Project is anticipated to bring in more investors to the Project region in addition to the long-term procurement opportunities. İstanbul and Tekirdağ should expect development of local suppliers' capabilities, and the emergence of new economic sectors as a result of increasing investment.

In Türkiye, the road infrastructure for the connection of the Marmara and Eagan regions are insufficiently developed to meet the existing demand. During the operation phase of the Project, economic contribution to the national economy is anticipated with the contribution to the transportation of goods and materials.

The duration of the impact will be long-term considering the operation phase and the frequency of the impact will be recurrent for demand for goods, materials and services, continuous for contribution on national economy and infrequent for demand for workforce. The geographic extent of the impacts assessed as regional and national, respectively. The intensity of the impact will be low for workforce and goods, materials & services and high for contribution to national economy. Considering the expectations of the local communities the component sensitivity of the impact is assessed as medium-low for demand for workforce, medium for demand for workforce and materials and contribution to national economy. The reversibility of the impact is short-mid-term in the local level and irreversible for the national level.

As a result of the assessments, low-level positive impact for demand for workforce is expected since the number of workers to be employed will be minimized compared to the construction phase. The impact on demand for goods, is expected to be at the medium level. Very high positive impact value is expected for contribution to national economy by the Project. The impact assessment of the Project on the local economy and employment in the operation phase is provided in Table 262.

**Table 262: Project Actions and Related Impact Factors Potentially Affecting Economy and Employment During Operation Phase (Positive)**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Features | | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|---|
| Demand for workforce | Duration: | Very long | Medium-low | Reversibility | Short-mid-term | **Low** | Medium-low | **Low** |
| | Frequency: | Infrequent | | | | | | |
| | Geo. Extent: | Regional | | | | | | |
| | Intensity: | Low | | | | | | |
| Demand for goods, materials and services | Duration: | Very long | Medium | Reversibility | Short-mid-term | **Low** | Medium | **Medium** |
| | Frequency: | Recurrent | | | | | | |
| | Geo. Extent: | Regional | | | | | | |
| | Intensity: | Low | | | | | | |
| Contribution to national economy | Duration: | Very long | Medium | Reversibility | Irreversible | **Very High** | Medium high | **Very High** |
| | Frequency: | Continuous | | | | | | |
| | Geo. Extent: | National | | | | | | |
| | Intensity: | High | | | | | | |

#### *7.3.1.2.3.3 Decommissioning and Closure Phase*

No impacts related to economy and employment during the decommissioning phase are expected.

### 7.3.1.2.4 Monitoring

Monitoring measures will be implemented to assess the effectiveness of the specified measures, including:

- Regular monitoring of economic indicators and employment statistics to assess the Project's impacts on the local economy and employment rates.
- Assessment of training plans to determine their effectiveness in meeting Project objectives and improving worker skills.

- Documentation and tracking of grievances received, along with details of the issue, actions taken, and resolution status.
- Monitoring of employment records (contracts, employee register), which will be performance indicators for ESMS, to be prepared for the Project, and
- Monitoring of grievance records in accordance with the grievance mechanism to be produced for the Project.

KPIs listed in the Local Content Procedure, Supply Chain Management Plan and Subcontractor Management Plan will be tracked. In line with the plans and procedures, EPC Contractor will periodically report to ÇOK A.Ş. by quarterly reports which will summarize all issues about construction's environmental, health and safety and social performance. These reports will also contain issues related to local procurement performance.

#### *7.3.1.3 Land Use and Land-based Livelihoods*

This section assesses the potential impacts of the Project on lands, land use and land-based livelihoods. In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on lands.

The Project will require permanent acquisition of lands by expropriation. The Project may cause economic displacement and physical resettlement, however, at this stage, the magnitude of displacement is not completely known since the land acquisition files have not been prepared for the Project.

It should be noted that in Türkiye, the acquisition and the expropriation process are held in compliance with the Turkish Expropriation Law which does not include the rights of the informal land users, vulnerable people and the livelihood restoration.

Since the expropriation files were not prepared by the time of the ESIA studies, the analysis in this section is based on preliminary data and may not fully reflect the accurate impacts on land use.

The route selection and main design criteria for the Project were predetermined by authorities and addressed in the meetings conducted within the scope of the local EIA process. To address the limitations of the local EIA process in capturing input from Project-Affected Persons (PAPs) and other stakeholders, a comprehensive approach will be undertaken during the RAP studies to ensure that inclusive consultations are conducted.

According to the preliminary data provided by the Client regarding the land acquisition and expropriation process for the Project, which is planned to be conducted in three stages:

- Package 1: KM 70-105
- Package 2: KM: 0-35
- Package 3: KM: 35-70

The expropriation plans for Package 1 have already been submitted to the relevant cadastre directorates for cadastral technical controls.

A total of 560 parcels, covering an area of 4,499,838.05 m², will be acquired through expropriation. The parcels are classified as private and corporate lands (agricultural lands), legal entity lands belonging to institutions, treasury lands, meadow land, forest land, unregistered land, and road and stream. The detailed information on the land acquisition and parcels are provided in Social Baseline Chapter, Section 6.3.1.7.

#### 7.3.1.3.1 Impact Analysis

This section assesses the potential impacts of the Project on lands. The current land use of the AoI will be affected by the Project, the construction works of the Project, its components, and the associated facilities. Hence, a loss of both state and private lands is expected. The Project execution will require the permanent acquisition of lands by using expropriation, which is under the responsibility of KGM. Identification of the affected people and their lands, valuation and compensation are processed in compliance with the Turkish Expropriation Law. The Project is expected to cause economic displacement and physical resettlement. This section of the report aims to identify and assess the economic displacement-related impacts due to the land acquisition. The acquisition of lands is crucial in terms of economic displacement because it has a direct impact on private agricultural lands, pasture lands used by the local people, businesses in the local area, residential areas, forest lands and ecosystem usage, and animals and animal husbandry.

The Project's Resettlement Action Plan (RAP) will be developed in line with the IFC standards. Based on this approach, the RAP will define the measures and practices according to the Project commitments regarding Project entitlement, compensation rights, and land user status. The Project includes measures in accordance with all IFC PSs, particularly Performance Standards 4 and 5, to minimize resettlement impacts on the local people.

In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on private lands Table 263.

**Table 263: Impact Anticipations of the Residents on Private Lands**

| Province | District | Answer | Answer | Frequency | % |
|---|---|---|---|---|---|
| İstanbul | Silivri | Valid | Yes | 47 | 56.0 |
| | | | No | 36 | 42.9 |
| | | | No opinion | 1 | 1.2 |
| | | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Valid | Yes | 16 | 69.6 |
| | | | No | 3 | 13 |
| | | | No opinion | 4 | 17.4 |
| | | | Total | 23 | 100 |
| | Marmaraereğlisi | Valid | Yes | 11 | 64.7 |
| | | | No | 2 | 11.8 |
| | | | No opinion | 4 | 23.5 |
| | | | Total | 17 | 100 |
| | Süleymanpaşa | Valid | Yes | 27 | 52.9 |
| | | | No | 16 | 31.4 |
| | | | No opinion | 8 | 15.7 |
| | | | Total | 51 | 100 |
| | Malkara | Valid | Yes | 6 | 50 |
| | | | No | 2 | 16.7 |
| | | | No opinion | 4 | 33.3 |

| Province | District | Answer | Answer | Frequency | % |
|---|---|---|---|---|---|
| | | | Total | 12 | 100 |

In all districts, the locals mainly anticipate a negative impact on private lands due to the Project. Some do not have an opinion on the subject. They may not have an opinion because not all residents have private lands to be affected by the Project; thus, they do not acquire any information on the topic. The anticipation of negative impacts is more prominent in the settlements where agricultural production is the primary income source, and most of the population are farmers, or the settlements have many private lands subjected to expropriation Table 264.

**Table 264: Impact Anticipations of the Residents on the Loss of Pasture Lands**

| Province | District | Answer | Answer | Frequency | % |
|---|---|---|---|---|---|
| İstanbul | Silivri | Valid | Yes | 30 | 36.6 |
| | | | No | 50 | 61 |
| | | | No opinion | 2 | 2.4 |
| | | | Total | 82 | 100 |
| Tekirdağ | Çorlu | Valid | Yes | 13 | 56.5 |
| | | | No | 10 | 43.5 |
| | | | Total | 23 | 100 |
| | Marmaraereğlisi | Valid | Yes | 11 | 64.7 |
| | | | No | 5 | 29.4 |
| | | | No opinion | 1 | 5.9 |
| | | | Total | 17 | 100 |
| | Süleymanpaşa | Valid | Yes | 18 | 35.3 |
| | | | No | 32 | 62.7 |
| | | | No opinion | 1 | 2 |
| | | | Total | 51 | 100 |
| | Malkara | Valid | Yes | 7 | 58.3 |
| | | | No | 4 | 33.3 |
| | | | No opinion | 1 | 8.3 |
| | | | Total | 12 | 100 |

Most of the participants think that there will be no physical displacement due to the Project. Also, some people do not have any opinion on the issue, which may be again because they will not experience physical displacement of properties (Table 265).

**Table 265: Impact Anticipations of the Residents on Physical Displacement on Properties**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 14 | 16.7 |
| | | No | 68 | 81.0 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | No opinion | 2 | 2.4 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 4 | 17.4 |
| | | No | 16 | 69.6 |
| | | No opinion | 3 | 13 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 4 | 23.5 |
| | | No | 10 | 58.8 |
| | | No opinion | 3 | 17.6 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 8 | 15.7 |
| | | No | 38 | 74.5 |
| | | No opinion | 5 | 9.8 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 4 | 33.3 |
| | | No | 6 | 50 |
| | | No opinion | 2 | 16.7 |
| | | Total | 12 | 100 |

### *Impacts on Income Sources of the Settlements*

The majority of the participants from all five districts stated that they do not expect physical displacement of properties. The locals who expect negative impacts on agricultural income are mostly in Marmaraereğlisi and Süleymanpaşa districts, where agricultural production is predominant. They stated that if the majority of lands in the AoI are affected, there will be a negative impact on agricultural income (Table 266).

**Table 266: Impact Anticipations of the Residents on Income from Agriculture**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 28 | 33.3 |
| | | No | 55 | 65.5 |
| | | No opinion | 1 | 1.2 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 12 | 52.2 |
| | | No | 9 | 39.1 |
| | | No opinion | 2 | 8.7 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 9 | 52.9 |
| | | No | 6 | 35.3 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | No opinion | 2 | 11.8 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 30 | 58.8 |
| | | No | 17 | 33.3 |
| | | No opinion | 4 | 7.8 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 5 | 41.7 |
| | | No | 5 | 41.7 |
| | | No opinion | 2 | 16,6 |
| | | Total | 12 | 100 |

The impact on animal husbandry is related to the type of animal husbandry, whether people engage in cattle farming or sheep & goat farming. Since cattle farming does not acquire grazing, it is unrelated to the land acquisition process. Thus, in the settlements where cattle farming is predominant, the Project might not significantly impact animal husbandry. Mostly, the local people in the districts think there will be no significant impact on animal husbandry due to the Project. Other than that, some of the locals in the districts think that animal husbandry would also be impacted if the Project affects private and pasture lands (Table 267).

**Table 267: Impact Anticipations of the Residents on Income from Animal Husbandry**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 9 | 10.7 |
| | | No | 74 | 88.1 |
| | | No opinion | 1 | 1.2 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 6 | 26.1 |
| | | No | 17 | 73.9 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 7 | 41.2 |
| | | No | 9 | 52.9 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 13 | 25.5 |
| | | No | 37 | 72.5 |
| | | No opinion | 1 | 2 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 4 | 33.3 |
| | | No | 7 | 58.3 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | No opinion | 1 | 8.4 |
| | | Total | 12 | 100 |

The local people in the districts do not anticipate any notable impact on fishing in the local area due to the Project mainly because, according to the results of the socioeconomic baseline study, there are no fishing activities in the settlements of the AoI as an income-generating activity; instead, a few households engage in fishing for household consumption. Only 2% of the participants from Süleymanpaşa stated that their income from fishing would be affected from the Project (Table 268).

**Table 268: Impact Anticipations of the Residents on Income from Fishing**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | No | 84 | 100 |
| Tekirdağ | Çorlu | No | 23 | 100 |
| | Marmaraereğlisi | No | 17 | 100 |
| | Süleymanpaşa | No | 50 | 98 |
| | Malkara | No | 12 | 100 |

In the Silivri District, more people expect development in the tourism sector than other districts, due to the Project because the district is located in the city centre. They stated that it would be easier for people from other cities to visit İstanbul after the Project. There are also locals who anticipate positive impact on tourism in the Süleymanpaşa and Malkara However, in the Çorlu and Marmaraereğlisi Districts, the local people do not anticipate an impact on tourism due to the Project (Table 269).

**Table 269: Impact Anticipations of the Residents on Income from Tourism**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 16 | 19 |
| | | No | 68 | 81 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | No | 23 | 100 |
| | Marmaraereğlisi | No | 17 | 100 |
| | Süleymanpaşa | No | 44 | 86.3 |
| | Malkara | No | 10 | 83.3 |

### *Impact on Businesses*

It should be noted that by the preparation of the ESIA report, detailed land acquisition files were not prepared by KGM and RAP is not prepared as of July 2024. After the preparation of the RAP and the detailed expropriation files, this chapter may require revision accordingly.

There might be businesses whose structures or lands might be impacted by the Project in the settlements in the AoI.

#### *7.3.1.3.1.1 Construction Phase*

#### *Impacts on Private Lands and Businesses*

The Project includes approximately 105 km motorway and in total 330 Project units including 58 overpasses, 29 portal underpasses, 14 girder underpasses, 219 culverts and 10 interchanges.

The existing land use of the AoI of the Project will be affected by the construction of the Project and its components as well as by the associated facilities. Loss of public and private lands is expected since the Project execution will require partial or complete acquisition of land.

The Project execution will require permanent acquisition of land by using expropriation. The Project is expected to cause economic displacement and physical resettlement, however, at this stage, the magnitude of displacement is not completely known since the land acquisition files have not been prepared for the Project.

Measures to minimize the impacts on land use are outlined in section 7.3.1.3.2. Once the expropriation lists are finalized, the Resettlement Action Plan will be prepared, identifying the affected individuals and ensuring that impacts are minimized in accordance with IFC standards.

The settlements where expropriation is planned are presented in Table 270.

**Table 270: Planned Settlement List for Expropriation**

| Province | District | Neighbourhood |
|---|---|---|
| **İstanbul** | **Silivri** | Değirmenköy Fevzipaşa |
| | | Alipaşa |
| | | Çeltik |
| | | Yolçatı |
| | | Gümüşyaka |
| | | Çanta Balaban |
| | | Semizkumlar |
| | | Çanta Sancaktepe |
| **Tekirdağ** | **Çorlu** | Seymen |
| | | Şahpaz |
| | | Türkgücü |
| | | Yenice |
| | | Maksutlu |
| **Tekirdağ** | **Marmaraereğlisi** | Türkmenli |
| | | Yakuplu |
| | | Çeşmeli |

| Province | District | Neighbourhood |
|---|---|---|
| **Tekirdağ** | **Süleymanpaşa** | Aydoğdu |
| | | Karaevli |
| | | Gazioğlu |
| | | Husunlu |
| | | Çiftlikönü (Gündoğdu) |
| | | İstiklal (Eskicami) |
| | | Karahisarlı |
| | | Kayı |
| | | Yağcı |
| | | Zafer |
| | | Seymenli |
| | | Güveçli |
| | | Nusratfakı |
| | | İnecik |
| | | Nusratlı |
| | | Mahramlı |
| | | Kınıklar |
| **Tekirdağ** | **Malkara** | Yenice |
| | | Hereke |
| | | Ahievren |

According to the expropriation information provided for Package 1, there are 438 affected private lands and 1009 PAPs, which are presented in Table 108.

**Table 271: Project Affected Private Lands by Settlement**

| Province | District | Settlement | Expropriation Package | Number of Affected Parcels (private and corporate) | Number of landowners |
|---|---|---|---|---|---|
| Tekirdağ | Süleymanpaşa | Seymenli | Package 1 | 42 | 166 |
| | | Güveçli | Package 1 | 39 | 101 |
| | | Nusratlı | Package 1 | 27 | 83 |
| | | Karahisarlı | Package 1 | 17 | 85 |
| | | Nusratfakı | Package 1 | 47 | 114 |
| | | İnecik | Package 1 | 96 | 257 |
| | | Akçahalil | Package 1 | 54 | 11 |
| | | Kınıklar | Package 1 | 6 | 109 |

| Province | District | Settlement | Expropriation Package | Number of Affected Parcels (private and corporate) | Number of landowners |
|---|---|---|---|---|---|
| | Malkara | Yenice | Package 1 | 37 | 58 |
| | | Hereke | Package 1 | 30 | 63 |
| | | Ahievren | Package 1 | 43 | 81 |
| **Total** | | | | **438** | **1009** |

## *Ecosystem Services*

Since the expropriation lists were not finalized at the time of the ESIA drafting, it is not possible to comment on the total area of pasture, agricultural lands and forests that will be affected by the Project. According to the expropriation information for Package 1, a total of 76 parcels covering 1,272,269.23 $m^2$ area will be affected by the Project's land acquisition and expropriation and has the potential to be utilized for ecosystem services.

Studies indicate that the Project traverses agricultural lands more intensively compared to forest and pasture areas. Measures to minimize the impacts on ecosystem services are outlined in Section 7.3.1.3.2. Once the expropriation lists are finalized, the Resettlement Action Plan will be prepared, identifying the affected individuals and ensuring that impacts are minimized in accordance with IFC standards.

**Table 272: Project Affected Non-Private Parcels**

| Province | District | Settlement | Treasury Land | Meadow Land | Forest Land | Road – Stream |
|---|---|---|---|---|---|---|
| Tekirdağ | Süleymanpaşa | Seymenli | 7 | 2 | 5 | 2 |
| | | Güveçli | - | 1 | 2 | 3 |
| | | Nusratlı | 4 | - | - | 1 |
| | | Karahisarlı | - | - | 1 | 2 |
| | | Nusratfakı | 4 | 2 | - | 7 |
| | | İnecik | 2 | 2 | 4 | 6 |
| | | Akçahalil | 1 | - | 8 | 5 |
| | | Kınıklar | 2 | - | 4 | 2 |
| | Malkara | Yenice | 1 | - | 3 | 2 |
| | | Hereke | - | - | - | 7 |
| | | Ahievren | - | - | - | 4 |
| Total Number of Parcels | | | 21 | 7 | 27 | 41 |
| Total Surface Areas ($m^2$) | | | 17,976.42 | 247,661.53 | 923,514.14 | 83117 |

Ecosystem services are classified into four types according to IFC PS 6. Provisioning services (Type I) encompass resources such as agricultural land, pastureland, beekeeping, forest products, and fishing, all of

which local communities use for income, household consumption, and medicinal purposes. Regulating services (Type II) involve water resources, which are essential for the local population.

Type III and IV are the: (iii) cultural services, which are the nonmaterial benefits people obtain from ecosystems; and (iv) supporting services, which are the natural processes that maintain the other services.

The following methodology has been adopted to assess the defined impacts on ecosystem services:

- Step 1: Identify Relevant Ecosystem Services
  - Determine the ecosystem services potentially affected by the Project.
- Step 2: Prioritize Relevant Ecosystem Services
  - Evaluate and rank ecosystem services based on their relevance with the Project.
- Step 3: Establish Baseline for Priority Ecosystem Services
  - Collect and analyse baseline data to understand the current status of the prioritized services.
- Step 4: Define Priority Levels
  - Categorize ecosystem services based on their importance he level of impact expected from the Project.
- Step 5: Assess Project Impacts
  - Evaluate the potential impacts of the Project on the identified and prioritized ecosystem services.
- Step 6: Define Mitigation Measures
  - Develop and implement mitigation measures to minimize any negative impacts on the prioritized ecosystem services.

While ecosystem services encompass a range of benefits, the focus of this Project is primarily on Provisioning Services (Type I) and Regulating Services (Type II), as they directly relate to the activities and environmental aspects of the Project and there are no project activities or effects related to cultural aspects, such as sacred or recreational sites (Type III), or the fundamental natural processes like soil formation or nutrient cycling (Type IV).

The social field study highlighted the agricultural usage is the dominant in the Project AoI. Variation in forest resource usage across settlements also identified. Beekeeping is a commercial income source only in Yolçatı, Seymen, Maksutlu, Gazioğlu, Hacıköy, and Akçahalil, and in other settlements it is carried out for hobby purposes or as household consumption.

The assessment in this section focuses on Provisioning Services (Type I) and Regulating Services (Type II), as outlined above, and the potential impacts on these ecosystem services are discussed.

**Table 273: Project Impacts Related to Ecosystem Services**

| Service Provided | Ecosystem Service Type | Description | Impact Significance (Prioritization) | Mitigation |
|---|---|---|---|---|
| Agricultural land use, pastureland use, forest product | Provisioning Services (Type I) | Agricultural and pastureland use are the predominant livelihood sources in the settlements. Forest use and beekeeping are present in some settlements. Certain | **High** – direct impact due to land acquisition and | RAP including LRP will be developed to provide fair compensation, |

| Service Provided | Ecosystem Service Type | Description | Impact Significance (Prioritization) | Mitigation |
|---|---|---|---|---|
| collection, beekeeping, fishing | | agricultural lands and pasturelands will be acquired for the Project. Forest use and beekeeping activities are not common within the Project AoI. | livelihood disruption | alternative livelihood support, and resettlement assistance.[230] |
| Water sources | Regulating Services (Type II) | Some settlements in the regions uses spring and well water. These water sources are not expected to be impacted by Project activities since no water abstraction is anticipated for the Project, and surface waters will not be used as a water supply. As discussed in the Physical Impact section, if the construction of a groundwater well becomes necessary, this issue will be included in Groundwater Management Plan which will be prepared and implemented, and the impact factor of groundwater depletion will be assessed. | **Low** – as no impact is expected | Regular monitoring of water sources and water quality will be conducted to ensure no indirect impacts occur.<br><br>Development and implementation of Groundwater Management Plan. |
| Sacred sites, scenic landscapes, and recreational areas | Cultural Services (Type III) | No cultural services, such as spiritual or recreational land use, are present in the Project Area. Thus, these services are not impacted by the Project. | None | No mitigation needed. |
| Natural processes such as nutrient cycling, pollination, and habitat provision | Supporting Services (Type IV) | No significant supporting services are identified in the Project Area. Therefore, the Project does not affect these services. | None | No mitigation needed. |

The Project's potential impacts are mainly associated with provisioning services. The Project will acquire certain agricultural lands and pasturelands, which may disrupt these activities. To mitigate this, RAP, including livelihood restoration will be implemented to provide compensation and support for alternative livelihoods. Stakeholders will be engaged in planning mitigation measures and ensure community participation throughout the process. Stakeholder engagement will be initiated at the earliest possible stage, enabling the identification and incorporation of additional mitigation measures as necessary.

[230] Additional mitigation measures are provided in Section 7.3.1.3.2, "Mitigation Measures."

#### 7.3.1.3.1.2 Operation Phase

During operation phase, the most likely potential impact would be the access to the agricultural lands in case of absence of the insufficient passageways including overpass and underpass. According to the results of the socioeconomic surveys, all settlements expect enough access points to the agricultural lands.

#### 7.3.1.3.1.3 Decommissioning and Closure Phase

During the decommissioning and closure phase, the lands that will be used for the Project should be rehabilitated and transferred to the local communities for the agricultural production purposes.

### 7.3.1.3.2 Mitigation Measures

The following mitigation measures will be implemented to minimize or reduce the negative impacts on land use and land-based livelihoods due to the Project:

- Impacts on lands will be minimized as far as possible by keeping the Project construction footprint as narrow as possible, and efficiently restoring any damaged areas.
- Physical and economic displacement impacts will be minimized during the design phase of the Project.
- RAP will be prepared and implemented to bridge the gaps between Turkish Expropriation Law and IFC PS-5.
- The Project will conduct broad consultations with the PAPs, affected communities, and other interested stakeholders. Detailed visual materials and KMZ files of the route will be shared with local communities to gather their feedback, particularly regarding underpasses in settlements and potential barriers to access ecosystem services. Their input will be incorporated into the further detailed design and mitigation measures of the Project.
- Vulnerable people that will be affected by the land acquisition will be determined and specific assistance will be provided including transportation and legal.
- There are seasonal residents (approximately 10 people) coming for agricultural production in Yukarısırt Neighbourhood in Muratlı, Tekirdağ. This group will be considered during the preconstruction survey and their loss will be compensated accordingly if there are affected by the land acquisition.
- During the recruitment process priority will be provided to people who lost their livelihoods as a result of the establishment of the Project.
- All construction works will be continued within the borders of the designated areas and in case of an unplanned damage, loss of the affected PAPs will be compensated by the contractors.
- Before the start of the construction, the landowners/users will be allowed to harvest their crops and they will be informed in a timely manner.
- A Community Liaison Officer will be hired and the stakeholder engagement and collect grievances.
- Any business losses will be compensated at a full replacement value.
- If compensation alone is not sufficient to restore livelihoods, livelihood restoration in accordance with IFC requirements will be implemented.
- A Community Grievance Mechanism will be established.
- All of the disturbed sites will be rehabilitated as appropriate and agreed upon, following the completion of construction works.

- Access roads will be constructed in parallel to the motorway near agricultural areas and pasture areas to prevent the livelihood impacts, where possible.
- Any loss of or damage to crops caused by the Project activities will be compensated.
- During operation it is essential that the water intake structures, dams, pipelines, canals, and other structures be regularly inspected and be periodically maintained to ensure proper conveyance of water, avoid stagnation, and prevent flooding and damages.
- Local authorities and the villagers will be informed before the construction activities within the forest land to not create any limitation on firewood collection, herbs collection and hunting.
- Monitoring will be held within the scope of the RAP to analyse the livelihood impacts of the beekeepers.
- Unviable lands will also be surveyed during the asset inventory survey. In addition to the criteria specified in the expropriation law, these lands will be expropriated if requested by the owners, together with the reasoned petitions submitted by the owners to KGM.
- A RAP will be developed and implemented and one of the main target groups will be the ecosystem users. Additional field survey will be needed in order to identify users in detail.
- A Resettlement Framework aligned with IFC PS5 will be developed. This framework will outline the guidelines for managing land acquisition and resettlement, ensuring that the process respects the rights of affected individuals while adhering to relevant legal and international standards.
- Following the completion of the RAP and LRP, an independent third-party audit (completion audit) should be conducted to evaluate the full implementation of these plans. The RAP Completion Audit will verify that all commitments have been met and that resettled individuals have received the compensation and support promised under the resettlement framework.
- To address the limitations of the local EIA process in capturing input from PAPs and other stakeholders, a comprehensive approach will be undertaken during the RAP studies to ensure that inclusive consultations are conducted.
- RAP field studies will be conducted to identify any social or livelihood impacts.
- Stakeholder feedback will be integrated into the mitigation strategies in the RAP.
- The Project will ensure that cumulative impacts on affected people and communities, in the context of existing, planned, or reasonably foreseeable developments, are assessed. Since expropriation plans are still under finalization, the cumulative impacts will be evaluated as part of the RAP. The RAP studies will include an assessment of these cumulative impacts, ensuring that all relevant factors are taken into account cumulatively.
- Access to agricultural lands, forests, water bodies, and other areas where ecosystem services are utilized will be maintained, ensuring that no physical barriers impede usage.
- Ecosystem service usage will be regularly monitored, with local communities engaged to identify and address emerging issues promptly.
- Sustainable practices will be promoted among users to prevent the overexploitation and degradation of resources due to increased demand.
- Water sources and water quality will be regularly monitored to ensure no indirect impacts occur.

- The beehives and beekeepers are usually affected by the Project in terms of relocation. The relocation processes take place before the construction phase due to the land acquisition.
- Additional detailed field surveys will be conducted as part of the Resettlement Action Plan (RAP), including Livelihood Restoration Plan (LRP) studies. These surveys will identify the activities that need to be considered under ecosystem services, which are classified into four types according to IFC PS 6.
- A RAP, including livelihood restoration, will be developed with detailed field survey data and implemented to provide compensation and support for alternative livelihoods.
- Stakeholders will be engaged prior to construction to better identify ecosystem services, and it will be ensured that community participation is maintained throughout the management of the associated impacts.
- Continues stakeholder engagement will be ensured by the community liaison officer and stakeholders will be engaged in planning mitigation measures, ensuring community participation throughout the process.

#### 7.3.1.3.3 Residual Impacts

##### *7.3.1.3.3.1 Construction Phase*

The duration of the physical displacement and economic displacement impact factors will be very long term (since the land acquisition will be permanent) and duration assessed as long for the access to the ecosystem services since it is limited to the construction phase. The frequency of impacts is considered as single event, or continuous, but the economic displacement and the access to the ecosystem impact factors has a frequent duration, before the implementation of the proposed mitigation measures. The geographic extent assessed as local for all impact factors. The intensity of the impacts will be vary from medium to low. All impacts due to the resettlement and land acquisition are negative in nature. The component sensitivity is assessed as very high regarding for physical displacement, economic displacement, impact on businesses and as medium-high for access to ecosystem services. The reversibility of the impact factors is long term.

Impacts on the land acquisition and resettlement is expected to reduce from very high or high to medium with the compensation provided to the PAPs as sensitive receptors in compliance with IFC PS-5. For the access to the ecosystem services residual impact assessed as low (Table 274).

**Table 274: Residual impact Assessment Matrix for Resettlement and Land Acquisition during the Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Physical displacement | Duration: | Very long | Very high | Long term | **High** | Medium | **Medium** |
| | Frequency: | Single Event | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Economic displacement | Duration: | Very long | Very high | Long term | **Very High** | Medium high | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Impact on businesses | Duration: | Very long | Very high | Long term | **High** | Medium high | **Medium** |
| | Frequency: | Single Event | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Access to ecosystem services | Duration: | Long | Medium-high | Long term | **High** | High | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Utilisation of ecosystem services | Duration: | Very long | Very high | Long term | **Very High** | Medium high | **Medium** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

#### *7.3.1.3.3.2 Operation Phase*

The Project will involve 58 overpasses, 29 portal underpasses, 14 girder underpasses, 219 culverts and 10 interchanges to provide access to the lands and the minimize the economic displacement impacts of the Project. The impact factor assessed as local level (geographic extent), very long-term (duration) and continuous (frequency) access impact is expected. The sensitivity is assessed as medium-high, intensity is assessed as medium and the reversibility is assessed as irreversible for access to land impact factor. Prior to mitigation, the impact value is calculated as very high; however, with sufficient access points designed, it is projected that the impact will only slightly decrease to a medium level (Table 275).

**Table 275: Residual Impact Assessment Matrix for Resettlement and Land Acquisition during Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Access to land (agricultural and pasturelands) | Duration: | Very long | Medium-high | Irreversible | **Very High** | Medium high | **Medium** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

#### *7.3.1.3.3.3 Decommissioning and Closure Phase*

During decommissioning phase, the route can be rehabilitated and converted alternative uses by local communities.

### 7.3.1.3.4 Monitoring

The following monitoring measures will be implemented to evaluate the impacts of the Project on land use and land-based livelihoods and assess the effectiveness of mitigation measures:

- Overall spending on land acquisition and on a per household basis,
- Number of employees and consultants involved to the process,
- Total number of private and governmental lands,
- Total numbers of untitled land,
- Total number of vulnerable people,
- Number of agreed and non- agreed land plots,

- Number and type of grievances, including legal actions arising from expropriation,
- Number of vulnerable persons/households assisted,
- Number of people who were able to restore their livelihoods defined in RAP according to the eligibility criteria,
- Conducting the monitoring activities as defined in RAP and tracking KPIs,
- Verification of the number of forest land restrictions caused by Project activities and verification of the number of grievances received and percentage of grievances resolved positively, and
- The land acquisition process in under the control of KGM not ÇOK A.Ş.. ÇOK A.Ş. is legally not the party that can perform the land acquisition, ÇOK A.Ş. will have to establish close relations with KGM and guide them to make the process in accordance with international standards,
- Grievance mechanism to be implemented will document and address any issues raised by PAPs, with reports generated quarterly to review and adjust mitigation measures as needed.

#### *7.3.1.4 Community Health and Safety*

The Project may have various impacts on community health, safety, and security. In terms of community health and safety, the activities in the construction and operation phases of the Project were evaluated separately, the potential risks were determined, and mitigation measures were developed. Regarding community health and safety, the following topics have been identified as potential impacts of the Project and included in the social impact assessment.

- The impacts on traffic density and rise in accidents (Traffic and Pedestrian Safety),
- Health and safety impact due to construction activities (noise, dust, odour etc.)
- Risk of Communicable Diseases in Campsites and Close Settlement,
- Security Issues,
- Infrastructure and Equipment Design,
- Transport of Dangerous Goods.

##### 7.3.1.4.1 Impact Analysis

In this section, the potential impacts of the Project on issues regarding community health and safety are assessed. In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on health.

According to the results of the social field study, it has been observed that the local people mostly do not anticipate any impacts on health in the local area due to the Project. The ones who anticipate a positive impact on health in the local area stated that access to health services might be improved in terms of transportation services through the Project (Table 276).

**Table 276: Impact Anticipations of the Residents on Health**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 25 | 29.8 |
| | | No | 57 | 67.9 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | No opinion | 2 | 2.4 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 4 | 17.4 |
| | | No | 19 | 82.6 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 3 | 17.6 |
| | | No | 14 | 82.4 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 6 | 11.8 |
| | | No | 45 | 88.2 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 4 | 33.3 |
| | | No | 8 | 66.7 |
| | | Total | 12 | 100 |

The local people have concerns about the traffic impact due to the Project. The expected traffic is concentrated both on the construction and operation phases of the Project. During the construction phase, concerns about the influx of construction equipment and vehicles to the local area are prominent, whereas the increased traffic on the road is anticipated during the operation phase (Table 277).

**Table 277: Impact Anticipations of the Residents on Traffic**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 48 | 57.1 |
| | | No | 36 | 42.9 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 15 | 65.2 |
| | | No | 8 | 34.8 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 8 | 47.1 |
| | | No | 8 | 47.1 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 28 | 54.9 |
| | | No | 23 | 45.1 |
| | | No opinion | 0 | 0 |
| | | Total | 51 | 100 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | Malkara | Yes | 8 | 66.7 |
| | | No | 4 | 33.3 |
| | | Total | 12 | 100 |

The expectations of security problems due to the project are highest among participants from Çorlu and Marmaraereğlisi. This could be due to the already existing security concerns of the local population.

**Table 278: Impact Anticipations of the Residents on Security Problems**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 26 | 31 |
| | | No | 57 | 67.9 |
| | | No opinion | 1 | 1.1 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 13 | 56.5 |
| | | No | 10 | 43.5 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 8 | 47.1 |
| | | No | 8 | 47.1 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 17 | 33.3 |
| | | No | 33 | 64.7 |
| | | No opinion | 1 | 2 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 2 | 16.7 |
| | | No | 9 | 75 |
| | | No opinion | 1 | 8.3 |
| | | Total | 12 | 100 |

According to Table 279,majority of the participants in all districts anticipate impact of noise during both the construction and operation phases of the Project.

**Table 279: Impact Anticipations of the Residents on Noise**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 45 | 53.6 |
| | | No | 39 | 46.4 |
| | | Total | 84 | 100 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| Tekirdağ | Çorlu | Yes | 14 | 60.9 |
| | | No | 8 | 34.8 |
| | | No opinion | 1 | 4.3 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 10 | 58.8 |
| | | No | 7 | 41.2 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 27 | 52.9 |
| | | No | 24 | 47.1 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 6 | 50 |
| | | No | 6 | 50 |
| | | Total | 12 | 100 |

As seen in Table 280, Majority of the participants in all districts anticipate impact of dust especially during the construction phase of the Project due to construction works.

**Table 280: Impact Anticipations of the Residents on Dust**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 47 | 56 |
| | | No | 37 | 44 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 16 | 69.6 |
| | | No | 7 | 30.4 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 12 | 70.6 |
| | | No | 5 | 29.4 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 28 | 54.9 |
| | | No | 23 | 45.1 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 5 | 41.7 |
| | | No | 7 | 58.3 |
| | | Total | 12 | 100 |

The local people of the settlements do not anticipate any notable impact on water quality of the local area due to the Project (Table 281).

**Table 281: Impact Anticipations of the Residents on Water Quality**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 11 | 13.1 |
| | | No | 72 | 85.7 |
| | | No opinion | 1 | 1.2 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 3 | 13.0 |
| | | No | 19 | 82.6 |
| | | No opinion | 1 | 4.3 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 4 | 23.5 |
| | | No | 13 | 76.5 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 6 | 11.8 |
| | | No | 44 | 86.3 |
| | | No opinion | 1 | 2 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 1 | 8.3 |
| | | No | 11 | 91.7 |
| | | Total | 12 | 100 |

The local people of the settlements do not anticipate any notable impact on waste problems of the local area due to the Project (Table 282).

**Table 282: Impact Anticipations of the Residents on Waste Problems**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 22 | 26.2 |
| | | No | 62 | 73.8 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 6 | 26.1 |
| | | No | 16 | 69.6 |
| | | No opinion | 1 | 4.3 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 6 | 35.3 |
| | | No | 11 | 64.7 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 9 | 17.6 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | No | 42 | 82.4 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 1 | 8.3 |
| | | No | 11 | 91.7 |
| | | Total | 12 | 100 |

#### *7.3.1.4.1.1 Construction Phase*

##### *Traffic*

One potential impact of the Project on community health and safety is expected to be the traffic density and rise in accidents, which is also related to vehicle increases due to construction works. Traffic-related risk factors, which threaten human health and the environment, are generally caused by driver error. However, issues regarding regular maintenance of vehicles, road design, and construction contribute to traffic-related risk factors. The traffic-related impacts are assessed, and mitigation measures are proposed in detail in the Traffic section-7.1.11 Chapter of the ESIA.

##### *Risk of Communicable Diseases*

Another potential impact of the Project on community health and safety is related to the expected population influx, especially in the construction phase of the Project. Considering that many workers will be accommodated together during the construction phase of the Project and a population influx is expected from outside the local area, protection and prevention measures for both community and employee health will be implemented under the Community Health, Safety and Security Procedure throughout the Project phases. The population increase may lead to the spread of infectious and communicable diseases. As previously indicated in the socioeconomic baseline study, some settlements do not have health units, which makes these areas highly sensitive in case of a possible infectious disease. Another source of communicable diseases may be inadequate household waste management. During the social field study, inadequate waste management in the camp areas was another concern raised by some of the interviewed residents. Hence, waste management control is included in the mitigation measures.

##### *Security*

During the construction phase of the Project, security services will be needed on the site. According to the data obtained from the social field study, there are security personnel who obtained certification for private security living in the settlements located in the AoI. Security personnel who are already part of the community and familiar with local customs may serve as a positive and visible point of contact between the Project and the local community.

##### *Infrastructure and Equipment Design*

Design of the structures are directly related to community safety as well as the safety of the workers. For the construction phase, camp sites will be used for worker's accommodation and the structural safety becomes and important issues for this area. Additionally structural safety of the motorway service facilities is an important issue for the security and safety of the community.

##### *Transport of Dangerous Goods*

Transportation of hazardous materials may be required for the Project's construction activities. If not conducted properly, accidents involving the transportation of hazardous or dangerous goods could negatively impact the local community.

### *Blasting*

During the construction phase of the Project, blasting activities will take place in quarries. There will be no blasting for the route construction activities. The locations of the vibration sources (i.e., where the blasting activities will be carried out) and the distance of the nearest receptor to the vibration source are presented in Table 283. The detailed information on blasting works and vibration impacts are assessed in 7.1.10 Chapter of the ESIA.

**Table 283: Community Health and Safety Impacts - Blasting Works**

| Vibration Source | Blasting Location | Distance to the Nearest Receptor (m) | Settlement Name |
|---|---|---|---|
| Quarry | Dana Mandıra Quarry | 40 | Danamandıra |
| | Muratlı Quarry | 320 | Muratlı |
| | 68+000 Quarry | 1,200 | Yağcı |
| | Osmanlı Quarry | 550 | Osmanlı |
| | Dereköy Quarry | 390 | Dereköy |
| | Tepeköy Quarry | 800 | Çengelli |

#### *7.3.1.4.1.2 Operation Phase*

The impact of traffic density due to the Project construction activities is expected to disappear during the operation phase. During the operation phase of the Project, motorway traffic impacts are important for the community members, especially for the potential trespasses. Additionally, an increased traffic volume in the motorway service facilities is expected, which requires appropriate management controls. Another operational impact on the community members would be the infrastructure and equipment design and safety and malfunction in the units which can impact not only the workers but also the community members.

Also, during the operation phase, crossings along the motorway may present significant safety risks for both pedestrians and drivers. Without properly designed and managed crossings, the likelihood of accidents, restricted access, and potential conflicts between vehicles and pedestrians can increase.

#### *7.3.1.4.1.3 Decommissioning and Closure Phase*

Similar to the construction phase, during the decommissioning phase of the Project, there might be the impact of increased traffic on community health and safety.

### 7.3.1.4.2 Mitigation Measures

Community Health, Safety and Security Procedure of the Malkara-Çanakkale Motorway Project (developed by ÇOK A.Ş.) will be reviewed and revised according to the Project Standards, updated, and implemented for the Project to identify and assess adverse implications of the Project on potentially affected communities and provide protection, prevention, and mitigation measures for the potential risks.

The accident/incident reporting and investigation process to be established in the Project will include the potential incidents and injuries to the community members associated with the construction and operation of the Project.

### *Traffic*

- Transport Control and Site Access Procedure of the Malkara-Çanakkale Motorway Project (developed by ÇOK A.Ş.) will be reviewed and revised according to the Project Standards, updated and implemented for the Project.
- Traffic Management Plan will be developed and implemented for the Project.
- The entire route, which will be used for transportation and materials, will be determined following the finalization of the route design. According to the desktop analyses, there was expected to be an increase in traffic on the routes where the campsite is located. Following the determination of the route, this information will be processed into the Traffic Management Plan, and the information will be shared with the relevant institutions and communities.
- Management Measures, Vehicle Maintenance and Inspection Measures, and Driving Safety Measures of the Project-specific Traffic Management Plan will be implemented, including on-site and off-site traffic safety measures.
- Construction zones will be clearly identified with appropriate visual means, such as reflective barriers, flashing signs, and fences.
- Within the scope of the Project, the identification of roads for heavy vehicle passage and risk analyses on routes will be updated.
- The construction activities on the existing roads will only start after the relevant permits are obtained; all necessary precautions will be taken as signage, barrier, fence, lighting,
- Vulnerable areas such as schools and hospitals will be identified for construction traffic access planning, with vehicles being monitored via a vehicle tracking system.
- Changes in the condition of the roads will be monitored regularly, and road improvement works will be carried out when necessary.
- In order to minimise off-site traffic, the Contractor will prioritise the determination of excavation material storage areas within the expropriation corridor of the motorway and the selection of quarries and borrow quarries with the least possible transport distance.
- Duration of traffic density, dense points, and information will be given to the local people by mukhtars or by holding safety meetings in the affected settlements.
- The routes of the roads that will be used and the peak hours of the usage of the roads will be shared with village heads and management of the schools.
- In the Project SEP, these information-sharing methods and schedules will be defined.
- Safe pedestrian crossings will be designated with clearly marked pathways, adequate lighting, and, where feasible, pedestrian overpasses or underpasses.
- Proper traffic signage and barriers will be installed to guide vehicles and reduce speed near motorway crossings, enhancing safety for all motorway users.

- Strategically located crossings (overpasses or underpasses) will be planned and constructed at intervals that allow easy access to ecosystem services, lands, and other essential resources.
- In order to assess and eliminate potential hazards regarding the use of underpasses and overpasses built for traffic, pedestrians, and livestock, the following measures will be implemented:
  - Regular checks will be conducted for visibility, lighting, and drainage issues, particularly after heavy rainfall.
  - Routine maintenance will be carried out to address lighting, drainage, and structural issues.
  - Safe interaction between vehicles, pedestrians, and livestock will be monitored and managed.
- The Project should designate a dedicated role within the EPC Contractor to oversee traffic and road safety during the construction phase. This role will be responsible for implementing traffic management plans, coordinating safety protocols, and ensuring compliance with road safety standards throughout construction activities.

### *Communicable Diseases*

The population influx due to the Project may contribute to a rise in communicable and infectious diseases. To prevent the spread of such illnesses, the following measures need to be implemented:

- Pre-employment health screening and regular medical checks of workers will be conducted as per Turkish regulatory requirements.
- Adequate hygiene facilities, such as handwashing stations and sanitation equipment, will be provided throughout the Project site.
- Shared facilities and common areas will be regularly disinfected to minimize the spread of pathogens.
- Isolation protocols will be established for individuals displaying symptoms of illness to prevent transmission.
- Regular cleaning principles will be applied across the Project site to maintain hygiene standards.
- Collaboration with local healthcare authorities will facilitate rapid response and containment in case of disease outbreaks.
- Workers will be encouraged to use social distancing measures and personal protective equipment (PPE) to reduce the risk of transmission.
- Employee training will be provided to raise awareness and promote healthy lifestyles among workers and the community.
- Health and Safety Management Plan should be prepared for the Project to include the medical surveillance.
- Control of Substances Hazardous to Health Procedure of the Malkara-Çanakkale Motorway Project (developed by ÇOK A.Ş.) will be reviewed and revised according to the Project Standards, updated and implemented for the Project.

### *Security*

The following measures will be considered as a minimum during the construction phase regarding security arrangements:

- A Security Management Plan will be prepared in line with the national (Private Security Services Law No: 5188, 2004) and international (e.g., IFC PS4) standards within the scope of the Project to manage the security-related impacts and ensure the security of the activities, assets, work premises at the Project and avoid potential impacts on workers and the local community.
- Transport Control and Site Access Procedure of the Malkara-Çanakkale Motorway Project (developed by ÇOK A.Ş.) will be reviewed and revised according to the Project Standards, updated, and implemented for the Project.
- Code of Conduct (for employees and if needed for contractors) and Security Management Plan will be developed and implemented for the Project.
- The Project will make an agreement with a private security company to provide unarmed, trained security personnel. Details of the security team and their contact numbers will be included in the Security Management Plan.
- Security officers must respect and preserve human dignity, as well as maintain and uphold all people's human rights,
- Security officers will remember that they should only provide preventative and defensive services, always exercising restraint and caution and prioritizing the prevention of injuries or fatalities and the peaceful resolution of conflicts,
- Security guards with no criminal histories or history of abuse will be recruited at the campsites and construction sites,
- Security personnel will receive conflict resolution and cultural awareness, code of conduct trainings,
- Security personnel are required to respect the right of local communities to associate, assemble, and speak out in opposition to the Project,
- Security personnel shall at all times fulfil the duty imposed upon them by EPC Contractor, by serving the Project and protecting the community and all persons against illegal acts, consistent with the high degree of responsibility required by their profession and Code of Conduct.
- Security personnel have no law-enforcement authority and will not encroach on public security forces' duties and responsibilities,
- Security personnel may use force only as a matter of last resort and only for preventive and defensive purposes in proportion to the nature and extent of the threat and in a manner that respects human rights, National principles of proportionality are to be respected in interpreting this provision. The arbitrary or abusive use of force is prohibited. The use of physical force, at any time, should be reported to ÇOK A.Ş. to enable the appropriateness of the action to be investigated,
- The use of firearms by security personnel is prohibited at all times,
- Security personnel shall not commit any act of corruption. They shall also rigorously oppose and combat all such acts. While the definition of corruption must be subject to national law, it should be understood to encompass the commission or omission of an act in the performance of or in connection with one's duties in response to gifts, promises, or incentives demanded or accepted, or the wrongful receipt of these once the act has been committed or omitted,
- Security personnel shall respect the law and the Code of Conduct. They shall also, to the best of their capability, prevent and rigorously oppose any violations of them. Security personnel who have reason to

believe that a violation of the present Code has occurred or is about to occur shall report the matter to their superior authorities and, where necessary, to other appropriate authorities,

- Security patrols will be done at regular intervals,
- Entry of unauthorized persons will be prevented by using appropriate tools and gadgets. Warning signs about unauthorized entry will be available at various locations at the Project crossings,
- Entry and removal of equipment/material will be controlled at the control points; the movement of equipment/material will be allowed after the approval of the relevant department,
- A grievance mechanism will be in place for the affected communities to express their concerns about the security arrangements and acts of the security personnel,
- During the operation phase of the Project, security aspects will be reconsidered based on the type of transportation, i.e., passenger or freight. For example, during the storage and transport of hazardous materials on the motorway, a hazardous material security awareness program will be implemented, which may include provisions for personnel security, prevention of unauthorized access, and measures to reduce risks,
- To ensure the visitors' safety and health in the Project during the construction phase, relevant Project officials will continuously accompany the visitors during their stay on the Project Site, and all visitors will be recorded,
- All visitors will be given brochures explaining the Project Area, site rules and what to do in case of emergencies,
- PPE will be provided to visitors coming to the site under the PPE needs at the visited areas,
- All areas that may be dangerous to visitors (waste sites, generators) will be locked,
- All areas that pose a danger at the construction areas will be marked with appropriate signs.

### *Infrastructure and Equipment Design and Safety*

The design and construction of motorway service facilities and engineering structures and the production of superstructure, electrification, signalling and telecommunication, testing and commissioning in the Project will be conducted in line with the Technical Specifications specified in the Construction Contract.

Several structures will be developed as part of the proposed motorway (culverts, overpasses etc) and these will all be designed according to Turkish and international design standards requiring specific structural characteristics related to slopes of cuts and fills, footing sizes and many other considerations.

Detailed investigations will be conducted for assessing the stability conditions for the structural elements for both normal operation loads and under seismic loads. Türkiye Building Earthquake Regulation requires certain parameters to be determined prior to the construction. These parameters were determined by the geological and geotechnical investigations of the Project Area.

### *Transport of Dangerous Goods*

A Hazardous Materials Management Plan will be developed and implemented for the Project to ensure hazardous materials are properly transported, stored and used throughout the Project lifecycle in line with the Regulation on the Transportation of Dangerous Materials on Motorways and international standards. Following points will be implemented as a minimum for the management of transportation of dangerous goods during construction and operation phases:

- Appropriate legally required control measures and certifications will be ensured for all transportation of dangerous materials on motorways ensuring that occupational safety, environmental safety standards are complied with.
- Appropriate legally required screening and acceptance procedure will be implemented for the motorway transportation of bulk or packages representing a potential risk of release to the environment in the event of accidents.
- Emergency Response Plan will be developed and implemented for the Project and will include spill prevention and control measures, g., routing and timing of hazardous materials transport to minimize risk to the community (e.g. restricting transport of hazardous materials on some routes), construction of protective barriers and other technical measures (e.g. drainage / receptacle provisions) at sensitive locations (e.g. water resources and settlements) and disclosure of emergency preparedness and response information to the potentially affected communities.
- A **Hazardous Material Security Awareness Program** will be implemented. This program will include measures such as personnel training for secure handling, access control to prevent unauthorized entry, and protocols to reduce transport risks.

The impacts related to hazardous materials are assessed in Chapter 7.1 of the ESIA in detail.

***Blasting***

The mitigation measures listed below will be implemented especially for the blasting activities during the construction phase.

- All blasting activities which will be carried out in Muratlı, Osmanlı, Tepeköy, Dereköy and 68+000 Quarries, with current pattern, will be carried out at least 298 m away from receptors/settlements. If blasting activities will be carried out at a location closer than this distance, blasting pattern and explosive quantities will be optimized to be in line with the vibration effect as below the 5 mm/s at the sensitive receptors.
- Proper and timely communication and information exchange between the Client/Contractor and residents, are essential to prevent unnecessary concerns. Therefore, residents will be informed about the proposed blasting times and/or any deviation from this programme.
- Construction and blasting activities will be scheduled to minimise potential vibration related impacts.
- During the blasting activities, vibration measurement studies will be performed for frequency ranges on the closest receptors to the blasting locations. Within this regard, the nearest receptors to the blasting locations will be identified at the site prior to the blasting activities.
- Baseline surveys of existing building structure and integrity at receptors close to the blasting sites will be undertaken so that impacts and any damage arising from blasting activities will be identified during the periodic monitoring studies.
- Maintenance of the motorway will be carried out regularly to reduce the roughness of running surfaces, so the vibration levels are minimized.

#### 7.3.1.4.3 Residual Impacts

##### *7.3.1.4.3.1 Construction Phase*

The duration of the impact factors of the component is long term and frequency changes from infrequent to continuous. Geographic extent is local for all impact factor except the transport of dangerous goods which is regional. The intensity varies from low to high based on the nature of the impact factor same as the reversibility

which changes from short term to long term. The component sensitivity is assessed as medium low to medium high. The impact on the community health and safety is expected to negligible and low after the implementation of the mitigation measures.

The residual impact on community health and safety component after the application of the abovementioned mitigation measures during the construction phase is presented in Table 284.

**Table 284: Residual Impact Assessment Matrix for Community Health and Safety during Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Traffic and pedestrian safety | Duration: | Long | Medium high | Short-mid-term | **Medium** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Community exposure to diseases | Duration: | Long | Medium-low | Short-mid-term | **Low** | Medium high | **Negligible** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Security | Duration: | Long | Medium | Mid term | **Medium** | High | **Negligible** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Infrastructure and equipment design | Duration: | Long | Medium | Long term | **High** | High | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Transport of dangerous goods | Duration: | Long | Medium | Mid term | **Medium** | Medium high | **Low** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | High | | | | | |
| Blasting | Duration: | Long | Medium | Short-term | **Negligible** | Medium high | **Negligible** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Noise | Duration: | Long | Medium | Long term | **High** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Vibration | Duration: | Long | Medium | Short-mid-term | **Low** | Medium high | **Negligible** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

#### 7.3.1.4.3.2 Operation Phase

No blasting activities will occur during the operation phase of the Project.

Increased road traffic around the motorway service facilities and connected settlements are expected for the operation phase of the Project. Vehicle and pedestrian safety concerns, including motorway crossings, have also been thoroughly assessed, and mitigation measures have been formulated to address these risks. The duration of the impact factor is very long term, and frequency is assessed as continuous. Geographic extent is local, and the intensity is medium. The component sensitivity is assessed as medium, and the reversibility is long term. The impact on the community health and safety is expected to low after the implementation of the mitigation measures.

Positive impact will also be expected on community health and safety during operation phase since the motorway will reduce the travel time and will be an increase in road safety as it allows travel on separated roads which will be built with new technologies with increased safety. The duration of the improved road safety and shortened travel time impact factor is very long term and frequency is assessed as continuous. Geographic extent is regional, and the intensity is medium. The component sensitivity is assessed as medium, and the reversibility is long term.

The residual impacts on community health and safety component after the application of the abovementioned mitigation measures during the operation phase are presented in Table 285 and Table 286.

**Table 285: Residual Impact Assessment Matrix for Community Health and Safety during Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Increased road traffic around the motorway service facilities and connected settlements | Duration: | Very long | Medium | Long term | **High** | Medium high | **Low** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |
| Safety risks associated with the motorway crossings | Duration: | Very long | Medium | Long term | **High** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Medium | | | | | |
| Traffic and pedestrian safety | Duration: | Very long | Medium-high | Mid term | **High** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Medium | | | | | |
| Noise | Duration: | Very long | Medium | Short-mid-term | **Medium** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Low | | | | | |
| Security | Duration: | Very long | Medium | Short-mid-term | **Low** | Medium high | **Negligible** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Low | | | | | |

**Table 286: Residual Impact Assessment Matrix for Community Health and Safety during Operation Phase (positive)**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Improved road safety and shortened travel time | Duration: | Very long | Medium | Long term | **High** | Medium-low | **High** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | Regional | | | | | |
| | Intensity: | Medium | | | | | |

#### *7.3.1.4.3.3 Decommissioning and Closure Phase*

In order to prevent impacts, Project Site should be effectively and permanently blocked from all access to the public until the site can be converted into a new beneficial land use based on changed conditions at the site.

### 7.3.1.4.4 Monitoring

Monitoring measures will be systematically implemented to assess various impact factors and ensure the effective management of risks related to community health and safety throughout the Project. The monitoring process encompasses:

- Keeping a record of the number of traffic-related incidents involving contractor workers, subcontractor workers and external persons,
- Tracking and investigating accident and incident reports involving the community throughout the construction and operation phases.
- Keeping a record of the number of total road closures caused by Project activities,
- Reviewing the implementation of safety measures such as signage, barriers, and reflective markers,
- Regularly checking construction traffic routes for impacts on vulnerable areas like schools or hospitals,
- Keeping a record of the number of grievances received and the percentage of grievances resolved positively,
- Inspecting pedestrian crossings, overpasses, and underpasses for safety and maintenance needs,
- Conducting routine checks on visibility, lighting, and structural integrity, particularly after severe weather,
- Monitoring health screenings and hygiene facilities to prevent disease transmission,
- Conducting regular reviews of the Security Management Plan to ensure security personnel are following the code of conduct,
- Monitoring security patrols, preventing unauthorized access, and addressing community security concerns,
- Tracking and reporting any use of force by security personnel, ensuring adherence to human rights principles,
- Monitoring hazardous materials transportation to ensure compliance with legal and safety standards,
- Tracking emergency response actions related to spills or accidents, ensuring proper containment and communication with local communities,
- Keeping a record of stakeholder engagements,

- Keeping a record of and tracking the traffic accident/emergency response actions,
- Keeping a record of and tracking Training Records of Drivers,
- Training records on community health and safety,
- Records of communicable diseases,
- Air and noise measurements,
- Environment-related grievances and the actions taken,
- Training record to the security personnel,
- Keeping a record of the Project maintenance and components malfunctions.

#### 7.3.1.5 Labour and Working Conditions

The Project will comply with a number of international standards and guidelines, including IFC Performance Standard 2: Labour and Working Conditions. This sets out a range of recommendations regarding human resources and working conditions. EPC Contractor and its subcontractors will comply with these requirements when implementing the Project.

The impact assessment of labour and working conditions is considered together for both the construction and operation phases. This is because similar consequences can arise, and the same mitigation measures will be applied for both phases of the Project. The Project will require the involvement of a maximum of 3,300 personnel during the construction phase. The number of employees is expected to be reduced during the operation phase. The average number of workers to be employed is expected to range between 300 and 400 full time equivalents throughout the years, including all contractors during the operation phase.

A project-specific human resources and human rights policy and management system will be established to oversee labour rights, working conditions, worker organizations, child/forced labour, non-discrimination and equal treatment, retrenchment, grievance mechanisms, workers engaged by third parties, security, and health issues for all workers.

The management plans and procedures which will be prepared (at least) for the Project and related to labour issues are as follows:

- Human Resources Management Plan
- Occupational Health and Safety Management Plan
- Stakeholder Engagement Plan and Grievance Mechanism
- Health, Safety, Environmental and Social Training Procedure
- Permit to Work Procedure
- Supply Chain Management Plan
- Subcontractor Management Plan
- Working at Height Procedure
- Off-Site Working Procedure
- Camp Site Management Plan

Specific risks related to labour and working conditions are presented in the following sections.

## Specific risks related to labour and working conditions

### Terms of employment

Working conditions and terms of employment (e.g., wages and benefits, wage deductions, working hours, overtime pay, breaks, rest days, and leave for illness, maternity, vacation, or holidays) are governed by national labour laws and regulations (specifically, the Labor Code numbered 4857) and collective bargaining agreements with workers' organizations (if any).

In most cases, the risks associated with employment are directly related to the fact that employees are not fully aware of their rights and that their rights are not communicated to them by the employer, both in training sessions and in the written employment contract. When working conditions and terms of employment are not clearly documented and communicated to employees and contractors, the chances of employees challenging the negative behaviour to which they are subjected are reduced, both legally and ethically.

If an employee does not have an employment contract with clearly defined terms and conditions of employment, they may face the following risks:

- Salary and job insecurity
- Risk of unfair dismissal
- Risk of salary delays and non-payment
- Risk of not being registered in the social security system (Social Insurance Institution (SSK)
- Loss of benefits such as severance payment
- Labour exploitation, including forced labour, child labour, and unfair wages or working hours
- Risk of discrimination, harassment, or unfair treatment based on factors such as gender, race, ethnicity, religion or nationality.

### Working Conditions (Including Working and Rest Time, as well as Overtime Management)

Ensuring fair working conditions, managing working hours, rest periods, and overtime for employees is essential to ensure compliance with Project standards and to prevent worker fatigue and related safety risks. Poor management in these areas can lead to:

- Excessive working hours without sufficient rest,
- Increased risk of work-related injuries and accidents,
- Fatigue-related productivity loss,
- Potential legal liabilities for non-compliance with labour regulations, and;
- Overall negative impact on employee health and well-being.

### Risks associated with Occupational Health and Safety

An Occupational Health and Safety (OHS) hazard is defined is defined as a potential source of harm or damage that exists in the workplace or can come from outside and affect the worker, the workplace or the environment. Risk is defined as the chance or probability that a person will be harmed or suffer adverse health effects if exposed to a hazard.

Construction work is among the high-risk occupations in terms of OHS. The hazards to which workers may be exposed as part of these jobs include, at a minimum, those listed below.

| Construction Phase OHS issues | Operation Phase OHS issues |
|---|---|
| ■ Working at height<br>■ Hot works<br>■ Lifting operations<br>■ Suspended loads<br>■ Working in confined spaces<br>■ Working in remote locations<br>■ Excavation and ground works<br>■ Working with hazardous materials<br>■ Hazardous Atmosphere<br>■ Manual handling<br>■ Working with hand tools<br>■ Working around heavy vehicles<br>■ Site traffic and mobile plant<br>■ Occupational illnesses<br>■ Electrical hazards<br>■ Heat stress<br>■ Slip, trips<br>■ Noise and vibration exposure<br>■ Lone or remote work<br>■ Road transport<br>■ Emergency response<br>■ Weather<br>■ Security<br>■ Infectious diseases<br>■ Storage of hazardous materials such as fuels and chemicals | ■ Driving<br>■ Road transport<br>■ Vehicle traffic accidents<br>■ Fatigue<br>■ Electrical hazards and magnetic fields<br>■ Maintenance works (which may include physical, chemical, biological hazards, also confined space entry)<br>■ Occupational illnesses<br>■ Malfunction/collapse of structural elements impacting workers/public<br>■ Emergency response<br>■ Weather<br>■ Security |

### *Unionisation and Collective Bargaining*

Supporting unionisation and collective bargaining is essential to protect employee rights and promote fair treatment.

In Türkiye, unionisation faces significant restrictions due to legal and practical barriers that limit workers' rights to organize and collectively bargain. High representation thresholds make it difficult for smaller unions to represent workers, and certain sectors have limited opportunities for union activity. Although anti-retaliation laws exist in Türkiye, enforcement is weak, so workers often fear losing their jobs if they try to unionize. The government also has the power to intervene in strikes. Additionally, many workers have temporary or insecure jobs, making them less likely to join unions.

Hence, potential risks of inadequate practices in these areas include:

- Limited worker representation, resulting in insufficient support for employees' needs,
- Restricted negotiation power, leading to unfair wages and benefits,
- Increased risk of labour disputes and strikes, and,

- Employee dissatisfaction and turnover due to limited rights to organize and negotiate.

### *Informal, Child, and Forced Labour*

Informal, child, and forced labour present serious ethical, legal, and reputational risks. Potential issues linked to these practices include:

- Exploitation of vulnerable individuals, particularly children and unregulated workers,
- Unsafe working conditions and absence of formal protections,
- Exposure to penalties, sanctions, and reputational damage, and
- Negative social impact, including harm to relationships with local communities.

### *Gender Issues in Labour Management*

Addressing gender issues is essential for creating a fair and inclusive workplace and following best practices for the Project. Inadequate gender management may result in non-compliance with international standards, such as the ILO Convention No. 111 on Discrimination (Employment and Occupation). Potential risks associated with inadequate management of gender issues include:

- Gender-based discrimination in hiring, wages, and promotions,
- Limited opportunities for women in certain roles or decision-making positions, and,
- Risks of harassment and unequal treatment.

### *Risks associated with migrant workers*

Hiring a migrant workforce can involve certain risks related to worker rights, legal compliance, and potential social impacts. The large majority of migrant workers are less-skilled workers, who are more frequently exposed to decent work deficits, including poor OHS conditions, and are more likely to be in irregular status, meaning work is occasional. Migrant workers may be at high risk of exposure to workplace hazards and face additional work-related risk factors and adverse social determinants of health (ILO, 2020), including:

- Employment and wage discrimination,
- Poor working and living conditions,
- Lack of access to social protection; and
- Language and cultural barriers.

### *Labour influx*

A large influx of workers to the Project site can strain local resources and have significant impacts on both the workforce and the nearest settlements. Potential risks associated with labor influx include:

- Pressure on housing, health services, and infrastructure in the nearest settlements,
- Poor working and living conditions due to overcrowding and insufficient services, and,
- Social tension between workers and the local communities, causing conflicts.

Managing these risks is essential to prevent negative impacts on both the Project workers and the local communities.

### *Risks associated with accommodation facilities*

The main risks related to the accommodation places / camp sites in term of OHS are listed (not limited to) below:

- Security problems
- Emergencies (fire safety etc.)
- Communicable and viral diseases and illness
- Infrastructure, building, and equipment design related risks (Public Assess to Camp site)

#### 7.3.1.5.1 Impact Analysis

The social component Labour and Working Conditions was assigned a high value of sensitivity which may cause direct and negative consequences if not managed properly.

##### *7.3.1.5.1.1 Construction Phase*

Labour and working conditions related risks are associated with mainly all Project construction activities during the construction phase. The labour and working conditions impacts might be related to the factors such as the overall working environment, terms of employment, working hours, non-discrimination and equal opportunity, child, forced and migrant labour in construction works, workers' accommodations and adherence to occupational health and safety standards.

##### *7.3.1.5.1.2 Operation Phase*

Similar to the construction phase, labour and working conditions related risks during the operation phase are associated with the operation activities (routine and non-routine operations) of the Project. During the operation phase, it is anticipated that the same impact factors experienced during the construction phase will be observed, with reduced intensity due to significant decrease in the number of employees. Additionally, the Project will result in workforce retrenchment during the transition to the operation phase, and upon the completion of the construction phase.

##### *7.3.1.5.1.3 Decommissioning Phase*

Since this is a motorway Project, no decommissioning phase is anticipated, and therefore a new impact is not expected during the decommissioning phase of the Project.

#### 7.3.1.5.2 Mitigation Measures

Mitigation measures for addressing the impacts associated with labour and working conditions are crucial for preventing and reducing the impacts due to the Project. Mitigation measures have been identified for the potential impacts during the construction, and these measures are deemed applicable throughout all phases of the Project, while also encompassing considerations for retrenchment during the operation phase.

- The Client will develop and implement a Labour Management Plan and Human Resources Policy in line with IFC PS-2. These will ensure compliance with wage standards, regulate working hours, respect freedom of association and promote employee development including local workforce. The HR Policy will also strictly prohibit the use of child and forced labour, discrimination based on religion, language, gender or social status, and bullying and harassment.
- As part of the annual labour audit, an assessment should be made to determine whether the current labour management staff is adequate and if additional resources are needed.
- The ILO standards ratified by Türkiye will be applied.

**Terms of employment and working conditions**

- Employees will be provided with information including, but not limited to, entitlements to wages, hours of work, overtime arrangements and overtime pay, and any benefits (such as sick leave, maternity/paternity leave, or vacation).
- All employees will have an employment contract (permanent or temporary) and a copy of the signed contract will be provided to employees. Contracts will include at least the following information:
  - Date of contract (date signed)
  - Full names and details of the parties
  - Fee and date of payment
  - Job description
  - Duration (fixed or indefinite)
  - Rights and duties of the parties
  - Working hours
  - Conditions of termination
- Contracts will be explained verbally to all employees where necessary to ensure that employees understand their rights prior to signing any employment contract.
- Wages, benefits and working conditions offered will be comparable to those offered by similar employers in İstanbul and Tekirdağ and in the same sector.
- Recruitment processes will be transparent, public and non-discriminatory, providing equal opportunities with respect to ethnicity, religion, language, gender and sexual orientation. Priority will be given to the recruitment of skilled, semi-skilled and unskilled workers from the settlements in the AoI.
- All employees (including employees of subcontractors) must be registered with the Social Insurance Institution (SSK) before starting work on the project.
- The Project will not cause retrenchment of existing personnel, but collective dismissal of the construction personnel will be required, after the completion of the construction phase. However, contract of limited duration will be used, and the workers will be informed on the duration of their work.
- It should be noted here that; retrenchment of the construction workforce following the completion of construction activities will also be done in compliance with Turkish Labour Law; subordinated regulations and contractual requirements.
- The Client will adhere to national labour laws and IFC PS 2 requirements to ensure that all workers have reasonable working hours, with appropriate rest periods and limitations on overtime. Türkiye defines working hours as maximum 45 hours per week. Client requires all sub-contractors to monitor excessive overtime i.e., workers' hours exceeding national regulations on working time. All employees must be entitled to a 1-hour rest breaks during the daily working hours. EPC Contractor and sub-contractors should seek to avoid night-time work without prior agreement of the Project.
- Working hours and overtime will be clearly documented and monitored to prevent excessive working hours. Any overtime will be voluntary, compensated at a fair rate, and within legal limits. Contractors and subcontractors will also be required to comply with these standards, with regular monitoring to ensure alignment across all parties involved in the Project.

- EPC Contractor and its sub-contractors are required to implement a system whereby wages shall be paid in legal tender at regular intervals. Payroll records of the direct and indirect workers will be controlled by EPC Contractor strictly. All workers will be paid equal for equal jobs.
- Social insurance payments of all direct and indirect workers will be strictly controlled by Client. If required awareness meetings will be held with the Project workers. The Client will conduct independent audits and inspections.
- The Client will be responsible for monitoring contractors and supply chain companies.

**Workers' accommodations and labour influx**

- A Project-specific Camp Site Management Plan in accordance with the IFC/EBRD Guidance Note on Workers' Accommodation (2009) must be developed and implemented. Risks and mitigations regarding labour influx due to the Project workforce must be included in the relevant management plans.
- Camp sites will be sited and designed so as not to be affected by the environmental or operational impacts of the construction site (e.g. noise, dust emissions), but sufficiently close that workers do not have to spend excessive time traveling from their accommodation to the construction site. If the site is not within walking distance, transportation will be provided to and from the site.
- Workers' accommodation will be clean and safe and will meet the basic needs of workers, providing a minimum of space for each worker; sanitary, laundry and cooking facilities. Overcrowding will be avoided.
- Heating, air conditioning and ventilation will be appropriate to climatic conditions and will provide workers with a comfortable and healthy environment in which to rest and spend their leisure time.
- Drinking water to be provided to Project workers and water for food preparation, washing and bathing areas will meet the requirements of the Turkish Regulation on Water Intended for Human Consumption.
- Adequate toilet facilities (toilets, urinals, washbasins and showers) will be provided for the number of people expected to work at the facility, and provisions will be made to indicate whether the toilet facility is "in use" or "vacant." Toilet facilities shall also be provided with an adequate supply of hot and cold running water, soap and hand drying facilities.
- Rooms and dormitory facilities shall be designed and constructed to provide workers with adequate rest and to maintain good standards of hygiene.
- First aid and medical facilities, as well as provisions for safety against potential hazards (fire, etc.) will be provided at camp sites.
- Domestic wastewater and waste generated at the campsites will be properly managed and disposed of in accordance with the requirements of the Waste Management Plan.
- Workers accommodated in the camps will be made aware of all rules governing the accommodation.
- A security management plan will be developed and will also cover the requirements of the camp site, and the security of the workers and their property (personal belongings) will be ensured on site.
- Entry/exit to the campsites will be restricted under all possible circumstances and will be done through a designated gate with security personnel.
- Security personnel will conduct routine checks at the construction site.
- Security cameras will be present at the campsites (where applicable).

- Pre-employment and periodic health screenings of employees will be conducted in compliance with legal requirements to ensure the health and safety of the workforce.
- An occupational health physician will be appointed for the Project in accordance with legislation, and if possible, one occupational health physician or other healthcare staff will be present at each camp site.
- Regular training sessions on health-related matters will be provided to workers by the occupational health physician.
- Hygienic facilities, such as toilets, showers, and washbasins, will be adequately provided for workers, and these facilities will be cleaned regularly to maintain sanitary conditions.
- Disinfection of camp sites will be regularly conducted to ensure hygiene and prevent the spread of diseases.

**OHS**

- A Project-specific HSE Policy and Occupational Health and Safety Management Plan will be established to provide a safe environment for employees, including subcontractors, visitors and community members, and to protect the environment and assets.
- Site-specific emergency response plans and risk assessments will be prepared.
- Labor Law No. 4857 and Occupational Health and Safety Law No. 6331 and relevant regulations and international standards (e.g. IFC PS2) will be applied throughout the Project.
- Construction phase activities will comply with the requirements of the Regulation on Health and Safety at Construction Sites.

**Migrant workers**

In case of employment of migrant labour within the Project:

- Compliance will be ensured with IFC PS-2 and Article 13 of the Implementation Regulation of the Law on Work Permits of Foreigners, which remains in force pursuant to the fourth paragraph of the Provisional Article 1 of Law No. 6735 on International Workforce.
- It will be ensured that the migrant workers are employed under terms and conditions that are substantially equivalent to those of other workers performing similar tasks (such as leave entitlements, wages, etc.),
- Actions will be taken to address and resolve any language barriers that may arise with migrant workers to ensure open and effective communication,
- OHS practices will be planned and implemented in multiple languages (as needed), and the local language of migrant workers will be used for information posted on the HSE information boards at the Project site and camp site, is required.

**Informal, child and forced labour**

- Forced labour will be prohibited by ensuring full compliance with national legislation and the provisions of relevant conventions and other international standards. These measures will be reflected in the Project's relevant plans and policies such as Employment Policy Document, Human Resources Policy and Human Rights Management Plan.
- EPC Contractor will enforce minimum age expectations (aged at least 18 years and above) and maintain records that this has been checked.

- Regular audits will be conducted to assess contractor compliance with policies on child and forced labour, and corrective actions will be taken if non-compliance is identified.
- Contractors will be monitored on their performance related to human rights risks, such as prohibition of forced and child labour.
- The Client will require all contractors and suppliers in the supply chain to comply with national and international standards against informal, child, and forced labour.
- Supplier contracts will include requirements for fair labour practices.
- Monitoring mechanisms will be established to track supplier adherence to labour standards, and corrective actions will be enforced for any non-compliant suppliers.

**Unionisation and collective bargaining**

- All workers will have the freedom to join an association and union in accordance with Turkish labour law. The Client will ensure that workers are aware of their rights to join local trade unions.
- Non-retaliation measures will be implemented to protect employees from any adverse action due to union activities, promoting a safe environment for exercising collective bargaining rights.
- Worker's representatives will be elected to give workers a clear way to share their concerns and discuss working conditions.

Regular meetings between management and worker representatives will be conducted to help address any issues and support good working relations.

**Gender issues**

- The Client will comply with Turkish law and will apply equal opportunities to women in all other areas where the law does not prohibit female workers. Further measures will remain and non-discrimination and put in place to encourage female participation in non-employee workforce, such as positive equal opportunity providing specific training where required, enabling flexibility and job-sharing opportunities for women with children to participate.
- A grievance mechanism for workers will be established and implemented, providing a channel for addressing grievances related to labour and working conditions issues including Gender-Based Violence and Harassment (GBVH) at the workplace as well as facilitating anonymous submission of grievances.

The Client will actively monitor and review gender-related policies to ensure they remain effective and aligned with best practices for equal opportunity and fair treatment.

**Grievance Mechanism**

- The Client will implement the grievance mechanism for Project workers as defined in the Project Stakeholder Engagement and Grievance Mechanism Procedure and will oversee its implementation by its subcontractors. The Project grievance mechanism will provide avenues for Project workers to lodge their grievances. The Client will ensure that workers are informed about the grievance mechanism at the time of recruitment and that it is easily accessible to them.
- Grievance forms and boxes will be made available at the Project site. These forms can also be completed anonymously.

- Monitoring and auditing of the employee grievance procedure will be conducted to determine the effectiveness of the procedure and also to identify recurring employee issues. Monitoring and auditing will be conducted on a quarterly basis and/or whenever recurrence occurs three times in a row.

These measures will help protect workers' health and welfare while maintaining high standards for labour practices consistent with IFC PS-2 and Project standards.

#### 7.3.1.5.3 Residual Impacts

The overall residual impact on labour and working conditions will be low when mitigation measures are fully adopted.

##### *7.3.1.5.3.1 Construction Phase*

The impact on labour and working conditions is assessed as negative and the duration of the impact is long. The frequency of impacts is frequent, and the geographical extent is local. The intensity of the component is high, and the sensitivity is medium-high. The impact assessment of the Project changes from medium to low after the implementation of the mitigation measures (Table 287).

**Table 287: Residual Impact Assessment Matrix for Labour and Working Conditions during the Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Labour and working conditions related impacts | Duration: | Long | Medium-high | Short-mid-term | **Medium** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |

##### *7.3.1.5.3.2 Operation Phase*

The impact on labour and working conditions during the operation phase is assessed as negative. Similar to the construction phase, the impact changes from medium to low after the implementation of mitigation Table measures with the duration for the operation phase is being very long and the intensity is low (Table 287).

**Table 288: Residual Impact Assessment Matrix for Labour and Working Conditions during the Operation Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Labour and working conditions related impacts | Duration: | Very long | Medium-high | Short-mid-term | **Medium** | Medium high | **Low** |
| | Frequency: | Frequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |

##### *7.3.1.5.3.3 Decommissioning and Closure Phase*

A new impact is not expected other than those listed in the construction phases in the decommissioning and closure phase of the Project.

#### 7.3.1.5.4 Monitoring

The following monitoring activities will be conducted to ensure the implementation and effectiveness of the proposed mitigation measures:

- Monitor compliance with wage standards, working hours, overtime records, and other HR policy provisions through annual audits,
- Regular assessments of labour practices, including checks on child and forced labour, discrimination, and harassment policies,
- Annual audits to evaluate the adequacy of labour management staffing and determine the need for additional resources,
- Regular monitoring to ensure ILO standards are followed, including verification through independent audits,
- Ensure recruitment processes are transparent and non-discriminatory,
- Track payroll and social insurance records to ensure equal pay for equal work and compliance with Turkish regulations,
- Monitor compliance with national labour laws during retrenchment; ensure that construction phase dismissals are done in accordance with labour regulations,
- Monitor camp site conditions, including cleanliness, safety, and sanitation, ensuring that they meet Project standards,
- Conduct regular health and safety inspections at camp sites and Project site,
- Implement site-specific emergency response drills and risk assessments to ensure compliance with health and safety regulations,
- Regularly check that migrant workers (if any) are treated on par with other workers and address any language barriers,
- Conduct periodic audits to verify compliance with child and forced labour policies, ensuring corrective actions are taken, if necessary,
- Monitor the compliance of contractor and subcontractor practices with the Project standards,
- Monitor the grievance mechanism regularly through audits and ensure workers' grievances are resolved in a timely and transparent manner,
- Continuously review and update gender-related policies and monitor their effectiveness, including the implementation of specific training programs for female participation.

#### *7.3.1.6 Infrastructure, Utilities, and Services*

This section assesses the Project's potential implications on the local infrastructure, utilities, and services. To have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on the issues such as transportation, water infrastructure, electricity and education.

##### *Education*

In this subsection, the potential implications of the Project on issues regarding education in the local area are assessed. In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on education (Table 289).

**Table 289: Impact Anticipations of Residents on Education**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 19 | 22.6 |
| | | No | 65 | 77.4 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 4 | 17.4 |
| | | No | 19 | 82.6 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 2 | 11.8 |
| | | No | 14 | 82.4 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 7 | 13.7 |
| | | No | 44 | 86.3 |
| | | No opinion | 0 | 0 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 6 | 50 |
| | | No | 6 | 50 |
| | | Total | 12 | 100 |

During the interviews with the local people, whether they anticipate any impact on education by the Project was asked. Mostly, the participants anticipate no notable impact on education in all districts. The ones who expect a positive impact think the Project might provide easier access to higher education.

### *Transportation*

In this subsection, the potential implications of the Project on issues regarding transportation in the local area are assessed. In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on transportation (Table 290).

**Table 290: Impact Anticipations of the Residents on Transportation**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 54 | 64.3 |
| | | No | 30 | 35.7 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 14 | 60.9 |
| | | No | 9 | 39.1 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 8 | 47.1 |
| | | No | 8 | 47.1 |

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 39 | 76.5 |
| | | No | 12 | 23.5 |
| | | No opinion | 0 | 0 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 10 | 83.3 |
| | | No | 2 | 16.7 |
| | | Total | 12 | 100 |

In general, the local people anticipate that the Project will positively affect transportation by means of easier access through the motorway, especially in the Malkara district.

### *Water Infrastructure*

In this subsection, the potential implications of the Project on issues regarding water infrastructure in the local area are assessed. In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on water infrastructure (Table 291).

**Table 291: Impact Anticipations of the Residents on Water Infrastructure**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 13 | 15.5 |
| | | No | 68 | 81 |
| | | No opinion | 3 | 3.6 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 4 | 27.4 |
| | | No | 19 | 81.6 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | Yes | 2 | 11.8 |
| | | No | 14 | 82.4 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 7 | 13.7 |
| | | No | 44 | 86.3 |
| | | Total | 51 | 0 |
| | Malkara | Yes | 2 | 16.7 |
| | | No | 10 | 83.3 |
| | | Total | 12 | 100 |

The local people of the settlements do not anticipate any notable impact on the water infrastructure of the local area due to the Project.

### *Electricity*

In this subsection, the potential implications of the Project on issues regarding electricity in the local area are assessed. In order to have a more comprehensive understanding of the potential impacts, the local community were asked about their anticipations about the impacts of the Project on electricity (Table 292).

**Table 292: Impact Anticipations of the Residents on Electricity**

| Province | District | Answer | Frequency | % |
|---|---|---|---|---|
| İstanbul | Silivri | Yes | 14 | 16.7 |
| | | No | 68 | 81 |
| | | No opinion | 2 | 2.3 |
| | | Total | 84 | 100 |
| Tekirdağ | Çorlu | Yes | 2 | 8.7 |
| | | No | 21 | 91.3 |
| | | Total | 23 | 100 |
| | Marmaraereğlisi | No | 16 | 94.1 |
| | | No opinion | 1 | 5.9 |
| | | Total | 17 | 100 |
| | Süleymanpaşa | Yes | 1 | 2 |
| | | No | 50 | 98 |
| | | No opinion | 0 | 0 |
| | | Total | 51 | 100 |
| | Malkara | Yes | 1 | 8.3 |
| | | No | 11 | 91.7 |
| | | Total | 12 | 100 |

The local people of the settlements do not anticipate any notable impact on electricity of the local area due to the Project.

#### 7.3.1.6.1 Impact Analysis

##### *7.3.1.6.1.1 Construction Phase*

Considering the expected population influx and the insufficient infrastructure system in some of the settlements in the AoI identified in the socioeconomic baseline, mitigation measures have been defined to prevent the pressure and negative impact on infrastructure and services caused by the population influx, especially during the construction phase. Certain negative impacts related to the population influx due to the Project on infrastructure and services are as follows:

- The inability of vulnerable groups to equally access social and health services due to supply-demand imbalance,
- Population influx due to the Project intensifying health services and decreasing the quality of service,

- Delays in responding to emergencies on time,
- The emergence of inadequacies due to increased demand for drugs and medical needs.

#### *7.3.1.6.1.2 Operation Phase*

During the operation phase of the Project, the provinces will be connected, and the connected transportation from the districts to the provinces is expected to ease access to health and education services. The Project will provide the local communities access to social, health and educational services, reducing the pressure on motorway transportation.

#### *7.3.1.6.1.3 Decommissioning and Closure Phase*

The Project infrastructure will be removed from the Project Site as much as practicable during the decommissioning phase. This will include transporting such infrastructure from the Project Site, which will likely be done by road.

### 7.3.1.6.2 Mitigation Measures

It is possible to reduce the potential negative impacts emerged from the Project on the infrastructure and services of the AoI if certain mitigation measures are taken, such as:

- An Emergency Response Plan will be prepared and implemented during the construction phase of the Project,
- Community Health, Safety and Security Procedure of the Malkara-Çanakkale Motorway Project (developed by ÇOK A.Ş.) will be reviewed and revised according to the Project Standards, updated and implemented for the Project,
- A traffic management plan will be prepared and implemented for the Project.
- Before the establishment of the construction and the workers' accommodations, an engagement with the local authorities, including the Municipalities, will be held, and energy, transportation and water demand of the Project will be shared,
- Workers’ accommodation will provide health services to the Project workers to not create pressure on the health services of the local communities,
- At minimum first aid and the medical unit will be established,
- District or province government hospitals will be used when required,
- In case of damage to the local infrastructure, including but not limited to telecommunication, electricity, road and water sources, immediate maintenance will be applied,
- A Project-specific Grievance Mechanism will be used to record, avoid, and solve the incident caused by the Project on the local infrastructure.

### 7.3.1.6.3 Residual Impacts

#### *7.3.1.6.3.1 Construction Phase*

The impacts regarding the infrastructure during the construction phase is observed to be negative and local (geographic extent). All the potential impact factors except damage on road transportation may have medium-high receptor sensitivity. The duration is long, and the frequency of the impact factors assessed as infrequent except damage on road transportation which could be recurrent. The intensity of the impact factors varies between medium and medium-high and reversibly varies between short-mid-term and mid-term. The overall extent of the infrastructure related impact factors is expected to be negligible and low.

The residual impact on infrastructure, utilities, and services component after the application of the mitigation measures during the construction phase is presented in Table 293.

**Table 293: Residual Impact Assessment Matrix for Infrastructure and Service during the Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Access to education services | Duration: | Long | Medium-high | Short-mid-term | **Medium** | Medium high | **Negligible** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Access to health services | Duration: | Long | Medium-high | Short-mid-term | **Medium** | Medium high | **Negligible** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Low | | | | | |
| Damage on road transportation | Duration: | Long | Medium | Mid term | **Medium** | Medium high | **Low** |
| | Frequency: | Recurrent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | High | | | | | |
| Access to water sources | Duration: | Long | Medium-high | Short-mid-term | **Medium** | Medium high | **Low** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

#### *7.3.1.6.3.2 Operation Phase*

The Project will provide very long-term accessibility to several provinces in the region. Beyond the local level, better accessibility to social, health and educational services will be provided. With the usage of the motorway travel time will also be expected to be reduced. The overall positive impact related to infrastructure, utilities, and services component is expected to be very high.

The residual positive impact on infrastructure, utilities, and services during the operation phase is presented in Table 294.

**Table 294: Residual Impact Assessment Matrix for Infrastructure and Service during the Operation Phase (positive)**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Transportation | Duration: | Very long | Medium-high | Long term | **Very High** | High | **Very High** |
| | Frequency: | Continuous | | | | | |
| | Geo. Extent: | National | | | | | |
| | Intensity: | High | | | | | |

#### *7.3.1.6.3.3 Decommissioning and Closure Phase*

A new impact is not expected other than those listed in the construction and operation phases in the decommissioning and closure phase of the Project.

#### 7.3.1.6.4 Monitoring

The effectiveness of the mitigation measures will be continuously monitored throughout both the construction and operation phases. This monitoring will be achieved through the following records:

- Implementation of relevant management plans,
- Tracking traffic-related incidents involving contractor workers, subcontractor workers, and external individuals,
- Documenting instances of full road closures attributed to Project activities,
- Maintaining records of grievances received from external stakeholders regarding access to education and health, along with the percentage of grievances resolved positively,
- Documenting emergency response actions taken,
- Monitoring the usage of water resources that impact local communities,
- Recording community feedback and satisfaction levels through surveys or engagement sessions.

The comprehensive monitoring approach outlined above will provide valuable insights into the effectiveness of mitigation measures and ensure timely adjustments or improvements as needed, fostering sustainable project management practices.

### *7.3.1.7 Gender Assessment*

In this section, the potential implications of the Project on gender relations and gender equality in the AoI are assessed.

#### 7.3.1.7.1 Impact Analysis

During the interviews, the researchers made sure to elaborate on the potential impacts of the Project on women's lives; for example, the Project might affect a private road or place used only by women to gather. One limitation at this point is that the interviews were mainly conducted with men, which prevents understanding women's own experiences through their own voices.

#### *Women's Employment*

One of the crucial issues for gender equality in the AoI is women's secondary position in the economy and employment. Hence, it is crucial to ensure that Project provides equal employment opportunities for both women and men. Whether the Project would positively impact women's employment by offering job opportunities was questioned locally.

##### *7.3.1.7.1.1 Construction Phase*

Based on the household surveys and observations during the social field study, it is anticipated that during the construction phase of the Project, gender inequalities may occur in the AoI that include:

- Risks on the health and safety of the women particularly considering the possibility of limited access to health care, especially for the unpaid agricultural family workers,
- Lack of access to compensation (According to Expropriation Law, the compensation payments will be through direct landowners. However, as men are regarded as the household heads in the patriarchal structure, women do not have direct access to financial issues as precarious unpaid family workers.)
- With the lower educational levels and available skills of women compared to men, the women members of the local communities may not get the equal employment opportunities that emerged from the Project.

According to the baseline studies, the number of female-headed households are higher in the following neighbourhoods: Değirmenköy Fevzipaşa, Yolçatı, Çanta Sancaktepe, Çanta Balaban, Danamandıra in Silivri; Seymen, Şahpaz, Türkgücü, Yenice in Çorlu; Yakuplu and Çeşmeli in Marmaraereğlisi; Köseilyas, Husunlu, Yağcı, Nusratfakı, Mahramlı in Süleymanpaşa; Dereköy, Yenice, Hereke and Ahievren in Malkara. These areas will receive special attention to address gender-based risks and implement targeted mitigation and enhancement measures.

#### *7.3.1.7.1.2 Operation Phase*

During the operation phase of the Project, gender-based violence risks may increase. In order to prevent gender-based violence, mitigation measures will be taken by the Project. Also, gender inequalities based on employment opportunities anticipated in the construction phase of the Project may be relevant for the operation phase. Considering the limited number of workers to be recruited in the operation phase of the Project, it is harder for women to have equal opportunities. The mitigation measures to be taken on women's employment, and procurement will also be taken during the operation phase of the Project in order to promote gender equality in the AoI.

#### *7.3.1.7.1.3 Decommissioning and Closure Phase*

No impact is expected during the decommissioning and closure phase.

### 7.3.1.7.2 Mitigation Measures

Since these inequalities in the existing social structure are at risk of emerging in the activities originating from the Project and in the opportunities offered by the Project, necessary measures will be developed and implemented. In addition to the measures to be taken by the Project, enhancement measures will be implemented to increase women's use of the Project opportunities.

- For the job opportunities and benefits created within the scope of the Project to be equally beneficial, it will be ensured that the vulnerable groups, especially those affected by the Project, and women are informed at a sufficient level,
- Enhancement measures will be developed to increase women's use of the Project opportunities and will be included in the relevant Local Employment Plan to be developed,
- The Project will encourage women to benefit from the employment and local procurement opportunities to be created,
- Women-only stakeholder engagement meetings will be organized to ensure gender equality on the information disclosure process.

The Gender-Based Violence and Harassment Management Plan will be developed and implemented for the Project, or GBVH risks and mitigation measures will be included in other related plans to eliminate the risks of Gender-Based Violence and Harassment that may arise within the scope of the Project. This plan will also be shared with the contractors and full compliance asked from them. This management plan will include and define the following topics:

- Sexual harassment incident referral and reporting plan,
- Notice to employees of the policy against sexual harassment,
- Orientation training on policy against sexual harassment and gender-based violence,
- Monitoring and reporting of employee participation in orientation training,
- Contractor participation in sexual harassment meetings and workshops,

- Zero tolerance policy against violence and harassment,
- Mechanisms for reporting prohibited behaviour, consequences of violations, and suspected violations,
- Female security guards and female CLO employment,
- Planning not to leave dark areas and blind spots in Project Area (especially in motorway service facilities) during the operation and construction process,
- The Minimum Requirements defined above against Sexual Harassment and gender-based violence will be implemented at all Phases of the Project.
- Effective Use of the Grievance Mechanism for these measures is one of the most important tools to detect and prevent risks early. The Project-specific GRM Procedure for the effective use of the grievance mechanism is included in the Project SEP document.
- In parallel with the actions included in this document, support will be provided to ensure that women have access to the Project's GRM.

#### 7.3.1.7.3 Residual Impacts

##### *7.3.1.7.3.1 Construction Phase*

The duration of the impact factor of the component is long and frequency is infrequent. Geographic extent is assessed as local and the intensity is medium. The component sensitivity is assessed as medium high, and the reversibility is mid-term.

The impact assessment of the Project on the gender component changes from medium to low after implementing the abovementioned measures. Therefore, the implementation of both mitigation and enhancement measures is essential in terms of eliminating gender-based Project cause risks. The residual impact on gender issues after the application of the measures during the construction phase presented in Table 295.

**Table 295: Residual Impact Assessment Matrix for Gender Issues during the Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Impact on gender issues | Duration: | Long | Medium-high | Mid term | **Medium** | Medium high | **Low** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

##### *7.3.1.7.3.2 Operation Phase*

A new impact is not expected other than those listed in the construction phase of the Project. However, the security measures to be taken in the operation phase of the Project will prevent and eliminate gender-based risks during the operation phase especially in the motorway service facilities.

##### *7.3.1.7.3.3 Decommissioning and Closure Phase*

A new impact is not expected other than those listed in the construction phases in the decommissioning and closure phase of the Project.

### *7.3.1.8 Vulnerable Groups Assessment*

As defined in the Social Baseline Chapter, vulnerable groups identified within the nearest settlements and considered within the scope of the Project include:

- Illiterate individuals
- People who cannot speak Turkish
- Mobile beekeepers
- Refugees
- Woman headed households
- Households living with social aid
- Children at education age but not involved in education
- Bedridden patients
- Elderly living alone and over 70 years old
- People with physical disabilities
- People with mental disabilities

Vulnerable groups can be affected by the Project impacts differently than others and do not have equal access to the Project opportunities and benefits. There are no vulnerable groups that emerge solely due to the Project; rather, these groups already exist in baseline conditions within the nearest settlements. However, they may be disproportionately affected by Project activities, which is why it is important to include an assessment of vulnerable groups.

The impact of the Project on vulnerable groups and their well-being is assessed in this subsection at the local level.

#### 7.3.1.8.1 Impact Analysis

##### *7.3.1.8.1.1 Construction Phase*

The sources of main potential impacts on the vulnerable groups in the AoI are traffic intensity, infectious diseases, employment opportunities and land acquisition.

Based on the household surveys, observations, and discussions with the local people, it is anticipated that during the construction phase of the Project, the following impacts may occur for the vulnerable groups:

- Restraints on mobility and travel due to construction activities for the older population and people with physical disabilities,
- Lack of participation in the information disclosure activities of the Project (illiterate, migrant, disabled, older adults),
- Insufficient negotiation and misinformation during the land acquisition process (illiterate, older adults),
- Unequal access to employment opportunities,
- Community unrest of the religious minorities.

##### *7.3.1.8.1.2 Operation Phase*

During the operation phase of the Project, similar impacts to the construction phase may occur for the vulnerable groups in the AoI.

#### 7.3.1.8.1.3 Decommissioning and Closure Phase

Decommissioning and the closure phase will require reconstruction works. There might be similar impacts of the construction phase of the Project on the vulnerable groups, such as restraints on mobility, lack of information on the Project and land acquisition process, unequal access to opportunities and social unrest of minorities.

### 7.3.1.8.2 Mitigation Measures

It is possible to reduce the potential negative impacts emerged from the Project on the vulnerable groups of the AoI if certain mitigation measures are taken, such as:

- Access to legal resources with Assistance in case of a need (i.e., transportation) will be provided,
- Assistance in acknowledging and signing official documents will be provided,
- Assistance to access compensation payments will be provided,
- Assistance to find alternative land or house will be provided,
- Assistance to obtain personal documents will be provided,
- Priority will be provided during the recruitment process,
- Travel assistance will be provided when required.

### 7.3.1.8.3 Residual Impacts

#### 7.3.1.8.3.1 Construction Phase

The impacts on the vulnerable groups during the construction phase is observed to be negative and geographic extent is local. The duration of the impact factor of the component is long and frequency is infrequent. The intensity is medium and all of the potential impact factors may cause very high receptor sensitivity due to insufficient infrastructure services in the region. The reversibility is mid-term.

The impact assessment of the Project on the vulnerable groups changes from high to low after implementing the mitigation measures. Therefore, the implementation of both mitigation and enhancement measures is essential in terms of minimizing the impacts and providing support for vulnerable groups. The residual impact on vulnerable groups during the construction phase presented in Table 296.

**Table 296: Residual Impact Assessment Matrix for Impact on Vulnerable Groups during the Construction Phase**

| Impact Factor | Impact Factor Features | | Component Sensitivity | Impact Reversibility | Impact Value | Mitigation effectiveness | Residual impact value |
|---|---|---|---|---|---|---|---|
| Impact on the vulnerable groups | Duration: | Long | Very high | Mid term | **High** | Medium high | **Low** |
| | Frequency: | Infrequent | | | | | |
| | Geo. Extent: | Local | | | | | |
| | Intensity: | Medium | | | | | |

#### 7.3.1.8.3.2 Operation Phase

A new impact is not expected other than those listed in the construction phase of the Project.

#### 7.3.1.8.3.3 Decommissioning and Closure Phase

A new impact is not expected other than those listed in the construction phases in the decommissioning and closure phase of the Project.

### 7.3.1.9 Human Rights Impact Assessment

Human rights are a set of principles and standards which seek to promote fundamental freedoms and human dignity. According to the Office of the United Nations High Commissioner for Human Rights (OHCHR)[231]:

> Human rights are rights inherent to all human beings, whatever our nationality, place of residence, sex, national or ethnic origin, colour, religion, language, or any other status. We are all equally entitled to our human rights without discrimination. These rights are all interrelated, interdependent and indivisible. (para. 1)

A Human Rights Impact Assessment (HRIA) is an instrument for examining policies, legislation and programs to identify and measure their effects on human rights. Their fundamental purpose is to help prevent adverse effects and to maximise positive effects. As such, HRIAs are an indispensable part of making human rights considerations operational in a range of legal and policy contexts.

Project HRIA is prepared as a part of the ESIA to support requirements and Good Industry Practices (GIP) in line with the requirements of Equator Principles IV (dated July 2020). The HRIA is part of the Project's commitment to fulfilling its Corporate Responsibility standards, which include respect for internationally recognised human rights and implementation of the United Nationals (UN) Guiding Principles on Business and Human Rights (2011).

The methodology for the HRIA was developed and refined to ensure that it complements the Environmental and Social Impact Assessment (ESIA) and the Stakeholder Engagement Plan (SEP). The ESIA and SEP cover parallel issues and are the primary studies for impact assessment concerning land and defined social rights.

#### 7.3.1.9.1 Legal Framework for Human Rights

The ESIA provides in-depth legislative framework to be adopted by the Project for all types of activities. This section analyses the national and international requirements (specifically IFC's PSs) within the scope of human rights aspect to be followed throughout the Project lifespan.

As part of the ESIA studies, Project human rights impact assessment was held to identify the mitigation methods for the potential impacts on the local communities and Project direct and indirect workers in compliance with Equator Principles IV, specifically the following clause: "The client is expected to include assessments of potential adverse Human Rights impacts and climate change risks as part of the ESIA or other Assessment, with these included in the Assessment Documentation."

##### 7.3.1.9.1.1 National Requirements

The Constitution of the Republic of Türkiye is the fundamental legal document guaranteeing respect to human rights as stated in Article 2 of Chapter II of the Constitution:

"The Republic of Türkiye is a democratic, secular and social state governed by rule of law, within the notions of public peace, national solidarity and justice, respecting human rights, loyal to the nationalism of Atatürk, and based on the fundamental tenets set forth in the preamble."

The following national legislation and international conventional will be applicable to the Project:

- Constitution of the Republic of Türkiye
- The Law on the Human Rights and Equality Institution of Turkey (TIHEK) (Law No. 6701, 2016)

[231] https://bangkok.ohchr.org/what-are-human-rights/
https://www.ohchr.org/en/human-rights/universal-declaration/

- Labour Law (Law No. 4857, 2003) and related regulations
- Regulation on the Implementation of the Law Concerning Private Security Services
- Labor Act No. 1475, 1971
- Occupational Health and Safety Law No. 6331, 2012
- Social Insurance and Universal Health Insurance Law No. 5510, 2006
- Regulation on Overtime and Extra Hours No. 25425, 2004
- Regulation on the Principles and Procedures Governing the Employment of Children and Young Workers published in gazette No. 25425 (April 2004)
- Law on Trade Unions and Collective Bargaining Agreements No. 6356, 2012

#### *7.3.1.9.1.2 International Requirements*

The following international standards will be applicable to the Project:

- International Labour Organisation (ILO) conventions ratified by Türkiye
- Equator Principles 4 (2020)
- IFC Performance Standards (2012)
- The UN Guiding Principles (UNGPs) on Business and Human Rights by the UN Human Rights Council (2011)
- Guidance Note on Implementation of Human Rights Assessments under EPs (2020)
- IFC Good Practice Note on Managing Contractors' E&S Performance (2017)
- IFC Good Practice Handbook on Use of Security Forces: Assessing and Managing Risks and Impacts (2017)
- IFC/European Bank for Reconstruction and Development (EBRD) Worker's Accommodation: Processes and Standards (2009)
- IFC Handbook for Addressing Project-Induced In-Migration (2009)
- IFC Good Practice Note on Addressing Grievances from Project-Affected Communities (2009)
- IFC Introduction to Health Impact Assessment (2009)
- IFC Stakeholder Engagement Handbook: A Good Practice Handbook for Companies Doing Business in Emerging Markets (2007)
- World Group Bank (WBG) General and Sector Specific Environmental, Health and Safety (EHS) Guidelines (2007)

#### *7.3.1.9.1.3 Cooperation with International Human Rights Mechanisms*

Türkiye has ratified the following international conventions and agreements related to human rights that apply to this Project.

## Council of Europe

Türkiye is currently party to 121 of 225 conventions of the Council of Europe and signed another 31 conventions. Ahead of European Union countries, Türkiye ranks fifteen among all 47 Council of Europe member states.

Apart from the European Court of Human Rights, Türkiye maintains close cooperation with the monitoring and human rights bodies of the Council of Europe covering various areas such as fight against racism and discrimination, prevention of torture and ill-treatment, fight against corruption, money-laundering and terrorism as well as combatting violence against women. In this context, Türkiye maintains its cooperation with the European Committee for the Prevention of Torture (CPT), European Committee Against Racism and Intolerance (ECRI) as well as the Council of Europe Commissioner for Human Rights, while taking into consideration the recommendations and the reports published by these mechanisms.

### *Council of Europe Documents*

- European Convention for the Protection of Human Rights and Fundamental Freedoms (As Amended by Protocol No. 11)
- Council of Europe Convention on the Prevention of Terrorism
- European Convention on the Exercise of Children's Rights
- Protocol No. 4 to the Convention for The Protection of Human Rights and Fundamental Freedoms Securing Certain Rights and Freedoms Other Than Those Already Included in the Convention and in the First Protocol Thereto
- Protocol to the Convention for the Protection of Human Rights and Fundamental Freedoms
- European Social Charter

## Türkiye – European Court of Human Rights (ECtHR) Relations

In 1987, Türkiye accepted the right to individual application to the ECtHR for a review based on the European Convention on Human Rights (ECHR). Türkiye recognized the compulsory jurisdiction of the ECtHR in 1990.

According to Article 90 of Turkish Constitution, international agreements duly put into effect have the force of law and no objection of unconstitutionality shall be raised with regard to these agreements. Moreover, in the case of a conflict between international conventions concerning fundamental rights and freedoms and the laws, due to differences in provisions on the same matter, the provisions of international agreements shall prevail.

Furthermore, the Constitutional Court also stated in its judgment dated 7 February 2008, that the ECHR has become a part of the domestic law within the framework of Article 90 of the Constitution; that the provisions of the Convention have the force of law and that the judgments of the ECtHR are binding.

Therefore, the ECHR and the ECtHR case-law have been acknowledged among the sources of the Turkish legal system.

Furthermore, under the constitutional amendment adopted by the public referendum in 2010, the right to individual application to the Constitutional Court has been introduced. Accordingly, since 23 September 2012, every person may lodge an application to the Constitutional Court on the grounds of allegation of violation by public authority of any of his/her fundamental rights and freedoms safeguarded in the Constitution within the scope of the ECHR.

In accordance with the “Cooperation Protocol” between the Ministry of Justice and the Ministry of Foreign Affairs, that came into force on 1 March 2012, applications arising from domestic law issues and execution of the judgments rendered on these applications are followed by the Ministry of Justice. Applications communicated

to the Government prior to the effective date of the Protocol or applications and execution of judgments related to the foreign policy and international relations of Türkiye are followed by the Ministry of Foreign Affairs.

## UN Human Rights Mechanisms

Türkiye is party to sixteen UN human rights conventions._Compliance with UN conventions by the State parties are reviewed by the relevant committees (treaty-based bodies).

### *United Nations Documents*

- The Statute of The Council of Europe
- Report of The Office of The United Nations High Commissioner for Human Rights on the International Workshop on Enhancing Cooperation Between International and Regional Mechanisms for The Promotion and Protection of Human Rights
- The Role of The Ombudsman, Mediator and Other National Human Rights Institutions in the Promotion and Protection of Human Rights
- International Covenant on Civil and Political Rights
- The Universal Declaration of Human Rights

### *The Human Dimension of the Organization for Security and Co-operation in Europe (OSCE)*

In accordance with the OSCE's comprehensive approach to security, while **ODIHR** works on a wide range of areas such as democracy, the rule of law, human rights and fundamental freedoms, tolerance and non-discrimination, its most visible activity is election observation. ODIHR monitors national elections held in the OSCE participating States upon the invitations of these countries in line with their OSCE commitments. ODIHR deployed an Election Observation Mission to Türkiye to observe the Presidential and 27th Parliamentary Elections held on 24 June 2018.

**The HCNM** was established to identify ethnic tensions involving national minorities, make early warnings and find solutions to conflicts which could undermine stability, peace and friendly relations among states in the OSCE region.

**The Representative on Freedom of the Media** was established to observe media developments in the OSCE region as part of early warning function, ensure the formation of a free, independent and pluralist media and cooperate on these matters.

Actively contributing to the human dimension activities of the OSCE, Türkiye particularly prioritizes the topics of xenophobia, Islamophobia, intolerance and discrimination in the work of OSCE human dimension.

### *The ILO Conventions Ratified by Türkiye*

- C 2 Unemployment Convention, 1919
- C 11 Right of Association (Agriculture) Convention, 1921
- C 14 Weekly Rest (Industry) Convention, 1921
- C 15 Minimum Age (Trimmers and Stokers) Convention, 1921
- C 26 Minimum Wage-Fixing Machinery Convention, 1928
- C 29 Forced Labour Convention, 1930
- C 34 Fee-Charging Employment Agencies Convention, 1933

- C 42 Workmen's Compensation (Occupational Diseases) Convention (Revised), 1934
- C 45 Underground Work (Women) Convention, 1935
- C 53 Officers' Competency Certificates Convention, 1936
- C 55 Shipowners' Liability (Sick and Injured Seamen) Convention, 1936
- C 58 Minimum Age (Sea) Convention (Revised), 1936
- C 59 Minimum Age (Industry) Convention (Revised), 1937
- C 68 Food and Catering (Ships' Crews) Convention, 1946
- C 69 Certification of Ships' Cooks Convention, 1946
- C 73 Medical Examination (Seafarers Convention, 1946
- C 77 Medical Examination of Young Persons (Industry) Convention, 1946
- C 80 Final Articles Revision Convention, 1946
- C 81 Labour Inspection Convention, 1947
- C 87 Freedom of Association and Protection of the Right to Organise Convention, 1948
- C 88 Employment Service Convention, 1948
- C 92 Accommodation of Crews Convention (Revised), 1949
- C 94 Labour Clauses (Public Contracts) Convention, 1949
- C 95 Protection of Wages Convention, 1949
- C 96 Fee-Charging Employment Agencies Convention (Revised), 1949
- C 98 Right to Organise and Collective Bargaining Convention, 1949
- C 99 Minimum Wage Fixing Machinery (Agriculture) Convention, 1951
- C100 Equal Remuneration Convention, 1951
- C102 Social Security (Minimum Standards) Convention, 1952
- C105 Abolition of Forced Labour Convention, 1957
- C108 Seafarers' Identity Documents Convention, 1958
- C111 Discrimination (Employment and Occupation) Convention, 1958
- C115 Radiation Protection Convention, 1960
- C116 Final Articles Revision Convention, 1961
- C118 Equality of Treatment (Social Security Convention, 1962
- C119 Guarding of Machinery Convention, 1963
- C122 Employment Policy Convention, 1964
- C123 Minimum Age (Underground Work) Convention, 1965

- C127 Maximum Weight Convention, 1967
- C133 Accommodation of Crews (Supplementary Provisions) Convention, 1970
- C134 Prevention of Accidents (Seafarers) Convention, 1970
- C135 Workers' Representatives Convention, 1971
- C138 Minimum Age Convention, 1973
- C142 Human Resources Development Convention, 1975
- C144 Tripartite Consultation (International Labour Standards) Convention, 1976
- C146 Seafarers' Annual Leave with Pay Convention, 1976
- C151 Labour Relations (Public Service) Convention, 1978
- C152 Occupational Safety and Health (Dock Work) Convention, 1979
- C153 Hours of Work and Rest Periods (Road Transport) Convention, 1979
- C155 Occupational Safety and Health Convention, 1981
- C158 Termination of Employment Convention, 1982
- C159 Vocational Rehabilitation and Employment (Disabled Persons) Convention, 1983
- C161 Occupational Health Services Convention, 1985
- C164 Health Protection and Medical Care (Seafarers) Convention, 1987
- C166 Repatriation of Seafarers Convention (Revised), 1987
- C167 Safety and Health in Construction Convention, 1988
- C176 Safety and Health in Mines Convention, 1995
- C182 Worst Forms of Child Labour Convention, 1999
- C187 Promotional Framework for Occupational Safety and Health Convention, 2006.

#### 7.3.1.9.2 Human Rights Context of Türkiye

According to Human Rights Watch World Report 2024 (Human Rights Watch), the current human rights issues in Türkiye concerns the following issues:

- Authoritarian Governance
- Freedom of Expression, Association, and Assembly
- Women’s Rights
- LGBT Rights
- Persecution of Human Rights Defenders
- Torture and Ill-Treatment in Custody, Enforced Disappearances
- Kurdish Conflict and Crackdown on Opposition

- Refugees, Asylum Seekers, and Migrants
- Insufficient Climate Change Policy and Impacts
- Earthquake Response (February 2023 earthquakes)

According to another source, Amnesty International (2024), in Türkiye, 2023 was marked by significant human rights challenges. Journalists, activists, and opposition figures were often targeted under stringent anti-terror and disinformation laws, leading to restricted freedom of expression and assembly. The February earthquakes caused extensive damage, displacing millions and disproportionately affecting people with disabilities, who faced inadequate support. Violence against women, LGBTI people, and refugees remained prevalent, further intensified by the election atmosphere. Despite being home to the largest refugee population globally, instances of unlawful deportations were reported. Allegations of torture and ill-treatment by state officials persisted, highlighting issues of accountability. The economic situation deteriorated with rising inflation, though government support programs provided some relief. Environmental concerns were heightened by inadequate responses to climate change and continued dependence on fossil fuels.

#### 7.3.1.9.3 Methodology

The Human Rights impacts of the Project may be various, and they vary according to the context, type, and scale of the Project. The HRIA assesses the potential impacts of the Project on the components that are internationally recognised human rights, including those contained in relevant international standards that Türkiye has ratified, such as the European Convention on Human Rights, the International Bill of Human Rights – meaning the Universal Declaration of Human Rights, the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights and the principles concerning fundamental rights set out in the International Labour Organisation's Declaration on Fundamental Principles and Rights at Work.

In line with the Equator Principles 4 guidance methodology, the overall impact assessment on human rights for the Project is based on the following factors:

- **Scale:** How serious are the impacts for the victim?
- **Scope:** How many people could be affected by the harm?
- **Remediability:** Will a remedy restore the victim to the same or equivalent position before the harm; how easy or difficult would it be for the victim to get a remedy?
- **Likelihood:** What is the likelihood of the impact occurring?

The approach to managing such impacts is based on those most severe (based on scale, scope, and remediability) and with the greatest likelihood of occurring.

The topics addressing potential risks and impacts related to the Project are as follows:

- **Civil and Political Rights**
  - Right to life and security of person
  - Freedom of thought and opinion
  - Right to information
- **Labour Rights**
  - Working conditions and working hours

- Wages
- Non-discrimination
- Right to form and join trade unions and the right to strike
- Right not to be subjected to slavery, servitude or forced labour
- Right to abstain from work
- Right to social security, including social insurance
- Labour standards in supply chain
- Grievance Mechanism

- **Economic, Social and Cultural rights**
  - Right to an adequate standard of living and housing
  - Right to health, food, water and sanitation
  - Right to take part in cultural life
- **Rights of Vulnerable Persons**
  - Migrant workers
  - Right of protection for the children
  - The rights of minorities
  - Women's rights
- **Community Health and Safety**
  - Environmental risks
  - Security risks

The following risk classification in Table 297 is used in the human rights impact assessment for the pre-mitigation conditions. With the implementation of the proposed mitigation measures, the risks of the human rights aspects are expected to be reduced.

**Table 297: Human Rights Risk Classification**

| Definition | Risk Classification |
|---|---|
| Human rights violation is in place and no mitigation measure can be applicable. | **High** |
| Potential risks are in place for workers and external stakeholders but can be mitigated with appropriate control measures. | **Medium** |
| The risks are in place for workers and external stakeholders at minimum level in general and can be further mitigated with additional control measures. | **Low** |

#### 7.3.1.9.4 Human Rights Management Plan and Mitigation Measures

The mitigation measures are developed and presented in the relevant sections in Table 298.

A Human Rights Management Plan for the Project will be prepared and implemented. All subcontractors will be informed about the HRMP of the Project and this policy will be put in the visible locations of the Project site. The HRMP will include the following topics at minimum:

- Incorporate respect for human rights into management, governance practices and programs as defined in the International Bill of Human Rights and the International Labour Organization's Declaration on Fundamental Principles and Rights at Work,
- Contractors, suppliers, and business partners to share this commitment to human rights, including those in regard to working conditions, freedom of association, freedom of speech, collective bargaining, maximum working hours, fair wages and benefits, equal opportunity and freedom from discrimination,
- Not discriminate against any individual based on race, colour, national or ethnic origin, religion, age, sex, sexual orientation, sexual minorities, religious minorities, ethnic minorities, gender identity or expression, marital status, family status, pregnancy, disability status, genetic characteristics or any other arbitrary characteristic unrelated to the individual's job performance,
- Promote diversity at all levels of the Project,
- Enhance employment, supply chain, training, and community investment programmes to advance the socio-economic empowerment of women in local communities, and eliminate barriers to the advancement and fair treatment of women in workplaces,
- Respect the collective and customary rights of local communities residing near the Project construction and operation areas and ensure consultation with all relevant stakeholders is taken,
- Subscribe to the principle of informed consent when working on private land,
- Strive for continuous improvement in upholding and respecting human rights through ongoing dialogue with internal and external stakeholders,
- Continue to not engage in all forms of child labour, forced labour and modern slavery for all activities engaged and across the entire supply chain,
- When working with public or private security forces, implement a human rights and security approach consistent with the Voluntary Principles on Security and Human Rights,
- Establish confidential mechanisms to identify, receive and respond to human rights and ethical concerns from any stakeholder and in a neutral manner,
- Continually review and evaluate changing human rights conditions in the jurisdictions.
- Take action to terminate any contracts or arrangements with the contractors and suppliers if their practices and performance conflict with the requirements of the Human Rights Management Plan.

#### 7.3.1.9.5 Residual Impacts

Human rights impacts are primarily influenced by the local human rights context and the nature of a project's specific activities. An adverse human rights impact occurs when an action removes or reduces the ability of an individual to realize their human rights. It is important to note that potential issue areas typically considered in the ESIA are similar to that key to human rights, such as civil and political rights, labour rights, social rights, vulnerability and community health and safety. Table 298 assesses the Project-specific human rights context and determine the level of risk in terms of human rights.

**Table 298: Human Rights Impact Assessment**

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| **Civil and Political Rights** | | | | | | |
| Right to life and security of person | As stated in EP4 Guidance Note, individuals have the right not to be deprived of life arbitrarily or unlawfully. This includes the right to have one's life protected, for example, from physical attacks or health and safety risks.<br>The human rights risks in terms of right to life may occur under the categories of security, community and occupational health and safety.<br>For example, security risks may occur as the lethal use of force by security forces to protect company resources, facilities, or personnel.<br>As for the health and safety, operations that pose life-threatening safety risks to workers or neighbouring communities through, for example, exposure to toxic chemicals.<br>The likelihood of such risks is determined as low for the Project. Yet, to make sure the risks are minimized, certain mitigation measures need to be followed. | ▪ Local communities<br>▪ Project workers | Scale: High<br>Scope: Low<br>Remediability: Low<br>Likelihood: Low | **Medium** | The following plans and procedures are relevant and implemented for the mitigation measures in case of potential risks on right to life:<br>▪ Human Rights Management Plan<br>▪ Community Health, Safety and Security Procedure<br>▪ Occupational Health and Safety Management Plan<br>▪ Environmental and Social Management Plan<br>▪ Traffic Management Plan<br>▪ Emergency Response Plan<br>▪ Blasting and Explosives Procedure<br>▪ Fire Prevention and Protection Procedure<br>Before the construction, local communities will be informed about the risks of the entering the construction sites.<br>Security personnel will patrol the site area to prevent any unauthorized access onto the site.<br>Conflict Management Training will be provided to security personnel.<br>The grievance mechanism for the Project will capture all grievances raised in relation to security and safety issues. These will be addressed promptly, and actions will be taken. | **Low** |
| Freedom of thought and opinion | According to Article 25 of Constitution of Republic of Türkiye. Everyone has the right to freedom of thought and opinion. No one shall be compelled to reveal his thoughts and opinions for any reason or purpose, nor shall anyone be blamed or accused on account of his thoughts and opinions.<br><br>According to Human Rights Watch (World Report 2024), there are current human rights risks concerning Freedom of Expression, Association, and Assembly in Türkiye. Thus, the likelihood of risks on freedom of thought and opinion is assessed as medium. | ▪ Local communities<br>▪ Project workers | Scale: Medium<br>Scope: Medium<br>Remediability: High<br>Likelihood: Medium | **Medium** | Project-specific Stakeholder Engagement Plan and External and Internal Grievance Mechanisms will be implemented to provide a space for the stakeholders to express their thoughts and the opinions on the Project.<br>The grievance mechanism will allow anonymous submission of grievances. | **Medium** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| Right to information | Law on the Right to Information No. 4982 (Issued on 24.10.2003, Official Gazette No. 25269) regulates the procedure and the basis of the right to information according to the principles of equality, impartiality and openness that are the necessities of a democratic and transparent government. Everyone has the right to information on the activities of public institutions and professional organisations, which qualify as public institutions.<br><br>No public meeting or consultation has been conducted at this stage of the Project. Yet, a Project-specific SEP has been prepared and stakeholder engagement programme has been developed. | ▪ Local communities<br>▪ Project workers | Scale: Medium<br>Scope: Medium<br>Remediability: High<br>Likelihood: Medium | **Medium** | The Project specific Stakeholder Engagement Plan will be implemented in all phases of the Project.<br>ESIA disclosure activities will be performed to inform all stakeholders of the Project impacts.<br>During the construction and operation phases of the Project, all stakeholders will be informed about the status of the Project with various tools including the face-to-face meetings, project website, media.<br>Project SEP, NTS will be shared at the Project website and with the mukhtars of the neighbourhoods within the AoI and local communities.<br>The SEP will be updated throughout the Project and shared with stakeholders. | **Low** |
| **Labour Rights** | | | | | | |
| Working conditions and working hours | The Turkish Labour Law sets rules for starting and ending of an employment relationship. Employment starts with an employment contract. The employment contract is not subject to any special form unless the contrary is stipulated by the Law. Workers are free to terminate their working contracts following the advance notice periods, and without an advance notice in situations of just cause identified by Labour Law Article 24. Wages may be paid in cash on a monthly basis, or more, but no less frequently. According to Labour Law Article 41, overtime work requires the employee's consent.<br><br>Within the scope of the Project, 3,300 workers will be employed at the construction phase of the Project. National requirements, ILO Conventions ratified by Türkiye and IFC PS2 will be | ▪ Project workers | Scale: High<br>Scope: Medium<br>Remediability: Medium<br>Likelihood: Low | **Medium** | The Project will implement Human Resources Policy, Human Resources Management Plan and Occupational Health and Safety Management Plan in compliance with the IFC PS-2 on Labour and Working Conditions. Such policies are expected to provide more predictable employment opportunities for direct and indirect employees.<br>A Human Rights Management Plan will also be prepared and implemented to eliminate human rights risks associated with labour and working conditions.<br>The copies of relevant human resources policy and any collective agreements will be readily available to workers.<br>Formal, and transparent recruitment process will be implemented to provide equal opportunity to the applicants.<br>The employees will be provided with a written contract. The contracts as a minimum will include information on terms and conditions of employment, including the period of employment, wages, hours of work, overtime arrangements, procedures for termination of the contract and any benefits. The contract will be in the native language of the employee, and it will be clear and understandable to the employee. A copy of contract will be given to the employee. | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| | applied both direct and contractor workers. | | | | Equal tender process will be applied.<br>Necessary measures will be ensured for the safety and health protection of workers, including prevention of occupational risks and provision of information and training, as well as provision of the necessary organization and means and shall ensure that these measures are adjusted taking account of changing circumstances and aim to improve existing situations.<br>Project specific Camp Site Management Plan will be prepared and implemented within the scope of the Project in line with the IFC/EBRD's Guidance Note on Workers' Accommodation, 2009. | |
| Wages | The Labour Law (Law No. 4857, 2003) includes provisions on wages, their renumeration and payment conditions and stipulates that with the object of regulating the economic and social conditions of all employees working under an employment contract, either covered or uncovered by the Law, the minimum limits of wages shall be determined every two years at the latest by the related Ministry. | ▪ Project workers | Scale: High<br>Scope: Medium<br>Remediability: High<br>Likelihood: Low | **Medium** | Wages, benefits and conditions of work offered will be comparable to those offered by equivalent employers in İstanbul and Tekirdağ and the same sector.<br>The contracts of the workers will include the information regarding to salary and annual increase.<br>Payroll records of the direct and indirect workers will be controlled by the Client strictly.<br>All workers will be paid equal for equal jobs.<br>Human Resources Policy will be implemented.<br>Human Resources Policy, Human Resources Management Plan and Human Rights Management Plan will be implemented.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | **Low** |
| Non-discrimination | Labour Law: Article 5 of the Labour Law of Türkiye regulates the ban of discrimination in employment. According to that article 'no discrimination based on language, race, sex, political opinion, philosophical belief, religion and sex or similar reasons is permissible in the employment relationship. The same article also serves as a base for the principle of equal pay for equal value of work by stating that "differential remuneration for similar jobs or for work of equal value is not permissible." | ▪ Project workers | Scale: High<br>Scope: Medium<br>Remediability: Medium<br>Likelihood: Low | **Medium** | Human Rights Management Plan will be prepared and implemented.<br>An employee code of conduct will be prepared and implemented to ensure non-discrimination among employees.<br>Equality of treatment and prohibition of harassment in the workplace, commitment on continual improvement, consultation and participation of workers will be promoted.<br>Employment decisions, such as recruitment, dismissal, promotion, will be transparent and will not be made (directly or indirectly) on the basis of personal characteristics such as sex, race, nationality, etc., but rather on the ability to do the job.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| Right to form and join trade unions and the right to strike | Unions and Collective Agreements Law No. 6356 (dated on 07.11.2012, Official Gazette No. 28460) ensures the rights of the workers to join the union and right to strike. However, unionisation is not a common practice in Türkiye. | ▪ Project workers | Scale: Medium<br>Scope: Medium<br>Remediability: Medium<br>Likelihood: Medium | **Medium** | The Client is committed to respecting and preserving the rights of workers to freely form and join trade unions, as guaranteed by international and national laws. Additionally, the Client recognizes the right of workers to engage in lawful strikes as a fundamental means of collective bargaining and will work to ensure that these rights are upheld while considering the broader interests of stakeholders and maintaining essential services.<br>In case of the absence of the unions, workers representatives should be elected, and periodical meetings will be held with the representatives.<br>The employer shall consult workers or representatives authorized by trade unions in enterprises with more than two workers' representatives or workers' representatives themselves in the absence of trade union representative to ensure the consultation and participation of workers.<br>Human Resources Policy, Human Resources Management Plan and Human Rights Management Plan will be implemented.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | **Low** |
| Right not to be subjected to slavery, servitude or forced labour | Turkish Constitution: Article 18 of the Constitution states that “No one can be forced to work. Slavery is prohibited.”<br>Employers are not allowed to take deposits of money from workers and retain ID Cards.<br>However, in construction projects carried out in Türkiye, it can often be seen that overtime exceeds local standards due to the signing of a fixed-term work contract and the high turnover of employees due to the nature of the projects.<br>In addition, work on the national day and public holidays can be required. | ▪ Project workers | Scale: High<br>Scope: Medium<br>Remediability: Medium<br>Likelihood: Low | **Medium** | In compliance with the article 44 of the Labour Law employee’s consent will be taken into consideration during the arrangements of the work on national day and public holidays. The issue of whether or not work will be done on the national day and public holidays will be decided by the collective agreement or by employment contracts. The employee’s consent is required if there is no provision in the collective agreement or in employment contracts.<br>There will not be forced labour and employees will be free to terminate their employment in accordance with national law.<br>Shift schedule of the direct and indirect workers will be strictly monitored and the annual overtime working hours will not extend 275 hours.<br>Human Resources Policy, Human Resources Management Plan and Human Rights Management Plan will be implemented.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | **Low** |
| Right to abstain from work | According to Occupational Health and Safety Law No. 6331, workers have the right to | ▪ Project workers | Scale: Medium<br>Scope: Medium | **Low** | In the event of serious, imminent, and unavoidable danger; workers shall leave their workstation or dangerous area and proceed to a place safety. | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| | leave their workstation in the event of serious, imminent and unavoidable danger. | | Remediability: Medium<br>Likelihood: Low | | Workers may not be placed at any disadvantage because of their action.<br>Human Resources Policy, Human Resources Management Plan, Occupational Health and Safety Management Plan and Human Rights Management Plan will be implemented for these mitigation measures.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | |
| Right to social security, including social insurance | Social Insurance and General Health Insurance Act No. 5510 of 31 May 2006 determines the rights of beneficiaries and provides for general rules for the functioning of the insurance system and funding conditions. Also contains provisions on employers and workplaces, short-term and long-term insurances.<br>All direct and indirect workers will have right for social insurance and general health insurance; however, for the construction sector it is a common implementation to pay insurance on the minimum wage regardless to the salary which will create decrease on the pension payment. | ▪ Project workers | Scale: High<br>Scope: Medium<br>Remediability: High<br>Likelihood: Low | **Medium** | Social insurance payments of all direct and indirect workers will be strictly controlled by the Client.<br>Human Resources Policy, Human Resources Management Plan, Occupational Health and Safety Management Plan and Human Rights Management Plan will be implemented.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | **Low** |
| Labour standards in Supply chain | Not all rights potentially impacted by a project are necessarily within the client's immediate control as in the case of supply chain. Project activities may unknowingly pose risks through the supply chains. In the supply chain of motorway projects, human rights risks related to labour standards can include forced labour, unsafe conditions, wage violations, and restrictions on workers' rights. Especially women and children may be subject to particularly severe impacts in such situations. | ▪ Workers in the supply chain | Scale: High<br>Scope: High<br>Remediability: Medium<br>Likelihood: Low | **Medium** | The Client will supply necessary products from companies/countries that comply with the international labour standards in which human rights violations are eliminated at the highest level. Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the supply chain will be prepared and implemented.<br>Human Rights Management Plan will be prepared and implemented.<br>The Client will not meet Project's material needs from suppliers where forced and child labour is being used.<br>The Client will ensure the suppliers' compliance with the codes of conduct for suppliers based on international labour standards.<br>All suppliers and vendors will have the responsibility to ensure the Client's quality standards are | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| | | | | | achieved. This may include quality inspections by the Client, if deemed necessary. | |
| Grievance Mechanism | The fundamental legal base rights on the freedom and rights of the citizens with respect to communication, expression and dissemination of thought, and information request are guaranteed by the Constitution of the Republic of Türkiye.<br>The Article of the Constitution on the Right of Petition, Right to Information and Appeal to Ombudsperson specifies that the citizens and foreigners resident in Türkiye, on the condition of observing the principle of reciprocity, have the right to apply in writing to the competent authorities and to the Grand National Assembly of Türkiye regarding the requests and complaints concerning themselves or the public.<br>The Presidency's Communication Centre (CIMER) has been providing a centralised complaint system for Turkish citizens, legal persons and foreigners. CIMER will be available to Project stakeholders as an alternative and well-known channel for conveying their Project-related grievances and feedback directly to the state authorities.<br><br>A Project-specific grievance mechanism both for the Project workers and the local communities will be prepared and implemented. | ▪ Local communities<br>▪ Project workers | Scale: Medium<br>Scope: High<br>Remediability: High<br>Likelihood: Low | **Medium** | A Worker Grievance Mechanism and Community Grievance Mechanism will be prepared and implemented for the Project.<br>Project Stakeholder Engagement Plan and Human Rights Management Plan will be implemented.<br>All direct and indirect workers will be informed on the Project specific documents and the procedures including the grievance mechanism. | **Low** |
| **Economic, Social and Cultural Rights** | | | | | | |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| Right to an adequate standard of living and housing | The Project will require permanent acquisition of lands by expropriation. The Project may cause economic displacement and physical resettlement, however, at this stage, the magnitude of displacement is not completely known since the land acquisition files have not been prepared for the Project.<br><br>It should be noted that in Türkiye, the acquisition and the expropriation process are held in compliance with the Turkish Expropriation Law which does not include the rights of the informal land users, vulnerable people and the livelihood restoration.<br><br>In addition, 1 camp site will be established within the scope of the Project. | ▪ Local communities<br>▪ Project workers | Scale: High<br>Scope: High<br>Remediability: Medium<br>Likelihood: Medium | **High** | If needed, RAP and LRP will be conducted. In line with the study, Resettlement Framework will be prepared and implemented for the Project.<br><br>Stakeholder Engagement Plan will be prepared and implemented.<br><br>Grievance mechanism will be prepared and implemented.<br><br>A robust community consultation and engagement process will be established to ensure that all affected parties, including informal land users and vulnerable groups, are informed and involved in decision-making. Special attention should be given to providing information in accessible formats and languages, and to involving women and other marginalized groups in the consultation process.<br><br>Influx Management Procedure and Camp Site Management Plan will be implemented.<br><br>For the monitoring process, Environmental and Social Monitoring Plan will be implemented.<br><br>Project specific Camp Site Management Plan will be prepared within the scope of the Project in line with the IFC/EBRD's Guidance Note on Worker's Accommodation, 2009. EPC Contractor will ensure that subcontractors' construction camp sites are in compliance with the Project standards as well. | **Medium** |
| Right to health, food, water, and sanitation | Potential risks to local communities identified in the ESIA include traffic increase in construction, communicable diseases, construction related environmental impacts, and increased need for resources.<br><br>1 camp site and 2 sub-construction sites will be established within the scope of the Project. The total number of workers which will be stay in the camp is not certain yet. There will be no accommodation in sub-construction sites. These sites will be used by the workers for lunch and there will be offices for HSE department. | ▪ Local communities<br>▪ Project workers | Scale: High<br>Scope: Medium<br>Remediability: High<br>Likelihood: Low | **Medium** | Community Health, Safety and Security Procedure, Traffic Management Plan, Waste Management Plan, Security Management Plan, and Environmental and Social Management Plan will be prepared and implemented.<br><br>Influx Management Procedure and Camp Site Management Plan will be implemented.<br><br>For the monitoring process, Environmental and Social Monitoring Plan will be implemented.<br><br>Project specific Camp Site Management Plan will be prepared within the scope of the Project in line with the IFC/EBRD's Guidance Note on Worker's Accommodation, 2009. EPC Contractor will ensure that subcontractors' construction camp sites are in compliance with the Project standards as well. | **Low** |
| Right to take part in cultural life | As indicated in EP4 Guidance Note, individuals have a right to take part in the cultural life of society and enjoy the benefits of scientific progress, especially disadvantaged groups. Potential risks may include activities involving resource extraction or | ▪ Local communities<br>▪ Project workers | Scale: Medium<br>Scope: Low<br>Remediability: Medium<br>Likelihood: Low | **Low** | Human Rights Management Plan and Stakeholder Management Plan will be implemented. | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| | new construction could impact this right by separating groups from areas of cultural importance and knowledge, or by damaging their cultural heritage. | | | | | |
| **Rights of Vulnerable Groups** | | | | | | |
| Migrant workers | As indicated in the EP4 Guidance Note, the International Convention on the Protection of the Rights of All Migrant Workers and Members of their Families establishes how migrant workers, and their families should be protected.<br><br>Also, according to Human Rights Watch (World Report 2024), there are current human rights issues and risks concerning Refugees, Asylum Seekers, and Migrants in Türkiye.<br>Migrant workers will not be employed in the Project. | ▪ Project workers | Scale: High<br>Scope: Low<br>Remediability: Medium<br>Likelihood: Low | **Low** | Considering OHS, working conditions and personnel rights, migrant workers will not be allowed to work unregistered in the field and monitoring studies will be carried out on this issue.<br>Human Resources Policy, Human Resources Management Plan, Occupational Health and Safety Management Plan and Human Rights Management Plan will be implemented for relevant mitigation measures.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | **Low** |
| Right of protection for the children | Labour Law No. 4857, Article 71 states that employment of children who have not reached the age of fifteen is prohibited. However, children who have reached the age of fourteen and have completed their primary education may be employed in light labour that will not hinder their physical, mental or moral development. For those who continue their education, they may only work jobs that will not prevent their school attendance. | ▪ Children<br>▪ Project workers | Scale: High<br>Scope: Low<br>Remediability: Low<br>Likelihood: Low | **Medium** | The Client will prohibit the use of child labour throughout the Project, ensuring compliance with international and national standards for the protection of children's rights and promoting a safe and ethical working environment.<br>The minimum working age will be 18 for all direct and indirect workers.<br>Subcontractor monitoring system will be established by the Client to ensure that all subcontractors comply with work age limits.<br>Human Resources Policy, Human Resources Management Plan, Occupational Health and Safety Management Plan and Human Rights Management Plan will be implemented for relevant mitigation measures.<br>Supply Chain Management Plan and Subcontractor Management Plan which monitors the compliance with the international labour and human rights standards (IFC PS2) of the subcontractors will be prepared and implemented. | **Low** |
| Rights of minorities | It has been observed that the Aydoğdu neighbourhood in Tekirdağ has Romani population who are minority group in Türkiye. During the construction phase of the Project, the camp site along with influx of workers | ▪ Local communities<br>▪ Project workers | Scale: High<br>Scope: Medium<br>Remediability: Medium<br>Likelihood: Low | **Medium** | Cultural awareness training will be provided to the workers who will be accommodated in the camp site.<br>Camp Site Management Plan and Community Health, Safety and Security Procedure will be prepared and implemented. | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| | may create impact on the daily life. | | | | | |
| Women's rights | As indicated in EP4 Guidance Note, The Convention on the Elimination of all Forms of Discrimination Against Women exists to promote women's rights and their protection. The potential risks to women's rights may include the following:<br>▪ Discrimination against women based on their marital status or reproductive status,<br>▪ Company's operations or products have had negative impacts on people's health in a way that discriminates against women (such as by failing to recognize the particular harm to their reproductive health),<br>▪ Project activities pollute or threaten existing water resources in a way that significantly interferes with local communities' ability to access clean drinking water. In such situations, there may be particular negative impacts on women and girls, who are responsible for water collection in many communities.<br>Also, according to Human Rights Watch (World Report 2024), there are current human rights risks concerning Women's Rights in Türkiye, especially stems from Türkiye's withdrawn from the Istanbul Convention. The risks related to the Project can be related to freedom of thought and opinion and access to information. Cultural norms and societal expectations can restrict women's access to information and expression of opinion. | ▪ Women of local communities<br>▪ Female Project workers | Scale: High<br>Scope: Medium<br>Remediability: Medium<br>Likelihood: Medium | **Medium** | Inclusive communication strategies that ensure information is accessible to women will be developed. This can include distributing information through channels that women frequently use, providing materials in local languages, and organizing information sessions specifically for women to ensure they receive and understand critical Project information.<br>Equal pay for equal work especially considerate of women employees will be implemented.<br>Positive discrimination will be applied to female candidates during the recruitment process.<br>The safety and needs of female staff staying in the camp will be met at a high level.<br>Human Resources Policy, Human Resources Management Plan, Occupational Health and Safety Management Plan and Human Rights Management Plan will be implemented for relevant mitigation measures. | **Medium** |
| **Community Health and Safety** | | | | | | |
| Environmental risks | The fundamental law in Turkish Environmental Legislation is the Environmental Law No. 2872 | ▪ Local communities<br>▪ Project workers | Scale: Medium<br>Scope: High | **Medium** | Suitable and sufficient environmental management plans for waste, wastewater, noise and air quality will be established and implemented. | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| | (Issued on 11.08.1983, Official Gazette No.18132, amended by Law No. 5491). According to Environmental Law, citizens, as well as the State, bear responsibility for the protection of the environment based on the “polluter pays” and “user pays” principles.<br>According to the Article 56 of Constitution of Republic of Türkiye Everyone has the right to live in a healthy, balanced environment.<br>It is the duty of the state and citizens to improve the natural environment and to prevent environmental pollution.<br>Since Türkiye is not a not party to the Aarhus and Espoo Conventions, there is no climate change legislation in place. | | Remediability: Medium<br>Likelihood: Low | | Environmental and Social Management Plan of the Project will be implemented.<br>A relationship with municipal environmental department will be established in advance and monitoring of air and noise will be done in accordance with local regulations.<br>The construction route and all operational areas which are operated by the contractor or subcontractors like quarries, tunnel construction locations, transportation routes, construction camp sites, are to be regularly monitored for environmental aspects. In case of a grievance, additional measurements will be held, and the results will be shared with the local communities.<br>The following management plans/procedures will be implemented for preventing and reducing environmental risks:<br>▪ Environmental and Social Management Plan<br>▪ Waste Management Plan<br>▪ Air Quality Management Plan<br>▪ Noise and Vibration Reduction Plan<br>▪ Water Quality Management Plan<br>▪ Pollution Prevention Plan<br>▪ Biodiversity Management Plan<br>▪ Cultural Heritage Management Plan (including and Chance Find Procedure)<br>▪ Environmental and Social Monitoring Plan<br>▪ E&S Policy<br>▪ Blasting and Explosives Procedure<br>▪ Excavation Safety Procedure<br>▪ Fire Prevention and Protection Procedure<br>▪ Camp Site Management Plan<br>The construction site and the construction camp site are to be regularly monitored for environmental aspects. In case of a grievance, additional measurements will be held, and the results will be shared with the local communities. | |
| Security risks | During the construction phase of the Project, unarmed security will be needed on the site and especially during the access to the agricultural lands and the pastureland may create social tension between the security personnel and the local communities.<br>During the peak period of the construction phase of the Project approximately 120 | ▪ Local communities<br>▪ Project workers | Scale: Medium<br>Scope: Medium<br>Remediability: Medium<br>Likelihood: Low | **Medium** | Before the construction, local communities will be informed about the risks of the entering the construction sites.<br>Security personnel will patrol the site area to prevent any unauthorized access onto the site.<br>Community Health, Safety and Security Procedure will be established and implemented by the Contractor, outlining expectations around security.<br>Conflict Management Training will be provided to armed security personnel. | **Low** |

| Topic | Project Context | Stakeholders | Impact Factor Features | Pre-mitigation | Mitigation Measures | Risk Categorization |
|---|---|---|---|---|---|---|
| | unarmed security personnel will be employed. | | | | The grievance mechanism for the Project will capture all grievances raised in relation to security and safety issues. These will be addressed promptly, and actions will be taken. | |

#### 7.3.1.9.6 Monitoring and Key Performance Indicators

The stage of monitoring and evaluation involves subjecting the HRIA itself to assessment in order to determine the extent to which it has met its objectives and is acceptable to stakeholders. This step will also examine the extent to which the duty-bearers have incorporated the recommendations of the HRIAs during the implementation of the policy intervention and enables information-gathering about the actual impacts of the policy intervention. The monitoring activities are defined in Table 299 below. The indicators for monitoring will be followed through the Environmental and Social Monitoring Plan and Human Rights Management Plan to be prepared specifically for the Project.

**Table 299: Human Rights Risks Monitoring Process**

| Activity | Steps | Areas For Further Attention and Considerations | Frequency | Responsibility |
|---|---|---|---|---|
| Reporting | Share the main findings and lessons learnt of the process with the stakeholders and ensure that their views are adequately reflected in the report.<br>Discuss possible mitigation measures and ensure these reflect preferred mitigations measures of the stakeholders.<br>Manage expectations of the stakeholders regarding the report to avoid disappointment and frustration.<br>Ensure that the report is available in appropriate language and shared with the stakeholders in an accessible manner, through websites, posters, leaflet etc.<br>Ensure that the impact management plan adopted by the Project Company/Contractors is communicated to the stakeholders. | Consider using other means of engaging with the stakeholders on the HRIA report, i.e., through media such as visual aids, orally or through participatory exercises, tailored specifically to engage with the stakeholders.<br>Consider holding separate meetings for specific groups of stakeholders to ensure that they have the opportunity to express themselves on the recommended mitigation measures.<br>Given the extensive time it could take, set a reasonable deadline for receiving comments on the HRIA report from the stakeholders. | Biannual | ■ Project Company<br>■ Contractors |
| Supplier Social Responsibility and Labour Standards | In line with the EBRD PR2, eliminate risks related to social and labour issues, including human rights violations, forced labour, child | Ensuring supply chain's compliance with international labour standards and promoting fair labour practices. | Continuous | ■ Project Company |

| Activity | Steps | Areas For Further Attention and Considerations | Frequency | Responsibility |
|---|---|---|---|---|
| | labour, unsafe working conditions, and discrimination.<br>EPC Contractor will supply necessary products from companies/countries that comply with the international labour standards in which human rights violations are eliminated at the highest level. | Evaluating the HSE, Quality, System, Legal and Compliance performance of the suppliers/service providers. | | |
| Engagement Activities | Support the establishment of participatory monitoring mechanisms to allow the stakeholders to be continuously engaged in the follow-up to the report.<br>Suggest regular meetings are held between the Project Company and the stakeholders. | To request ongoing feedback on impacts of the Project from the stakeholders, e.g., through internal and external grievance mechanisms.<br>To publicly report on progress made on the implementation of the mitigation measures in an ongoing manner. | Continuous | ■ Project Company |
| Internal and External Grievance Mechanisms | Implement Project-specific grievance mechanism both for Project workers and local communities.<br>Encourage stakeholders' effective participation in the grievance mechanism.<br>Provide tools in accessible places for stakeholders to raise grievances and requests. | Grievance registration and closing rates to be monitored regularly.<br>Grievance closing percentage target/term target to be determined. | Continuous | ■ Project Company<br>■ Subcontractors |

Monitoring should answer the following questions:

- What mitigating measures have been adopted by the duty-bearers to mitigate any adverse effect foreseen by the HRIA?
- Has any human rights risk and impact that the HRIA foresaw materialized? If so, who were the relevant affected stakeholders? Have the relevant duty-bearers taken measures to mitigate the adverse effects of those risks?

- Have there been major human rights risks and impacts unforeseen by the HRIA? If so, who were the relevant affected stakeholders?
- Suppose some substantial change of the policy intervention occurred after the HRIA was produced (e.g. replication of the policy in another area of the country, a major expansion of the Project, etc.). Have the relevant duty-bearers considered the recommendations of the HRIA when undertaking those changes?
- Have there been recurring grievances related to the policy intervention? If so, who were the relevant affected stakeholders?

Table 300 presents a sample for the Key Performance Indicators (KPIs) applicable for the Project for monitoring and reducing human rights impacts.

**Table 300: KPIs for Human Rights Risks**

| KPI | Interpretation | Responsibility |
|---|---|---|
| A significant number of complaints or grievances are brought to the mechanism in the period after its establishment. | Indicating both awareness of the mechanism's existence and confidence that it provides a credible first avenue of recourse. | ■ Project Company<br>■ Contractors |
| A reduction, over time, in the number of grievances pursued through other non-judicial mechanisms, NGOs or the media. | Indicating both awareness of the mechanism's existence and confidence that it can provide a credible and effective first avenue of recourse. | ■ Project Company<br>■ Contractors |
| Over time, the number of grievances of the same or similar nature decreases. | Indicating that staff are learning from past mistakes and adapting practices and/or operating procedures where appropriate. | ■ Project Company |
| Audits show a reduction in incidents of non-compliance with applicable standards. | Indicating that grievance processes are contributing to the identification and remediation of non-compliance incidents. | ■ Project Company |
| A reduction in absenteeism and staff turnover and/or an increase in productivity among suppliers'/contractors' workers. | A partial indicator of reduced worker grievances and improved worker satisfaction, most relevant in relation to supply chains and contractors. | ■ Project Company |
| Standard operating procedures ("SOPs") have been reviewed and amended where investigations reveal significant and repeat grievances despite staff following existing SOPs. | Indicating that lessons for management systems are being learnt and integrated to reduce the likelihood of the same kind of grievances recurring. | ■ Project Company |

### 7.3.2 Cultural Heritage

The archaeological baseline study is prepared in accordance with the results obtained from the fieldwork during which many new and previously unknown archaeological areas were discovered. Two archaeological areas from the Project Route whose knowledge of being already registered by the Ministry of Culture and Tourism was shared

by the official letter were situated in the region of Tekirdağ Province. The information related to the aqueduct from the aforementioned areas could be accessed from the official website of the Ministry of Culture and Tourism. However, the location of the tumuli could not be estimated.

During the 1st survey (covering the Project Route), a total of 40 archaeological and cultural heritage sites were identified. Among them, also archaeological areas that are previously registered such as the area called “Aqueduct” which is within the borders of the Süleymanpaşa District of Tekirdağ and “Tumuli” which is within the Tekirdağ Province were assessed. Since the exact boundaries of these 2 areas are not known, internet resources were used and an approximate area for the aqueduct was converted with the information obtained from here. The location of the tumuli could not be fully understood, but it must be noted that the 2 tumuli, named HRM-18 and 19, seem to fit to these definitions.

The route survey, covering the reported project access roads, was conducted by archaeologists. While vegetation in certain areas posed challenges during the study, a comprehensive field survey was successfully completed.

The second survey of the cultural heritage field studies focused on associated facilities and project components such as storage areas, quarries, borrow pits, and facility areas. During the 2nd survey (for associated facilities), a total of 65 archaeological and cultural heritage sites were identified. Since the location named Quarry-4 Bıyıkali is a military zone, no investigation could be carried out. Any possible examination in that area is subject to special permission.

Areas from which the Project passes through but were with low or impossible chances of access (rice fields, dense vegetation, high altitude over 2500 m) could not be surveyed. Nevertheless, their inspections were realized through satellite imagery and topographical maps of 1/25,000 scale.

Statistics of archaeological findings during the 1st survey is presented in the Figure 262 below.




**Figure 262: Statistic of Archaeological Findings**

## Impact Assessment Methodology

Impacts on the identified cultural heritages within the Project Route were evaluated according to the “Guidance on Heritage Impact Assessments for Cultural World Heritage (“WH”) Properties” published by International Council on Monuments and Sites (ICOMOS) (Figure 263) [232].

The interrelations between the discovered archaeological sites and the Project Site have been evaluated. The interrelations identified are presented in this chapter with their degree of importance, impact, and sensitivity. The mitigation measures to be followed for minimizing the effects of activities on the cultural heritages are also presented.

The impact assessment was realized for each area using the impact assessment matrix published by ICOMOS in consideration of the find density of the archaeological site, its distance to the Project elements, its archaeological importance together with the damages that may arise from construction. The impact assessment matrix was taken from the Cultural Heritage Impact Assessment (CHIA) Guidance, which is published by ICOMOS, the related unit of UNESCO.

[232](https://www.iccrom.org/sites/default/files/2018-07/icomos_guidance_on_heritage_impact_assessments_for_cultural_world_heritage_properties.pdf).

| VALUE OF HERITAGE ASSET | SCALE & SEVERITY OF CHANGE/IMPACT | | | | |
|---|---|---|---|---|---|
| | No Change | Negligible change | Minor change | Moderate change | Major change |
| For WH properties Very High – attributes which convey OUV | SIGNIFICANCE OF EFFECT OR OVERALL IMPACT (EITHER ADVERSE OR BENEFICIAL) | | | | |
| | Neutral | Slight | Moderate/ Large | Large/very Large | Very Large |
| For other heritage assets or attributes | SIGNIFICANCE OF IMPACT (EITHER ADVERSE OR BENEFICIAL) | | | | |
| Very High | Neutral | Slight | Moderate/ Large | Large/very Large | Very Large |
| High | Neutral | Slight | Moderate/ Slight | Moderate/ Large | Large/Very Large |
| Medium | Neutral | Neutral/Slight | Slight | Moderate | Moderate/ Large |
| Low | Neutral | Neutral/Slight | Neutral/Slight | Slight | Slight / Moderate |
| Negligible | Neutral | Neutral | Neutral/Slight | Neutral/Slight | Slight |

**Figure 263: Impact Matrix defined by ICOMOS Guideline, 2011**

According to the matrix defined by the Guidance, professional expert judgement is used to determine the importance of the resource. The value of the asset is defined using the following grading scale:

- Very High
- High
- Medium
- Low
- Negligible
- Unknown potential.

The scale or severity of impacts or changes is judged by taking into account their direct and indirect effects and whether they are temporary or permanent, reversible or irreversible. The cumulative effect of separate impacts is also considered. The scale or severity of the impact can be ranked without regard to the value of the asset as:

- No change
- Negligible change
- Minor change
- Moderate change
- Major change

Since the discovered cultural heritages within the Project Route are not in the status of “world heritage”, during the identification of the significance of possible impacts on the cultural heritages, the value of heritage assets is categorized according to “value of heritage assets for other heritage assets or attributes” given in Figure 263.

The numbering of the discovered archaeological areas was realized through the coding as Cultural Heritage Area “HRM” for the 1st survey and “CHA” for the 2nd survey. The numbering was realized by taking into consideration the facts such as the interaction of the area with the Project field or its distance to it.

**Table 301: Colour Categorization by Effect**

| Code | Colour | Distance to Project Area (m) | Explanation |
|---|---|---|---|
| **HRM01/CHA01** | | Inside Project Site | High Risk |
| **HRM02/CHA02** | | 0-50 m | Risky |
| **HRM03/CHA03** | | 50-100 m | Medium |
| **HRM04/CHA04** | | 100-150 m | Low |
| **HRM05/CHA05** | | Above 150 m | No Effect |

Detailed investigations and assessments were carried out for the environmental impact, mitigation measures, management, and monitoring of impacts for the phase where the impact on cultural heritages is at maximum.

Considering the risks of potential discoveries during the construction period, movable and immovable archaeological heritage constitutes the focus of the field works.

As per the Chapter 7.1.10 Vibration Impact Assessment, during the construction and operation phases of the Project, generation of vibration is expected due to construction activities and blasting activities (only for quarries), and vehicles passing through the motorway, respectively. Based on that, in consideration with the Project Standards for the vibration sensitive structures, vibration assessments were conducted. As a result, vibration levels resulting from the construction activities and blasting activities are expected to go below the limit value for the vibration sensitive structures after distance of 31 m and 530 m, respectively. On the other hand, vibration levels resulting

from the vehicles passing through the motorway will remain under the limit values for the vibration sensitive structures, at all distances.

According to the assessment, it is expected that construction activities will have a vibration impact on cultural heritage findings of HRM-7, HRM-18, HRM-19, HRM-21, HRM-23, HRM-30, HRM-38, HRM-39 and HRM-40. Based on that, consultation with the Museum Directorate will be carried out for these locations and measures to be identified accordingly will be taken prior to any construction activity at these areas.

In terms of blasting activities, vibration impact will be expected only on the structures close to the 68+000 Quarry and Dereköy Quarry. Based on that, blasting patterns will be optimized and residual vibration impacts on the closest structures resulting from the blasting activities will be in line with the regulatory limit values. The details of the optimization calculations given in the Chapter 7.1.10.

**Limitation:** The most important impact analysis parameter is distance, and to analyse the impact on an archaeological site, the exact location of the facility and the source/type of impact that may occur should be clearly known. The facilities' site boundaries (layouts) were not defined at the time of the field survey and so they were given in large diameters. This study was conducted based on the information that a facility area will be constructed in a suitable location within these areas. Therefore, archaeological impact assessment could be made in a limited way.

#### *7.3.2.1 Impact Analysis*

##### 7.3.2.1.1 Construction Phase

Impacts on cultural heritage may occur during the construction of the Project components. Therefore, the potential impacts on cultural heritage were evaluated for the construction phase since the maximum impacts are expected at this stage). The definition of the potential impacts and impact analysis based on the Guidance of ICOMOS for each cultural asset identified during 1st survey is presented in Table 302 and statistics are show in Figure 264. The definition of the potential impacts and impact analysis based on the Guidance of ICOMOS for each cultural asset identified during 2nd survey is presented in Table 303.

Impact assessment forms of the discoveries are presented in Appendix I.

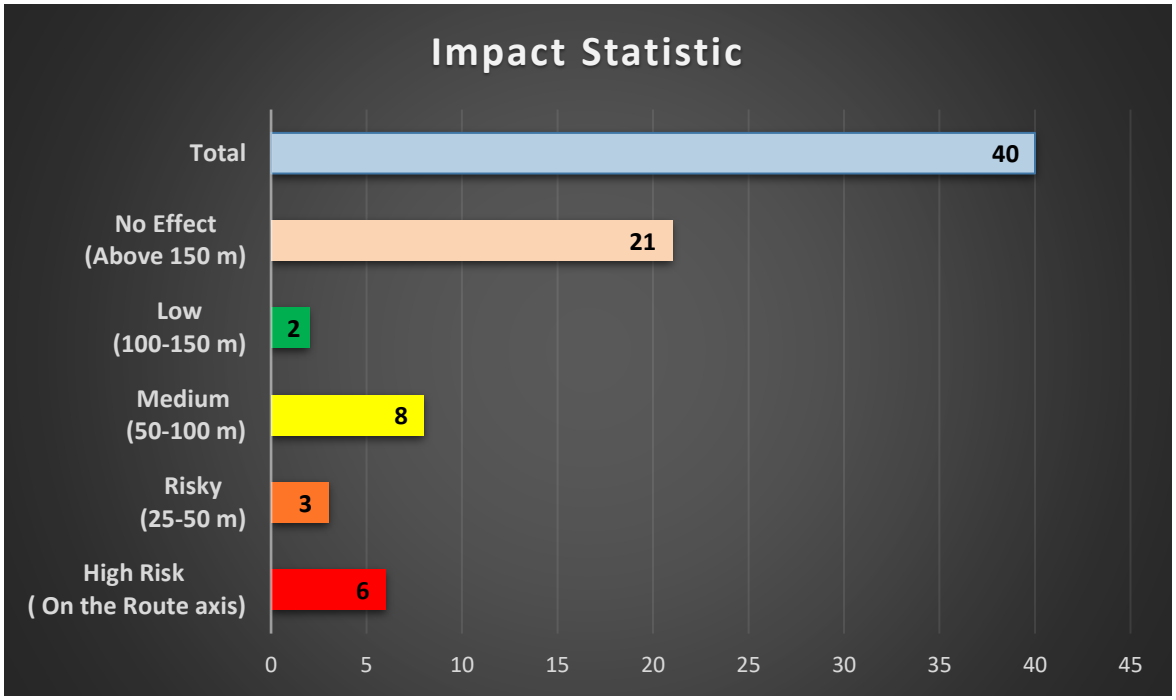



**Figure 264: Impact Statistics**

**Table 302: Impact Analysis Table (1st Survey)**

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| **1** | **HRM-1** | 5+500 | Altun Tepe Tumuli | Roman | 328 m | **5** | **ABOVE 150 M.** **NO EFFECT** | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring.<br><br>The notifications of the museum directorate should be followed. |
| **2** | **HRM-2** | 4+00 | Settlement | Roman and Byzantium | 515+500 | | | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **3** | **HRM-3** | 0+500 | Bridge | Early Republic | Start Point of Access Road | | | No | **Medium** | No Change | Neutral | Neutral | Using the structure for the trespassing of especially heavy tonnage vehicles within the scope of construction activities should be strictly avoided. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **4** | **HRM-4** | NA | Bridge | Early Republic | 2500 m | | | No | **Medium** | No Change | Neutral | Neutral | Using the structure for the trespassing of especially heavy tonnage vehicles within the scope of construction activities should be strictly avoided. The general architectural layout has various deformations. If its use by the Project vehicles is unavoidable, then speed limitation warnings and preventions must be utilized. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **5** | **HRM-8** | 17+500 | Settlement | Late Roman/Byzantium | 320 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **6** | **HRM-9** | Marmara Ereğlisi Access Road | Tumuli | Roman Era | 650 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **7** | **HRM-10** | 18+500 | Bridge | Ottoman Era | 2600 m | | | Yes | **Medium** | No Change | Neutral | Neutral | Extra care should be taken in the selection of alternative routes that can lead to the Project Site and heavy tonnage loads should not be passed over this specific bridge. Said so, it is recommended that this bridge should be recorded on constraint maps, its possible use must be avoided, and if any transitions are inevitable, they must be realized under the supervision of archaeologists when necessary. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **8** | **HRM-13** | 33+800 | Flat settlement | Late Ottoman Era | 380 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **9** | **HRM-14** | 40+050 | Flat settlement | Late Ottoman Era | 450 m | | | No | **Low** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **10** | **HRM-15** | 41+500 | Potential Tumuli | Roman Era | 330 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **11** | **HRM-16** | 47+00 | Settlement and Necropolis | Roman Era | 160 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring.<br><br>The notifications of the museum directorate should be followed. |
| **12** | **HRM-17** | 50+00 | Flat settlement | Late Ottoman Era | 750 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **13** | **HRM-20** | 60+00 | Flat settlement and Tomb | Late Ottoman Era | 560 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **14** | **HRM-22** | 60+300 | Necropolis | Byzantium | 205 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **15** | **HRM-25** | 61+800 | Aqueduct | Roman Era | 235 m | | | Yes | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **16** | **HRM-26** | 63+100 | Necropolis | Byzantium | 200 m | | | No | **High** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **17** | **HRM-29** | 73+400 | Rural settlement | Roman | 230 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **18** | **HRM-31** | 78+300 | Cemetery | Modern | 355 m | | | No | **Low** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | Although the archaeological site is not close to the route, this cemetery is considered within the scope of intangible and tangible cultural heritage. Passing of construction machinery from this section must be strictly avoided especially during the construction phase and people that will come to visit the cemetery should not be disturbed. |
| **19** | **HRM-32** | 81+00 | Cemetery | Ottoman and Modern | 308 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>Although the archaeological site is not close to the route, this cemetery is considered within the scope of intangible and tangible cultural heritage. Passing of construction machinery from this section must be strictly avoided especially during the construction phase and people that will come to visit the cemetery should not be disturbed. |
| **20** | **HRM-33** | 90+700 | Flat settlement | Byzantium | 335 m | | | No | **High** | Negligible Change | Neutral/Slight | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) Ranking | Code Categorization (Interaction of the area with the Project) Explanation | Registration Status | Impact Analysis as per ICOMOS Guidance: Value of Heritage Asset | Impact Analysis as per ICOMOS Guidance: Scale of Impact | Impact Analysis as per ICOMOS Guidance: Significance of Impact before Mitigation Measure | Impact Analysis as per ICOMOS Guidance: Significance of Residual Impact (After Mitigation Measures | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **21** | **HRM-34** | 91+100 | Flat settlement | Byzantium | 205 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **22** | **HRM-27** | 63+300 | Settlement and Necropolis | Ottoman | 148 m | **4** | **100-150 M LOW** | No | **Medium** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **23** | **HRM-36** | 97+600 | Flat settlement | Byzantium | 105 m | | | No | **High** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **24** | **HRM-5** | 7+501 | Mound | Roman | 53 m | **3** | **50-100 m Medium** | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **25** | **HRM-6** | 9+800 | Settlement | Byzantium-Ottoman | 63 m | | | No | **High** | No Change | Neutral | Neutral | The Project Route passes through the southern part of the identified area. There is no direct contact with the Project Route. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **26** | **HRM-11** | 22+300 | Flat settlement | Late Ottoman Era | 80 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **27** | **HRM-12** | 34+500 | Flat settlement | Late Ottoman Era | 84 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **28** | **HRM-24** | Around Km 61<br>Access Road | Potential Tumuli | Roman Era | 75 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **29** | **HRM-28** | 67+200-<br>Access Road | Flat settlement | Late Ottoman Era | 52 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **30** | **HRM-35** | 91+800 | Settlement and Necropolis | Late Roman/Byzantium | 65 m | | | No | **High** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) Ranking | Code Categorization (Interaction of the area with the Project) Explanation | Registration Status | Impact Analysis as per ICOMOS Guidance: Value of Heritage Asset | Impact Analysis as per ICOMOS Guidance: Scale of Impact | Impact Analysis as per ICOMOS Guidance: Significance of Impact before Mitigation Measure | Impact Analysis as per ICOMOS Guidance: Significance of Residual Impact (After Mitigation Measures | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **31** | **HRM-37** | 100+200 | Necropolis | Roman Era | 97 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **32** | **HRM-23** | Access Road | Flat settlement | Late Ottoman Era | **5** | **2** | **0-50 m Risky** | **No** | **Medium** | Moderate Change | Moderate | Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **33** | **HRM-30** | 74+100 | Flat settlement | Late Ottoman Era | 10 m | | | No | **Medium** | Minor Change | Slight | Neutral/Slight | Due to its proximity to the archaeological site Museum-controlled pre-works within the area are advised. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) Ranking | Code Categorization (Interaction of the area with the Project) Explanation | Registration Status | Impact Analysis as per ICOMOS Guidance: Value of Heritage Asset | Impact Analysis as per ICOMOS Guidance: Scale of Impact | Impact Analysis as per ICOMOS Guidance: Significance of Impact before Mitigation Measure | Impact Analysis as per ICOMOS Guidance: Significance of Residual Impact (After Mitigation Measures | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **34** | **HRM-40** | 105+00 | Potential Necropolis | Late Roman/Byzantium | 35 m | | | No | **High** | Negligible Change | Neutral/Slight | Neutral | Due to the proximity of the area to the Project construction site, it is recommended to conduct a museum-controlled preliminary study to clearly understand the spread of the site. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **35** | **HRM-7** | 11+700 | Mound | Chalcolithic, Roman, Byzantium | **On The Route** | **1** | **On The Route Axis**<br>**High Risk** | **No** | **High** | Moderate Change | Moderate / Large | Moderate / Slight | The Project Route passes over the determined area. Thus, a re-evaluation of the route in this specific area is recommended. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **36** | **HRM-18** | Tekirdağ Süleymanpaşa Access Road | Tumuli | Roman Era | **On The Route** | | | **No** | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) Ranking | Code Categorization (Interaction of the area with the Project) Explanation | Registration Status | Impact Analysis as per ICOMOS Guidance: Value of Heritage Asset | Impact Analysis as per ICOMOS Guidance: Scale of Impact | Impact Analysis as per ICOMOS Guidance: Significance of Impact before Mitigation Measure | Impact Analysis as per ICOMOS Guidance: Significance of Residual Impact (After Mitigation Measures | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **37** | **HRM-19** | Tekirdağ Süleymanpaşa Access Road | Tumuli | Roman Era | **On The Route** | | | **No** | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **38** | **HRM-21** | Around KM 60 Access Road | Flat settlement | Late Ottoman Era | **On The Route** | | | **No** | **Medium** | Negligible Change | Neutral/Slight | Neutral | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **39** | **HRM-38** | 102+00 | Flat settlement | Late Roman/Byzantium | **On The Route** | | | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed. Since the area coincides directly with the |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | Project axis, it is recommended to carry out a museum-controlled preliminary study. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **40** | **HRM-39** | 104+200 | Potential Necropolis | Hellenistic Era-Roman | **On The Route** | | | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed. Since the area is directly on the Project axis, it is recommended to carry out a museum-controlled preliminary study. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |

**Table 303: Impact Analysis Table (2nd Survey)**

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| 1 | CHA1 | Çakılköy | Cemetery | Modern | 27,300 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 2 | CHA2 | Çakılköy | Settlement | Late Ottoman | 27,200 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | Since it is very close to the Project facilities, it is recommended to conduct a preliminary study under the supervision of the Museum.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 3 | CHA3 | Çakılköy | Potential Arc. Site | Late Roman | 27,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Medium | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 4 | CHA4 | Danamandıra | Cemetery | Early Rep./Modern | 2,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 5 | CHA5 | Küçüksinekli | Sinekli Train Station | Late Ottoman | On The Access Road | 1 | On The Access Road<br><br>High Risk | Registered | High | Minor Change | Moderate / Large | Slight | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>Since this route is planned to be used during transportation, the slow passing of the heavy tonnage vehicles from this point is recommended. This is especially recommended within the limits of the settlement as the vibration effect that might be created by the heavy load of the trucks can damage the structures. |
| 6 | CHA6 | Beyciler | Cemetery | Early Rep./Modern | 15 m | 2 | 0-50 m<br><br>Risky | Unregistered | Low | Unknown | Neutral/Slight | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 7 | CHA7 | Çeltik | Mound | Hellenistic-Roman | 800 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a site because the settlement area in question should also have a necropolis. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 8 | CHA8 | Çeltik | Tumuli | Roman | 1,200 | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located on the edge of the area called Storage Area – 1 (Çeltik) and at the entrance of the village. These areas should be taken into account in site selection for construction works. Moreover, despite the uncertainty on the state of registration of the aforementioned area the Directorate of the İstanbul Archaeology Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 9 | CHA9 | Yolçatı | Cemetery | Early Rep. / Modern | 480 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 10 | CHA10 | Yolçatı | Settlement | Late Roman | 590 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | The site lies towards the north of Yolçatı Village and stands near the river. It is also located in Storage Area – 1 (Çeltik) area. Particular attention should be paid to this area when choosing a site because the settlement area in question should also have a necropolis.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its |

| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Code Categorization (Interaction of the area with the Project) Ranking | Code Categorization (Interaction of the area with the Project) Explanation | Registration Status | Impact Analysis as per ICOMOS Guidance: Value of Heritage Asset | Impact Analysis as per ICOMOS Guidance: Scale of Impact | Impact Analysis as per ICOMOS Guidance: Significance of Impact before Mitigation Measure | Impact Analysis as per ICOMOS Guidance: Significance of Residual Impact (After Mitigation Measures | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 11 | CHA11 | Çanta | Tumuli | Roman | 2,550 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located almost in the middle of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits on it. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 12 | CHA12 | Çanta | Cemetery | Early Rep. / Modern | 3,050 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 13 | CHA13 | Çanta | Mosque | Late Ottoman | 3,200 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | |
| 14 | CHA14 | Çanta | Church | Late Ottoman | 3,300 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | Medium | Unknown | Neutral | Neutral | It is located to the west of the field named Storage Area-2 (Çanta) and towards the east of the old village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 15 | CHA15 | Çanta | Remains of Old Village | Late Ottoman | 3,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | High | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 16 | CHA16 | Çanta | Cemetery | Late Ottoman | 2,800 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | It is located to the west of the field named Storage Area-2 (Çanta) and towards the east of the old village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| 17 | CHA17 | Çanta | Tumuli | Roman | 750 m | 5 | ABOVE 150 M.<br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits still visible on the tumulus. The tumulus, which is quite high, is among the highest in the region. It is recommended not to work in areas close to the registered tumulus, but if planning has to be done in these areas, the directorate of the İstanbul Archaeological Museums should be informed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 18 | CHA18 | Çanta | Tumuli | Roman | 650 m | 5 | ABOVE 150 M.<br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits still visible on the tumulus. It is recommended not to work in areas close to the registered tumulus, but if planning has to be done in these areas, the directorate of the İstanbul Archaeological Museums should be informed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 19 | CHA19 | Çanta | Tumuli | Roman | 1,050 m | 5 | ABOVE 150 M.<br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits still visible on the tumulus. It is recommended not to work in areas |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | close to the registered tumulus, but if planning has to be done in these areas, the directorate of the İstanbul Archaeological Museums should be informed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 20 | CHA20 | Çanta | Cemetery | Late Ottoman | 1,700 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 21 | CHA21 | Değirmenköy | Tumuli | Roman | 830 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is a potential tumulus. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | |
| | | | | | | | | | | | | | require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 22 | CHA22 | Seymen | Settlement | Late Ottoman | 575 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 23 | CHA23 | Türkgücü | Cemetery | Early Rep./ Modern | 950 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It will likely be affected by any of the construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 24 | CHA24 | Türkgücü | Tumuli | Roman | 1,250 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a site because the settlement area in question should also have a necropolis. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 25 | CHA25 | Türkgücü | Settlement | Late Romann | 1,500 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located within the borders of the area named Borrow Pit-2 (Türkgücü). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. During the construction activities, this area needs to be marked and should be prevented |

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| | | | | | | | | | | | | | from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 26 | CHA26 | Türkgücü | Tumuli | Roman | 680 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 27 | CHA27 | Yenice | Settlement | Hellenistical-Roman | 340 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Since 2 different archaeological sites were identified in the route studies, care should be taken around this area.<br><br>In this aspect, Museum-controlled trial excavations which will be realized during the pre-construction period are strongly recommended to evaluate the potential risks and for making plans for damage prevention.<br><br>As the site lies directly on the Borrow Pit-3 (Yenice) area, the Project operators should act in accordance with the decisions that will be taken by the Museum Directorate or Edirne Regional Board for Preservation of Cultural and Natural Assets.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
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| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | |
| 28 | CHA28 | Karatepe | Settlement | Late Romann | 3,500 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a location.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 29 | CHA29 | Karatepe | Nekropol | Late Romann | 3,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a location.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 30 | CHA30 | Karatepe | Settlement | Late Romann | 3,800 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a location.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 31 | CHA31 | Karatepe | Tumuli | Roman | 2,800 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unknown | High | Unknown | Neutral | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the |

| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Code Categorization (Interaction of the area with the Project) Ranking | Code Categorization (Interaction of the area with the Project) Explanation | Registration Status | Impact Analysis as per ICOMOS Guidance: Value of Heritage Asset | Impact Analysis as per ICOMOS Guidance: Scale of Impact | Impact Analysis as per ICOMOS Guidance: Significance of Impact before Mitigation Measure | Impact Analysis as per ICOMOS Guidance: Significance of Residual Impact (After Mitigation Measures | Recommendation |
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| | | | | | | | | | | | | | relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 32 | CHA32 | Karatepe | Tumuli | Roman | 60 m | 3 | 50-100 m<br>Medium | Unknown | High | Unknown | Moderate/<br>Large | Slight | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered. It has been damaged as a result of agricultural ploughing.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 33 | CHA33 | Sarılar | Tumuli | Roman | 30 m | 2 | 0-50 m<br>Risky | Registered | High | Unknown | Moderate/<br>Large | Slight | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

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| 34 | CHA34 | Sarılar | Tumuli | Roman | 145 m | 4 | 100-150 M<br>LOW | Registered | High | Unknown | Slight | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 35 | CHA35 | Balabanlı | Tumuli | Roman | 80 m | 3 | 50-100 m<br>Medium | Registered | High | Unknown | Slight | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 36 | CHA36 | Balabanlı | Cemetery | Early Rep. / Modern | 5 m | 2 | 0-50 m<br>Risky | NA | Low | Unknown | Moderate/<br>Large | Slight | It is situated at the edge of the shipping route, and it will likely be affected by any of the construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its |

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| | | | | | | | | | | | | | protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 37 | CHA37 | Çevrimkaya | Cemetery | Early Rep. / Modern | 5 m | 2 | 0-50 m<br><br>Risky | NA | Low | Unknown | Moderate/<br><br>Large | Slight | It is situated at the edge of the shipping route, and it will likely be affected by any of the construction works. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 38 | CHA38 | Hüsnülü | Tumuli | Roman | 20 m | 2 | 0-50 m<br><br>Risky | Unregistered | High | Unknown | Moderate/<br><br>Large | Slight | It is located at the edge of the shipping route. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 39 | CHA39 | Hüsnülü | Settlement | Late Romann | 700 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located at the north border of the area known as Storage Area-6 (Hüsnülü). The area should be taken into account in site selection during construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry |

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| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 40 | CHA40 | Hüsnülü | Tumuli | Roman | 60 m | 3 | 50-100 m<br><br>Medium | Unregistered | High | Unknown | Slight | Neutral | It is located within the area known as Storage Area-6 (Hüsnülü). The area should be marked on constraint maps and taken into account in site selection during construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 41 | CHA41 | Hüsnülü | Settlement | Late Romann | 450 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located at the north border of the area known as Storage Area-6 (Hüsnülü). The area should be taken into account in site selection during construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 42 | CHA42 | Hüsnülü | Monumental Tree | Ottoman | On The Access Road | 1 | On The Access Road<br><br>High Risk | Unknown | Medium | Unknown | Slight | Neutral/<br><br>Slight | The monumental tree is in the village but at a point which is very close to the transportation route. It is recommended that the transport vehicles that will use this route should pass slowly and carefully through the settlement, in accordance with the HS rules. Furthermore, additional measures should be taken to prevent the risk of accidents in the area where the relevant monument |

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| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | tree is located. In addition, the Department of Conservation of Natural Assets of the Ministry of Environment, Urbanization and Climate Change should be notified.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 43 | CHA43 | Gazioğlu | Cemetery | Modern | 980 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. These areas should be taken into account during construction works and site selection. The site will likely be affected by construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 44 | CHA44 | Gazioğlu | Settlement | Byzantium-Ottoman | 500 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | Medium | Unknown | Neutral | Neutral | It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. These areas should be taken into account during construction works and site selection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area |

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| | | | | | | | | | | | | | require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 45 | CHA45 | Gazioğlu | Settlement | Byzantium | 45 m | 2 | 0-50 m<br>Risky | Unregistered | Medium | Unknown | Slight | Neutral | It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. These areas should be taken into account during construction works and site selection.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 46 | CHA46 | Köseilyas | Cemetery | Modern | 75 m | 3 | 50-100 m<br>Medium | NA | Low | Unknown | Slight | Neutral | It is located at the north border of the area known as Storage Area-8 (Yenişehir). and lies towards the east of the village. The area should be taken into account in site selection during construction works. The site will likely be affected by any of the construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 47 | CHA47 | Yenişehir | Tumuli | Roman | 45 m | 2 | 0-50 m<br>Risky | Registered | High | Unknown | Slight | Neutral | It is located at the north of the area designated as Storage Area-8 (Yenişehir). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered. |

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| | | | | | | | | | | | | | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 48 | CHA48 | Yağcı | Cemetery | Modern | 1,650 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | It is situated at the Storage Area-9 (Yağcı) and it will likely be affected by any of the construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 49 | CHA49 | Ottoman | Building | Late Ottoman | 1,900 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 50 | CHA50 | Bıyıkali | Cemetery | Ottoman -Late Ottoman -Modern | 2,500 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | It is situated at the northeast of the Bıyıkali basalt quarry that will likely be affected by any of the construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its |

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| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 51 | CHA51 | Bıyıkali | Tumuli | Roman | 750 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali quarry plant. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed.<br><br>Despite the uncertainty on the state of registration of the aforementioned area the Directorate of the İstanbul Archaeology Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged.<br><br>The construction works around the area require archaeological on-site monitoring. |
| 52 | CHA52 | Hacıköy | Tumuli | Roman | 1,500 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali basalt quarry. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed.<br><br>Despite the uncertainty on the state of registration of the aforementioned area the Directorate of the İstanbul Archaeology Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. |

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| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | During the construction activities, this area needs to be marked and should be prevented from being damaged.<br><br>The construction works around the area require archaeological on-site monitoring. |
| 53 | CHA53 | Hacıköy | Cemetery | Modern | 2,400 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | The site is located towards the west of the Bıyıkali basalt quarry and south of the villages entrance. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It will likely be affected by the construction works.<br><br>It is recommended that any construction activities conducted on or around the site should be subjected to archaeological on-site monitoring.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 54 | CHA54 | Hacıköy | Tumuli | Roman | 1,700 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unknown | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali basalt quarry. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 55 | CHA55 | Seymenli | Tumuli | Roman | 850 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unknown | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali quarry plant. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 56 | CHA56 | Seymen | Cemetery | Early Rep.- Modern | 5 m | 2 | 0-50 m<br>Risky | NA | Low | Unknown | Moderate/<br>Large | Slight | It is at the edge of the road route and should be taken into account in site selection during construction works. It will likely be affected by any of the construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 57 | CHA57 | İnecik | Bath | Ottoman | 40 m | 2 | 0-50 m<br>Risky | Registered | Medium | Unknown | Moderate/ | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged.<br>The construction works around the area require archaeological on-site monitoring. |
| 58 | CHA58 | İnecik | Mosque | Ottoman | 90 m | 3 | 50-100 m<br>Medium | Registered | Medium | Unknown | Large | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged.<br>The construction works around the area require archaeological on-site monitoring. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| 59 | CHA59 | İnecik | Government Office | Ottoman | 20 m | 2 | 0-50 m<br>Risky | Registered | Medium | Unknown | Moderate/ | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged. The construction works around the area require archaeological on-site monitoring. |
| 60 | CHA60 | İnecik | Ancient Bridge | Roman | 5 m | 2 | 0-50 m<br>Risky | Registered | High | Unknown | Large | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged.<br>The construction works around the area require archaeological on-site monitoring. |
| 61 | CHA61 | İnecik | Settlement | Ottoman | On The Access Road | 1 | On The Access Road<br>High Risk | Registered | Medium | Unknown | | Moderate/<br>Large | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 62 | CHA62 | İnecik | Road Remain | Ottoman | On The Access Road | 1 | On The Access Road<br>High Risk | Unknown | Low | Unknown | Neutral/<br>Slight | Neutral/<br>Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 63 | CHA63 | İnecik | Cemetery | Ottoman | 350 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unknown | Low | Unknown | Neutral | Neutral | It is situated at the Concrete Batching Plant-3 and it will likely be affected by any of the construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 64 | CHA64 | İnecik | Settlement | Hellenistical-Roman | 55 m | 3 | 50-100 m<br><br>Medium | Unregistered | High | Unknown | Moderate/<br><br>Large | Slight | It is located within the mid to eastern edge of the area designated as Concrete Batching Plant-3. Since many archaeological areas are known to be found around this point this area should be taken into account during construction works and site selection. In this aspect, Museum-controlled trial excavations which will be realized during the pre-construction period are strongly recommended to evaluate the potential risks and for making plans for damage prevention.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| 65 | CHA65 | İnecik | Settlement | Late Ottoman | On The Plant Area | 1 | On The Plant Area<br><br>High Risk | Unregistered | Low | Unknown | Moderate/<br><br>Large | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

In terms of intangible cultural heritage, according to the interviews held with village mukhtars and desktop research, there are various festivals held at the time of harvest depending on the type of agricultural production and rituals that has been held for a long time. The festivals are not held only for promoting the products obtained, but also for activities where people come together, socialize and spend time together. Communities stick to their ethnic identities and still live their traditions, habituate the region. None of the visiting areas will likely be damaged from the activities along the Project Route.

#### 7.3.2.1.2 Operation Phase

Considering the nature of the Project no impacts are expected on the cultural heritage component during the operation phase.

#### 7.3.2.1.3 Decommissioning and Closure Phase

The impacts during the decommissioning phase are likely to be like the construction phase hence the activities will be similar to construction activities. The route is expected to be restored to its previous use.

### *7.3.2.2 Mitigation Measures*

Cultural heritage findings are subject to decisions made by the Museum Directorate. In the initial phase of the Project, any discovered archaeological sites must be reported to the Museum Directorate. In this context, the Project Owner has already informed the relevant museum directorates of the findings of the studies. Preliminary discussions have been held with the Museum Directorate, and the decision-making process is ongoing.

- If the route intersects with archaeological sites, adjustments will be made to the route wherever feasible. For areas where route changes are not possible, the Project Owner will follow the requests of the Museum Directorate. These requests may include:
  - Rescue Excavation: If a site is at risk due to the planned project, the Museum Directorate may request a rescue excavation (or salvage excavation) to be conducted. This type of excavation aims to recover and document cultural heritage before construction or development activities begin. The excavation will be carried out by professional archaeologists, and the findings are documented and preserved. For areas requiring rescue excavations, the region's climatic conditions will be considered, and work will commence promptly after the winter season.
  - Preservation or Capping: In some cases, if excavation is not feasible or if the site needs to be preserved in its original location (in situ), the Museum Directorate might request that the area be covered (capped) and preserved. This method is often used for archaeological sites that are too large or too sensitive to be fully excavated but can still be protected under the surface. If this is the case, the Project Owner will comply with the requirements set by the Museum Directorate in order to preserve the cultural heritage.

Mitigation measures and recommended actions to be taken for each cultural asset are given for each identified asset are given in Chapter 7.3.2.1 and it is recommended that they are followed together with the general mitigation measures given below.

- Indirect impacts to cultural heritage will be avoided or, if not possible, minimized. This will be achieved through an assessment of indirect impacts during the design phase, disclosing and engaging with relevant stakeholders on the results, and incorporating the resulting agreed mitigation into the Project design. The assessment will include indirect impacts such as noise, vibration, visual impacts, and setting.
- Archaeological immovable assets that are located on the Project Route and its area of influence may be buried or covered entirely with vegetation. For this reason, during the deforestation activities on the Project Site, a visual inspection should be conducted by the Client. In compliance with laws no: 5226 and 3386 and

the 4th article of the revised law no: 2863, in case any movable-immovable cultural asset is encountered as a result of the activities conducted during the field preparation and construction stages, the activities should be stopped and Directorate of the İstanbul Archaeology Museum or Museum of Directorate of the Tekirdağ Archaeology Museum should be notified immediately.

- Cultural Heritage Management Plan and Chance Find Procedure, which are necessary for the management of the “chance finds”, have been prepared and presented in Appendix I. All operators, who are to be engaged in the soil works, and Project employees should receive training regarding “project requirements, protection of cultural and archaeological heritage, laws and legislations related with the archaeological and cultural heritage and cultural heritage management plan and chance find procedures”.
- In case of any chance find is encountered during the construction activities, further steps should be taken in accordance with the plans and procedures and the relevant bodies, and the Directorate of the Museum should be notified immediately. In case of any archaeologically potential asset would be discovered, relevant instructions about the sensitivity of the site should be shared with all construction teams a few days before the construction activities. The construction activities will be conducted with appropriate equipment and methods. The appropriate equipment will be identified together with the directorate of the museum and the construction teams.
- Archaeological areas should be notified to the relevant museum directorates immediately.
- In the pre-construction period, meetings should be held with the mukhtars, dates of the activities, rituals etc. for local days or longer activity periods which will be planned to be held in the region should be learned through meetings with the mukhtars and local people. Community should be prevented from being affected by the construction in possible customary practices that can be experienced locally.
- Mobility of the people and vehicles during the activities planned to be held in the region should not be prevented,
- Transit routes should be arranged for uninterrupted access to areas regularly visited by the public,
- Contractors and subcontractors should be trained on the code of conduct, including their approach to relations with local communities, during the employment phase and at regular intervals throughout the Project.
- Information should be provided to contractors and subcontractors on any site-specific sensitivity/issue (e.g., festival locations, dates, events, etc.) regarding intangible cultural heritage.

#### *7.3.2.3 Residual Impacts*

Table 302 and Table 303 summarizes the impacts caused by Project activities on the identified archaeological assets and residual impacts after mitigation measures are applied.

#### *7.3.2.4 Monitoring*

During the construction phase of the Project and road rehabilitation works, on-site archaeological monitoring and vibration monitoring should be conducted in order not to damage the listed identified cultural heritages.

# 8.0 CUMULATIVE IMPACT ASSESSMENT

There is no universally accepted methodology or best practice to assess cumulative impacts, although various guidance documents exist (such as the IFC Good Practice Handbook on Cumulative Impacts Assessment and Management). The approach used in this chapter has been adopted based on the principles of the relevant guidance, previous experience, the nature of the Project, and the information obtained from online EIA platform of Türkiye (for other proposed projects in the AoI).

Cumulative impacts are defined as "… those that result from the successive, incremental, and/or combined impacts of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones." (IFC Good Practice Handbook: Cumulative Impact Assessment and Management).

Cumulative impacts can result from various types of interaction(s) among different impact factors:

- Impacts arising from the accumulation of different impact factors at a specific location or over a specific receptor; as an example, the concurrent presence of the emission of noise and air, visual impact, water resources during construction and operation at the same location.
- Impacts arising from the same impact factor over the same receptor in a different geographic location; as an example the degradation of the same habitats in different locations may harm the population of associated species across their entire distribution area.
- Impacts arising from the concurrent presence of impact factors caused by the Project and other development projects; as an example, we can consider the emission of dust from the construction of the Project and the concurrent construction of a new road or construction/operation of an industrial development at the same location.

According to IFC, cumulative impact assessment is the process of:

- analysing the potential impacts and risks of proposed developments in the context of the potential impact of other human activities and natural environmental and social external drivers on the chosen valued environmental and social components (VECs) over time, and
- proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible.

IFC proposes a six-step approach for CIA study (Figure 265) in the CIA Handbook which has been used for the CIA of the Project.

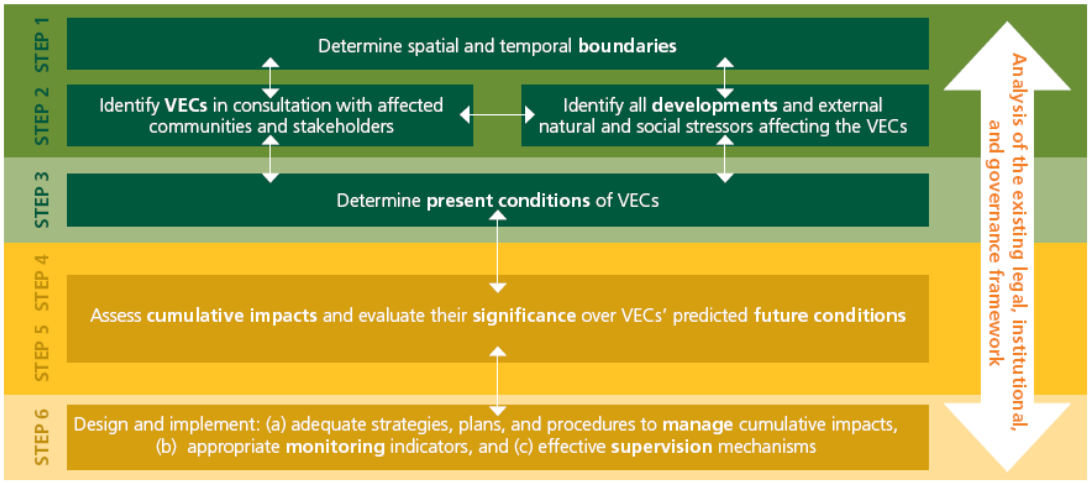



**Figure 265: Cumulative Impact Assessment Methodology**

This chapter presents the implementation of the stepwise methodology detailed in the CIA Handbook and results of the CIA for the Project. Above mentioned steps followed are listed below:

- Step 1: Scoping Phase I – VECs, Spatial and Temporal Boundaries
- Step 2: Scoping Phase II – Other Activities and Environmental Drivers
- Step 3: Establish Information on Baseline Status of VECs
- Step 4: Assess Cumulative Impacts on VECs
- Step 5: Assess Significance of Predicted Cumulative Impacts
- Step 6: Management of Cumulative Impacts

## 8.1 Step 1 – VECs, Spatial and Temporal Boundaries

In the first step of this CIA study, objectives are listed as:

- Identifying and agreeing on VECs in consultation with stakeholders.
- Determining the time frame (temporal boundaries) for the analysis.
- Establishing the geographic scope (spatial boundaries) of the analysis.

### 8.1.1 Valued Environmental and Social Component (VEC)

VECs are defined as fundamental elements of the physical, biological or socio-economic environment, including the air, water, soil, terrain, vegetation, wildlife, fish, birds and land use that may be affected by a proposed project.

In that respect, in this ESIA Report various sensitive receptors, sources and stakeholders have been identified which can be considered as VECs for the CIA. The potential identified VECs for the Project can be listed for construction and operation phases in below:

Construction

- Water Resources
- Soil Quality
- Air Quality
- Noise
- Vibration
- Traffic
- Visual Aesthetics
- Biodiversity
- Social (resettlement and land acquisition, community health and safety, labour influx)

Operation

- Water Resources
- Air Quality
- Noise

- Vibration
- Traffic
- Visual Aesthetics
- Biodiversity
- Social (community health and safety, economy, labour influx)

### 8.1.2 Temporal Boundaries

The temporal boundary of the CIA contains the entire Project lifecycle (i.e., from construction to until the end of decommissioning and closure). However, capability of reasonably predicted future actions and tendencies (including the planning/implementation of other relevant projects in the region) limits the CIA process.

Therefore, for this CIA, consideration is given to the scope that are practical for discussion and assessment of cumulative impacts with the other projects for the construction and the operation phases.

### 8.1.3 Spatial Boundaries

The relevant spatial boundaries for this CIA are the same with each specific Area of Influence (AoI) defined in Chapter 5 for each relevant topic (physical, biodiversity, social, etc.).

## 8.2 Step 2 – Other Activities and Environmental Drivers

Objectives of the Step-2 are to:

- Identify other past, existing, or planned activities within the analytical boundaries,
- Assess the potential presence of natural and social external influences and stressors.

### 8.2.1 Other Activities

In the scope of the CIA study, past, existing, and planned projects and activities which are present in the CIA examination area have been assessed considering the spatial and temporal boundaries explained above. These existing and planned projects and activities have been taken into consideration in the CIA if an ongoing activity has a potential for interaction with the Project.

During determination of the activities, following sources have been used:

- Online EIA Platform of the Turkish Ministry of Environment, Urbanization and Climate Change
- Google Earth satellite views
- Internet searches especially for the motorway routes

Existing, and reasonably planned projects and activities likely to interact with the Project are given in detail in the table below. It should be noted that since the Project route passes mainly along the rural areas, number of other activities within the spatial and temporal boundaries of the Project is quite limited.

**Table 304: Existing and Planned Projects (3rd party facilities) and Activities in the CIA Examination Area**

| No | Project / Activity | Location along the Project Route (Km) | Distance to the Project[233] (m) | Capacity | Condition |
|---|---|---|---|---|---|
| 1 | Malkara-Çanakkale Motorway including 1915 Çanakkale Bridge | 105+300 | 0 | 88.5 km long motorway section including 1915 Çanakkale Bridge (3.363 km long span) | Operation |
| 2 | 2A Group Quarry and Crushing and Screening Plant | 90+000 | 3,900 | 540,000 tonne/year | Status unknown<br><br>*"EIA Positive" decision for the project was obtained on June 09th, 2022.*<br><br>*According to the EIA report, operational life of the project is 15 years and according to the project schedule specified in the EIA report, operating activities started in 2019.* |
| 3 | Port Capacity Increase | 60+000 | 4,800 | 70,000 Deadweight Tonnage dry cargo, bulk cargo, general cargo, and container vessels per year | Under construction |
| 4 | Wind Power Plant | 47+000 | 1,300 | 97.4 MWm / 96.8 MWe | 25 turbines in operation<br><br>10 turbines under construction |
| 5 | Sludge Drying Plant | 34+500 | 2,800 | 192 tonne/day | Status unknown<br><br>*"EIA Positive" decision for the capacity increase was obtained on September 16th, 2022.*<br><br>*According to the EIA report, operational life of the project is 30 years.* |
| 6 | Steel Mill and Rolling Mill Facilities Capacity Increase | 20+200 | 3,000 | Existing steel mill and rolling mill facilities 700,000 tons/year<br><br>It was put into operation in 2002 with its liquid steel production capacity. In addition to the existing facility, a steel mill unit to produce slab products with a capacity of 2,000,000 tons/year and a rolling mill to produce flat products with a capacity of 2,000,000 tons/year will be established. | Under construction |

[233] The distances were taken from the closest points of the past, existing and planned projects to the closest part of the Project components. Project locations have been decided by rule of thumb.

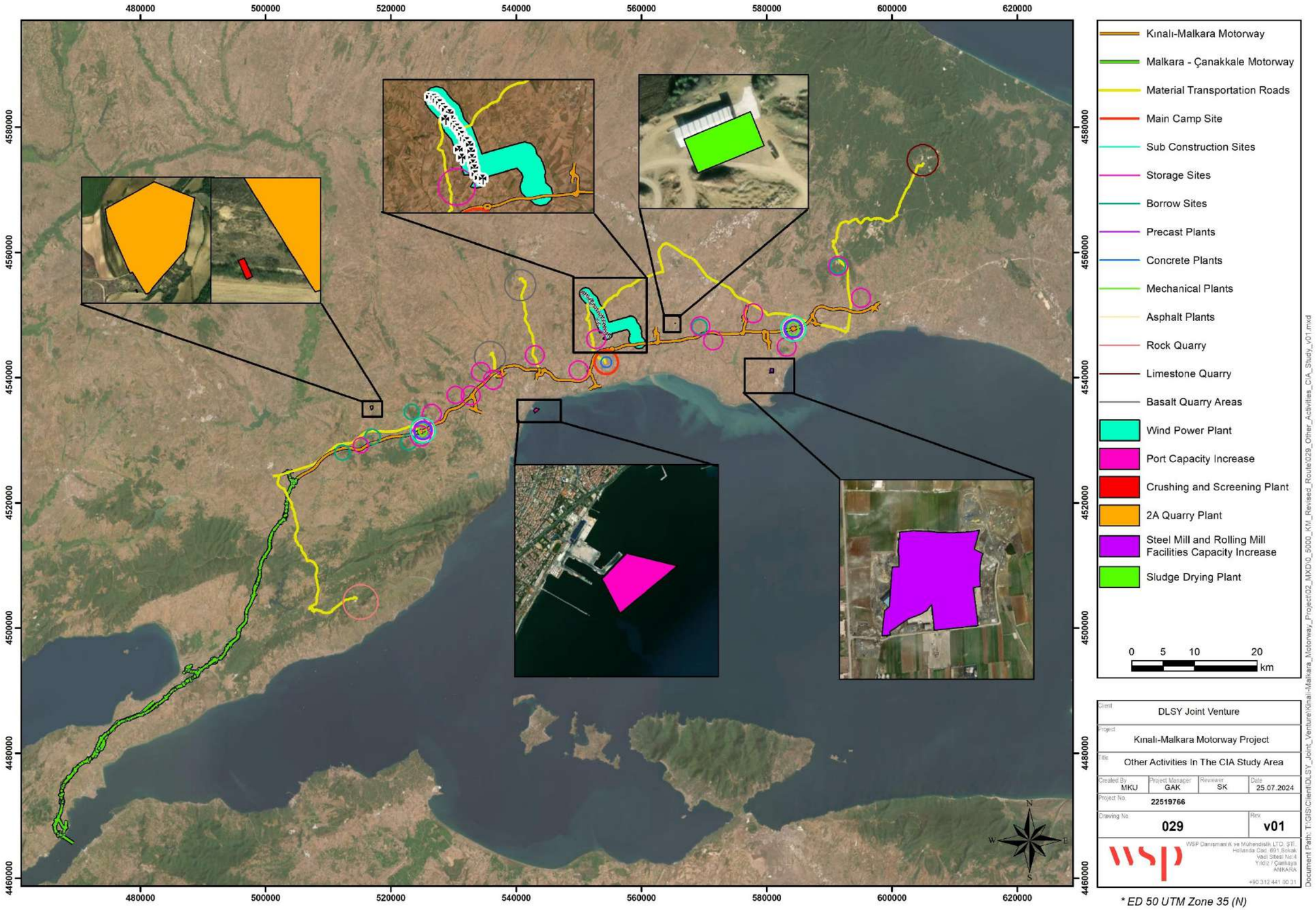



**Figure 266: Other Activities in the CIA Study Area**

### 8.2.2 Environmental Drivers

Environmental drivers are defined as natural drivers and other stressors, such as wildfires, droughts, floods, predator interactions, human migration, new settlements that may exert an influence on the VEC conditions (IFC, 2013).

Environmental drivers have significant impacts on a variety of environmental and social components. Project impacts that discharge pollutants to lakes or rivers, or that withdraw water for industrial or agricultural purposes are likely to be more significant during periods of drought. The fire regime in forested areas is a major driver that shapes social, ecological, and economic systems. For the purposes of CIA, identification of such processes is not a question of new research but is based on existing knowledge of the ecology and/or natural dynamics of the selected VECs.

According to the existing information, no major environmental driver which can create a cumulative impact on selected VECs has been identified.

## 8.3 Step 3 – Establish Information on Baseline Status of VECs

Except for the Sludge Drying Plant Project and 2A Group Quarry and Crushing and Screening Plant whose status are unknown, existing/planned facilities identified in Step 2 were already in their construction or operation periods at the time of baseline studies conducted for the ESIA. Therefore, the baseline measurement results presented in Chapter 6 of this ESIA also reflects the impacts of the construction and operation activities of these 3rd party facilities.

On the other hand, for the Sludge Drying Plant Project, according to the project's EIA Report, the construction phase will last 2 weeks, and the operation period will be 30 years. Since regarding the shortness of the construction phase, the Facility is considered to be in the operational phase during the construction and operation of the Project. For 2A Group Quarry and Crushing and Screening Plant, there will be no construction phase according to the EIA report of the project. However, when project area of the planned crushing plant is examined via Google Earth views, it is observed that no project activity has started in the planned project area, yet.

## 8.4 Step 4 – Assess Cumulative Impacts on VECs

As mentioned in Step 3, except for the Sludge Drying Plant Project and 2A Group Quarry and Crushing and Screening Plant Project, facilities identified in Step 2 were already in their construction or operation periods at the time of baseline studies conducted for the ESIA. The cumulative impacts of these facilities on VECs are already assessed in the Impact Assessment Chapters of the ESIA Report since the baseline studies for the VECs covers the current impacts of these projects defined in Step 2.

Considering the temporal and spatial overlaps, AoI of all the physical, biological, and social components, temporal overlap of the baseline studies, potential impact values of the 3rd party facilities, and the VECs' current residual impacts, only the following topics are scoped in for the cumulative assessment for the construction and operation phases of the Kınalı Malkara Motorway Project:

**Construction Phase**

- Water Resources
- Soil Quality
- Air Quality
- Noise
- Vibration

- Traffic
- Visual Aesthetics
- Biodiversity
- Social (resettlement and land acquisition, community health and safety, labour influx)

**Operation Phase**

- Water Resources
- Air Quality
- Noise
- Vibration
- Traffic
- Visual Aesthetics
- Biodiversity
- Social (community health and safety, economy, labour influx)

Since the information and details regarding the 3rd party projects of other existing/planned facilities are very limited, the cumulative impacts on these VECs for the construction and operation phases of the Kınalı Malkara Motorway Project could only be assessed qualitatively.

## 8.5 Step 5 – Assess Significance of Predicted Cumulative Impacts

Significance of predicted cumulative impacts are given below for the construction and operation phases.

### 8.5.1 Construction Phase

The cumulative impacts on each determined components and VECs are assessed in Table 305 in project level for the construction phase of the Project.

### 8.5.2 Operation Phase

The cumulative impacts on each determined components and VECs are assessed in Table 306 in project level for the operation phase of the Project.

**Table 305: Cumulative Impact Assessment for the Construction Phase of the Project**

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| **Water Resources** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Considering that the nature of the planned project has the adverse impacts of a big infrastructure project, there is a potential for cumulative impacts present at the construction phase in relation to the increased pollution risk to surface and groundwater bodies as a result of accidental spills, sedimentation and overland flow/discharge.<br><br>On the other hand, ÇOK A.Ş. has developed Environmental Management Plan and Water Crossing Plan for the Malkara-Çanakkale Motorway Project which includes mitigation measures and monitoring activities regarding to surface water and groundwater components.<br><br>However, considering the limited overlap of two projects in terms of water impact AoI, the expected cumulative impact of these projects will be **Low** in terms of both Hydrology and Hydrogeology. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |
| 2A Group Quarry and Crushing and Screening Plant | Within the scope of this project, required potable and drinking water is supplied from the existing municipality water network with water tanker. Generated domestic wastewater is stored in septic tank and discharged to the TWSA (Tekirdağ Water and Sewerage Administration General Directorate (TESKİ in Turkish)) wastewater treatment plant. No industrial wastewater generation takes places for this project.<br><br>On the other hand, as this plant is 2 km away from Bent Creek and in its catchment area, which was defined within the Physical Baseline, any spill that may occur can pollute both surface waters and groundwater.<br><br>Considering the local extent and intensity, the expected cumulative impact of this project will be **Low** in terms of both Surface Waters and Groundwater. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |
| Port Capacity Increase | Within the planned project, required potable and drinking water is supplied from the existing municipality water network. Generated domestic wastewater is discharged to the existing municipality sewage network. On the other hand, generated industrial wastewaters from the vessels within the planned project are treated in the wastewater treatment plant of the project in accordance with the Turkish regulatory requirements and discharged to the sewage network accordingly.<br><br>There is a potential for cumulative impacts present at the construction phase in relation to the increased pollution risk to surface and groundwater bodies as a result of accidental spills, sedimentation and overland flow/discharge.<br><br>Moreover, this port, 4,800 m away from the Project Area, is at the downstream of important surface and groundwater bodies in the vicinity of the project area at lower elevations. Furthermore, this port is not in catchments related to the Project defined in the Physical Baseline. For this reason, any spill that may occur will directly leak to the sea instead of water resources in the AoI.<br><br>Therefore, this project will be **Out of Scope** for the expected cumulative impact in terms of both Surface Waters and Groundwater. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Out of Scope (in terms of both Hydrology and Hydrogeology)** |
| Wind Power Plant | Within the scope of this project, required potable water is supplied through the existing municipality water network, while drinking water is supplied by bottled water. Generated domestic wastewater is stored in septic tank and discharged to the TWSA wastewater treatment plant. No industrial wastewater generation takes places for this project.<br><br>On the other hand, Sarp Creek passes through the project area, while Seymen Creek and its catchment area, which was defined within the Physical Baseline, is located 500 m away from the project area. Therefore, any spill that may occur can pollute both surface waters and groundwater.<br><br>Considering the local extent and intensity, the expected cumulative impact of this project will be **Low** in terms of both Surface Waters and Groundwater. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |
| Sludge Drying Plant | Within the scope of this project, required potable and drinking water is supplied from existing municipality water network and through purchasing from the market, respectively. Domestic wastewater that will be generated during the construction phase of the project will be collected in a sealed septic tank and will be disposed of by being drawn with licensed vacuum trucks at regular intervals and given to the TWSA's wastewater treatment plant. Industrial wastewater, both inside and around the facility, will be collected through collection channels and stored in a 20-ton underground, sealed blind well outside the plant, where vehicle washing water is also collected, and will be sent to licensed companies. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | On the other hand, as this plant is around 750 m east of the Değirmen Creek and in its catchment area, which has been defined within the Physical Baseline, any spill that may occur can pollute both surface waters and groundwater.<br><br>Considering the local extent and intensity, the expected cumulative impact of this project will be **Low** in terms of both Surface Waters and Groundwater. | | |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The drinking water requirement for the personnel will be met by purchasing as in the current situation. The need for utility water will be supplied from the groundwater wells of the enterprise, which are currently in use, as in the current situation.<br><br>Groundwater usage from wells could change the groundwater flow regime. However, considering the distance to the Project Area and associated facilities, the expected cumulative impact of this project will be **Low** in terms of Hydrogeology and Groundwater Resources.<br><br>Domestic wastewater generated by the personnel of the currently operating plant is treated in the domestic wastewater treatment plant with a capacity of 192 $m^3$/day and discharged to the receiving environment. The amount of domestic wastewater that will be generated as a result of the increased number of personnel during the construction phase of the planned project will exceed the capacity of the existing wastewater treatment plant. For this reason, according to the planned project EIA, it is committed that before starting the construction works within the scope of the project, necessary applications will be made to increase the capacity of the domestic wastewater treatment plant and permits will be obtained. However, this project is outside the catchment areas defined within the scope of the physical baseline, and any pollutants that will leak to the surface waters will be discharged directly into the Marmara Sea.<br><br>Therefore, this project will be **Out of Scope** for the expected cumulative impact in terms of Hydrology and Surface Waters. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (Hydrogeology)**<br>**Out of Scope (Hydrology)** |
| **Soil Quality** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Considering that the nature of the planned project has the adverse impacts of a big infrastructure project, there is a potential for cumulative impacts present at the construction phase in relation to the increased soil contamination risk as a result of accidental spills.<br><br>However, considering the limited overlap of two projects in terms of soil impact AoI, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.3. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | According to the planned project EIA, there is no historical soil pollution in the area where the project activities are planned. It is committed that necessary measures will be taken in order to prevent soil pollution caused by the planned activity, and the topsoil removed during the land preparation phase will be stored appropriately. In addition, appropriate storage conditions are committed to be provided for the wastes that may occur in the field, and soil pollution will not be allowed. As written in the EIA Report, in the project area, 2872 Environment Law and all the provisions of the legislation issued pursuant to this law will be complied with.<br><br>The planned project is located approximately 3,900 m away from the nearest project component. Due to the distance, it is not expected that this project will have any adverse impact on soil quality within the Project AoI.<br><br>Therefore, this Project's contribution to the cumulative impact on soil quality will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.3. | **Negligible** |
| Port Capacity Increase | The planned project area is located approximately 4,800 m away from the nearest project component. Due to the distance, it is not expected that this project will have any adverse impact on soil quality within the Project AoI.<br><br>Therefore, this Project's contribution to the cumulative impact on soil quality will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.3. | **Negligible** |
| Wind Power Plant | The planned project area is located approximately 1,300 m away from the nearest project component. Due to the distance, it is not expected that this project will have any adverse impact on soil quality within the Project AoI.<br><br>Therefore, this Project's contribution to the cumulative impact on soil quality will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.3. | **Negligible** |
| Sludge Drying Plant | The planned project area is located approximately 2,800 m away from the nearest project component. Due to the distance, it is not expected that this project will have any adverse impact on soil quality within the Project AoI.<br><br>Therefore, this Project's contribution to the cumulative impact on soil quality will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.3. | **Negligible** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| Steel Mill and Rolling Mill Facilities Capacity Increase | According to the planned project EIA, all necessary measures will be taken to prevent soil pollution at its source at every stage of the activities to be carried out within the scope of the planned project, and all issues specified in the Environmental Law No. 2872 and the Regulation on Control of Soil Pollution and Point Source Contaminated Sites will be followed.<br><br>The planned project area is located approximately 3,000 m away from the nearest project component. Due to the distance, it is not expected that this project will not have any adverse impact on soil quality within the Project AoI.<br><br>Therefore, this Project's contribution to the cumulative impact on soil quality will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.3. | **Negligible** |
| **Air Quality** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Due to the nature of this project being similar to the Kınalı-Malkara Project (a major infrastructure project), similar adverse impacts are likely to be experienced. However, existing baseline air quality levels which were also used in the Project air quality models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>On the other hand, ÇOK A.Ş. has developed Environmental Management Plan for the Malkara Çanakkale Motorway Project which includes mitigation measures and monitoring activities regarding to air quality.<br><br>Therefore, expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | The planned facility area is located approximately 3,900 m away from the nearest project component. Due to the distance, it is not expected that this project will have any adverse impact on air quality within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Negligible** |
| Port Capacity Increase | The planned facility area is located approximately 4,800 m away from the nearest project component. Due to the distance, it is not expected that this project will have any adverse impact on air quality within the Project AoI.<br><br>On the other hand, existing baseline air quality levels which were also used in the Project air quality models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Negligible** |
| Wind Power Plant | According to the project EIA report, maximum emission rate from construction activities in the worst-case scenario was calculated as 0.85 kg/hr which is below the limit value of 1 kg/hr.<br><br>On the other hand, existing baseline air quality levels which were also used in the Project air quality models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>Considering all mitigation measures and commitments specified in the EIA and distance to the Kınalı Malkara Motorway Project, which is 1,300 m, the expected cumulative impact will be **Low.** | No additional measures are required other than the ones specified in Section 7.1.6. | **Low** |
| Sludge Drying Plant | According to the project EIA report, maximum emission rate from construction activities in the worst-case scenario was calculated as 0.485 kg/hr which is below the limit value of 1 kg/hr.<br><br>Considering all mitigation measures and commitments specified in the EIA and distance to the Kınalı Malkara Motorway Project, which is 2,800 m, the expected cumulative impact will be **Low.** | No additional measures are required other than the ones specified in Section 7.1.6. | **Low** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on air quality within the Project AoI.<br><br>On the other hand, existing baseline air quality levels which were also used in the Project air quality models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Negligible** |
| **Noise** | | | |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Due to the nature of this project being similar to the Kınalı-Malkara Project (a major infrastructure project), similar adverse impacts are likely to be experienced. However, existing baseline noise levels; which were also used in the Project noise models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>On the other hand, ÇOK A.Ş. has developed Environmental Management Plan for the Malkara Çanakkale Motorway Project which includes mitigation measures and monitoring activities regarding to noise.<br><br>Therefore, expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.9. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | According to EIA report, the planned project will not have a construction phase. The closest settlement to the planned project area is Karansıllı Neighbourhood, which is 1,161 m away, and the noise value to be generated by Project activities at this distance has been calculated as 34.54 dBA. Due to the distance, it is not expected that this project will have any adverse impact on noise within the Project AoI.<br><br>Considering all mitigation measures and commitments specified in the EIA and distance to the Kınalı Malkara Motorway Project, which is 3,900 m, the expected cumulative impact will be **Negligible.** | No additional measures are required other than the ones specified in Section 7.1.9. | **Negligible** |
| Port Capacity Increase | According to the planned project EIA, the noise level that will occur during the construction of the marine structures to be realized within the scope of the project decreases to 62.80 dBA at a distance of 150 m. In addition, the planned facility area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on noise within the Project AoI.<br><br>On the other hand, existing baseline noise levels which were also used in the Project noise models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>Therefore, the expected cumulative impact will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.9. | **Negligible** |
| Wind Power Plant | According to EIA report, noise emission calculations were conducted for the operation phase of the project. According to the calculations, the noise levels at the closest sensitive receptor, which is Balabanlı Neighbourhood located at 1,210 m away, was determined as 45 dBa.<br><br>On the other hand, existing baseline noise levels, which were also used in the Project noise models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>Considering all mitigation measures and commitments specified in the EIA and distance to the Kınalı Malkara Motorway Project, which is 1,300 m, the expected cumulative impact will be **Low.** | No additional measures are required other than the ones specified in Section 7.1.9. | **Low** |
| Sludge Drying Plant | According to the EIA of the planned project, the sound pressure level to be generated within the scope of the project construction is calculated as 70.00 dBA at a distance of 63 meters. In addition, the planned facility area is located approximately 2,800 m away from the project.<br><br>Therefore, the expected cumulative impact will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.9. | **Low** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on noise within the Project AoI.<br><br>On the other hand, existing baseline noise levels which were also used in the Project noise models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.9. | **Negligible** |
| **Vibration** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Due to the nature of this project being similar to the Kınalı Malkara Motorway Project (a major infrastructure project), similar adverse impacts are likely to be experienced.<br><br>On the other hand, ÇOK A.Ş. has developed Environmental Management Plan for the Malkara-Çanakkale Motorway Project which includes mitigation measures and monitoring activities regarding to vibration.<br><br>Therefore, expected cumulative impact due to these two projects will be **Low.** | No additional measures are required other than the ones specified in Section 7.1.10. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | The plant area is located approximately 3,900 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Therefore, the Project's contribution to the expected cumulative impact will be **Negligible**. | | |
| Port Capacity Increase | The planned project area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the Project's contribution to the expected cumulative impact will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| Wind Power Plant | The project area is located approximately 1,300 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the Project's contribution to the expected cumulative impact will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| Sludge Drying Plant | The plant area is located approximately 2,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the Project's contribution to the expected cumulative impact will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| **Traffic** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Kınalı Malkara Motorway Project is the continuation of Malkara Çanakkale Project. In addition, the Malkara Çanakkale project is in the operation phase.<br><br>On the other hand, ÇOK A.Ş. has developed Transport Control and Site Access Procedure for the Malkara Çanakkale Motorway project which includes mitigation measures and monitoring activities regarding to traffic management.<br><br>Therefore, the expected cumulative impact of will be **Negligible** as the construction works are temporary. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| 2A Group Quarry and Crushing and Screening Plant | According to the EIA of the planned project, the additional traffic load arising from the project is 0.315%.<br><br>On the other hand, the planned facility area is located approximately 3,900 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on traffic within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| Port Capacity Increase | According to the EIA of the planned project, during the construction phase, there will be an increase of approximately 0.15% in the total vehicle load in the project area and its surroundings. Since the transportation will be made by trucks, an increase of approximately 3.1% will be seen in the heavy vehicle (truck) load on the highway with an average of 1,342 units/day of heavy vehicle (truck) load.<br><br>On the other hand, the planned facility area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on traffic within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| Wind Power Plant | According to the EIA of the project, the additional traffic load arising from the project is estimated as 0.045%.<br><br>On the other hand, the project area is located approximately 1,300 m away from the project.<br><br>Therefore, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Low** |
| Sludge Drying Plant | For this project, in case the facility works at full capacity, since 30 tons capacity transportation trucks will be used for transportation, approximately 7 trucks (192 tons/day ÷ 30 tons/truck) for the transport of the sludge to be processed, and 1 truck (3.84 tons/day÷ 30 tons/truck), a total of 8 trucks will participate in the traffic. | No additional measures are required other than the ones specified in Section 7.1.11. | **Low** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Considering that 885 vehicles will be on state roads on daily basis on the worst-case scenario due to the construction activities of the Kınalı Malkara Motorway Project, expected cumulative impact for this project will be **Low**. | | |
| Steel Mill and Rolling Mill Facilities Capacity Increase | According to the EIA of the planned project, the additional traffic load arising from the project is 1.18%.<br><br>On the other hand, the planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| **Visual Aesthetics** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Considering that the nature of the motorway project has the adverse impact of a big infrastructure project, and Kınalı Malkara Motorway Project is the continuation of Malkara-Çanakkale project, there is a potential for cumulative impacts present at the construction phase of the Project in relation to the decreased visual aesthetics.<br><br>On the other hand, Malkara Çanakkale project is in the operation phase.<br><br>Therefore, expected cumulative impact due to these two projects will be **Medium.** | No additional measures are required other than the ones specified in Section 7.1.12. | **Medium** |
| 2A Group Quarry and Crushing and Screening Plant | The plant area is located approximately 3,900 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |
| Port Capacity Increase | The planned project area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |
| Wind Power Plant | Visual impacts associated with wind energy projects typically concern the installed and operational turbines themselves. The location of the project area and the level of contrast between the existing environmental conditions and turbine structures plan an important role on the level of visual impact.<br><br>Considering that the project area is located 1,300 m away from the project, it is expected that this project will have low impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Low** |
| Sludge Drying Plant | The plant area is located approximately 2,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |
| **Biodiversity** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Considering that the nature of the planned project has the adverse impact of a big infrastructure project, and the spatial overlap of the two projects, there is a potential for cumulative impacts present at the construction phase in relation to the biodiversity (vegetation and topsoil removal, increase in vehicular traffic, etc.).<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | Considering that the nature of the planned project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | | |
| Port Capacity Increase | Considering that the nature of the planned project has the adverse impact of a big infrastructure project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced.<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| Wind Power Plant | Considering that the nature of the planned project has the adverse impact of a big infrastructure project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced.<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Medium**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| Sludge Drying Plant | Considering that the nature of the planned project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced.<br><br>However, in accordance with the aerial view of this project area, the land is already disturbed and turned into modified habitat.<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | Considering that area of this project is located within the factory area which takes place in already disturbed land and this project will be realized in an existing closed building, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.2. | **Negligible** |
| **Social** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Considering that the nature of the planned project has the adverse impact of a big infrastructure project, and the spatial overlap of the two projects, there is a potential for cumulative impacts present at the construction phase in relation to the resettlement and land acquisition, community health and safety, infrastructure and services, traffic, and labour influx.<br><br>On the other hand, ÇOK A.Ş. has developed Stakeholder Engagement Plan and Grievance Mechanism Procedure, Guide to Land Acquisition and Compensation (GLAC), Community Health, Safety and Security Procedure, Local Content Procedure, and Transport Control and Site Access Procedure, for the Malkara Çanakkale Motorway Project.<br><br>Therefore, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9, 7.1.11 and 7.3. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | According to EIA report, the planned project will not have a construction phase. As part of the project, 11 people will be employed during the operation phase of the planned facility.<br><br>As stated before, air quality, noise and traffic impacts of this project are considered as negligible.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9, 7.1.11 and 7.3. | **Low** |
| Port Capacity Increase | According to the planned project EIA report, 30 people will be employed for the construction phase of the project.<br><br>As stated before, air quality, noise and traffic impacts of this project are considered as negligible.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9, 7.1.11 and 7.3. | **Low** |
| Wind Power Plant | According to the project EIA report, 40 people will be employed for the construction phase of the project.<br><br>As stated before, air quality, noise and traffic impacts of this project are considered as low.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9, 7.1.11 and 7.3. | **Low** |
| Sludge Drying Plant | According to the planned project EIA report, 5 people will be employed for the operation phase of the project. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9, 7.1.11 and 7.3. | **Low** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | As stated before, air quality, noise and traffic impacts of this project are considered as low.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | | |
| Steel Mill and Rolling Mill Facilities Capacity Increase | In addition to the 820 people working at the existing facility in the project area, it is planned to employ 250 more personnel during the construction phase of the project.<br><br>As stated before, air quality, noise and traffic impacts of this project are considered as negligible.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9, 7.1.11 and 7.3. | **Low** |

**Table 306: Cumulative Impact Assessment for the Operation Phase of the Project**

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| **Water Resources** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | The potential for cumulative impacts is present at the operation phase in relation to the increased pollution risk to surface water bodies as a result of accidental spills, sedimentation and overland flow / discharge.<br><br>However, considering the limited overlap of two projects in terms of water impact AoI, the expected cumulative impact of these projects will be **Low** in terms of both Hydrology and Hydrogeology. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |
| 2A Group Quarry and Crushing and Screening Plant | Within the scope of this project, required potable and drinking water is supplied from the existing municipality water network with water tanker. Generated domestic wastewater is stored in septic tank and discharged to the TWSA (Tekirdag Water and Sewerage Administration General Directorate (TESKİ in Turkish)) wastewater treatment plant. No industrial wastewater generation takes places for this project.<br><br>On the other hand, as this plant is 2 km away from Bent Creek and in its catchment area, which was defined within the Physical Baseline, any spill that may occur can pollute both surface waters and groundwater.<br><br>Considering the local extent and intensity, the expected cumulative impact of this project will be **Low** in terms of both Surface Waters and Groundwater. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |
| Port Capacity Increase | Within the planned project, required potable and drinking water is supplied from the existing municipality water network. Generated domestic wastewater is discharged to the existing municipality sewage network. On the other hand, generated industrial wastewaters from the vessels within the planned project are treated in the wastewater treatment plant of the project in accordance with the Turkish regulatory requirements and discharged to the sewage network accordingly.<br><br>There is a potential for cumulative impacts present at the operation phase in relation to the increased pollution risk to surface and groundwater bodies as a result of accidental spills, sedimentation and overland flow/discharge.<br><br>However, this port, 4,800m away from the Project Area, is at the downstream of important surface and groundwater bodies in the vicinity of the project area at lower elevations. Moreover, this port is not in catchments related to the Project defined in the Physical Baseline. For this reason, any spill that may occur will directly leak to the sea instead of water resources in the AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Out of Scope** in terms of both Surface Waters and Groundwater. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Out of Scope (in terms of both Hydrology and Hydrogeology)** |
| Wind Power Plant | Within the scope of this project, required potable water is supplied through the existing municipality water network, while drinking water is supplied by bottled water. Generated domestic wastewater is stored in septic tank and discharged to the TWSA wastewater treatment plant. No industrial wastewater generation takes places for this project.<br><br>On the other hand, Sarp Creek passes through the project area, while Seymen Creek and its catchment area which was defined within the Physical Baseline is located 500 m away from the project area. Therefore, any spill that may occur can pollute both surface waters and groundwater.<br><br>Considering the local extent and intensity, the expected cumulative impact of this project will be **Low** in terms of both Surface Waters and Groundwater. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| Sludge Drying Plant | Within the scope of this project, required potable and drinking water is supplied from existing municipality water network and through purchasing from the market, respectively. Domestic wastewater that will be generated during the construction phase of the project will be collected in a sealed septic tank and will be disposed of by being drawn with licensed vacuum trucks at regular intervals and given to the TWSA's wastewater treatment plant. Industrial wastewater, both inside and around the facility, will be collected through collection channels and stored in a 20-ton underground, sealed blind well outside the plant, where vehicle washing water is also collected, and will be sent to licensed companies.<br><br>On the other hand, as this plant is around 750 m east of the Değirmen Creek and in its catchment area, which has been defined within the Physical Baseline, any spill that may occur can pollute both surface waters and groundwater.<br><br>Considering the local extent and intensity, the expected cumulative impact of this project will be **Low** in terms of both Surface Waters and Groundwater. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (in terms of both Hydrology and Hydrogeology)** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The drinking water requirement for the personnel will be met by purchasing as in the current situation. The need for utility water will be supplied from the groundwater wells of the enterprise, which are currently in use, as in the current situation.<br><br>Groundwater usage from wells could change the groundwater flow regime. However, considering the distance to the Project Area and associated facilities, the expected cumulative impact of this project will be **Low in terms of** Hydrogeology and Groundwater Resources.<br><br>Domestic wastewater generated by the personnel of the currently operating plant is treated in the domestic wastewater treatment plant with a capacity of 192 $m^3$/day and discharged to the receiving environment. The amount of domestic wastewater that will be generated as a result of the increased number of personnel during the construction phase of the planned project will exceed the capacity of the existing wastewater treatment plant. For this reason, according to the planned project EIA, it is committed that before starting the construction works within the scope of the project, necessary applications will be made to increase the capacity of the domestic wastewater treatment plant and permits will be obtained. However, this project is outside the catchment areas defined within the scope of the physical baseline, and any pollutants that will leak to the surface waters will be discharged directly into the Marmara Sea.<br><br>Therefore, this project will be **Out of Scope** for the expected cumulative impact on Hydrology and Surface Waters. | No additional measures are required other than the ones specified in Section 7.1.4 and Section 7.1.5. | **Low (Hydrogeology)**<br><br>**Out of Scope (Hydrology)** |
| **Air Quality** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Potential impacts on air quality during the operational phase of the Kınalı Malkara Motorway Project are mainly caused by the vehicle that will pass through the Motorway.<br><br>On the other hand, ÇOK A.Ş. has developed Environmental Management Plan for the Malkara Çanakkale Motorway Project which includes mitigation measures and monitoring activities regarding to air quality.<br><br>Air quality modelling for this ESIA has already been done cumulatively and the impact is found to be **Medium** for the operational phase. | No additional measures are required other than the ones specified in Section 7.1.6. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | The planned facility area is located approximately 3,900 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on air quality within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Negligible** |
| Port Capacity Increase | The planned facility area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on air quality within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Negligible** |
| Wind Power Plant | Considering the nature of this project, no air emissions will take place during the operation phase. Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Negligible** |
| Sludge Drying Plant | According to the project EIA report, maximum emission rate from operational activities in the worst-case scenario were calculated well below the regulatory limit values. | No additional measures are required other than the ones specified in Section 7.1.6. | **Low** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Considering all mitigation measures and commitments specified in the EIA and distance to the Kınalı Malkara Motorway Project, which is 2,800 m, the expected cumulative impact will be **Low.** | | |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on air quality within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.6. | **Negligible** |
| **Noise** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Potential impacts from noise during the operational phase of the Kınalı Malkara Motorway Project are mainly caused by the vehicle that will pass through the Motorway. On the other hand, ÇOK A.Ş. has developed Environmental Management Plan for the Malkara Çanakkale Motorway Project which includes mitigation measures and monitoring activities regarding to noise.<br><br>Noise modelling for this ESIA has already been done cumulatively and the impact is found to be **Medium** for the operational phase. | No additional measures are required other than the ones specified in Section 7.1.9. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | The closest settlement to the planned project area is Karansıllı Neighbourhood, which is 1,161 m away, and the noise value to be generated by Project activities at this distance has been calculated as 34.54 dBA.<br><br>Considering all mitigation measures and commitments specified in the EIA and distance to the Kınalı Malkara Motorway Project which is 3,900 m, the expected cumulative impact will be **Negligible.** | No additional measures are required other than the ones specified in Section 7.1.9. | **Negligible** |
| Port Capacity Increase | The planned facility area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on noise within the Project AoI during the operation phase.<br><br>Therefore, the expected cumulative impact will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.9. | **Negligible** |
| Wind Power Plant | According to EIA report, noise emission calculations were conducted for the operation phase of the project. According to the calculations, the noise levels at the closest sensitive receptor which is Balabanlı Neighbourhood located at 1,210 m away, was determined as 45 dBa.<br><br>On the other hand, existing baseline noise levels which were also used in the Project noise models, show the cumulative impacts of the projects within the Project AoI in any case.<br><br>Considering all mitigation measures and commitments specified in the EIA and distance to the Kınalı Malkara Motorway Project, which is 1,300 m the expected cumulative impact will be **Low.** | No additional measures are required other than the ones specified in Section 7.1.9. | **Low** |
| Sludge Drying Plant | Considering that this project will be realized in an existing closed building, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.9. | **Negligible** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | Considering that this project will be realized in an existing closed building, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.9. | **Negligible** |
| **Vibration** | | | |
| Malkara-Çanakkale Motorway including 1915 Çanakkale Bridge | During the operation phase of the Kınalı Malkara Motorway Project, the only potential vibration source will be due to vehicle movement throughout the Motorway.<br><br>On the other hand, ÇOK A.Ş. has developed Environmental Management Plan for the Malkara-Çanakkale Motorway Project which includes mitigation measures and monitoring activities regarding to vibration.<br><br>Therefore, expected cumulative impact due to these two projects will be **Low.** | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| 2A Group Quarry and Crushing and Screening Plant | The plant area is located approximately 3,900 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the Project's contribution to the expected cumulative impact will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| Port Capacity Increase | The planned project area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Therefore, the Project's contribution to the expected cumulative impact will be **Negligible**. | | |
| Wind Power Plant | The project area is located approximately 1,300 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the Project's contribution to the expected cumulative impact will be **Negligible.** | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| Sludge Drying Plant | The plant area is located approximately 2,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the Project's contribution to the expected cumulative impact will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on vibration within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.10. | **Negligible** |
| **Traffic** | | | |
| Malkara Çanakkale Motorway including 1915 Çanakkale Bridge | Kınalı Malkara Motorway Project is the continuation of Malkara Çanakkale Project. In addition, the Malkara Çanakkale project is in the operation phase.<br><br>During operation phase, the integration of the Malkara-Çanakkale Motorway with the Kınalı-Malkara Motorway may result in increased traffic volumes at interchanges. On the other hand, the operation of the two Projects will provide more efficient route for commuters, freight transport, and tourism.<br><br>Therefore, the expected cumulative impact of will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| 2A Group Quarry and Crushing and Screening Plant | According to the EIA of the planned project, the additional traffic load arising from the project is 0.315%.It is a possibility that, the construction phase of the 2A Group Quarry and Crushing and Screening Plant may be during the operation phase of the Kınalı Malkara Project.<br><br>On the other hand, the planned facility area is located approximately 3,900 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on traffic within the Project AoI. Moreover, during operation of the Kınalı Malkara Project it is expected that transportation will become easier due to motorway and intercity freight traffic is expected to decrease which will create a positive impact on traffic load.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| Port Capacity Increase | According to the EIA of the planned project, during the construction phase, there will be an increase of approximately 0.15% in the total vehicle load in the project area and its surroundings. Since the transportation will be made by trucks, an increase of approximately 3.1% will be seen in the heavy vehicle (truck) load on the highway with an average of 1,342 units/day of heavy vehicle (truck) load. It is a possibility that, the construction phase of the Port Capacity Increase Project will continue during the operation phase of the Kınalı Malkara Project.<br><br>On the other hand, the planned facility area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on traffic within the Project AoI. Moreover, during operation of the Kınalı Malkara Project it is expected that transportation will become easier due to motorway and intercity freight traffic is expected to decrease which will create a positive impact on traffic load.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| Wind Power Plant | According to the EIA of the project, the additional traffic load arising from the project is estimated as 0.045%. It is a possibility that, the construction phase of the Wind Power Plant will continue during the operation phase of the Kınalı Malkara Project.<br><br>The project area is located approximately 1,300 m away from the project. However, during operation of the Kınalı Malkara Project it is expected that transportation will become easier due to motorway and intercity freight traffic is expected to decrease which will create a positive impact on traffic load. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Therefore, the expected cumulative impact of this project will be **Negligible**. | | |
| Sludge Drying Plant | For this project, in case the facility works at full capacity, since 30 tons capacity transportation trucks will be used for transportation, approximately 7 trucks (192 tons/day ÷ 30 tons/truck) for the transport of the sludge to be processed, and 1 truck (3.84 tons/day) for the transportation of the coal to be used in the process. ÷ 30 tons/truck), a total of 8 trucks will participate in the traffic. It is a possibility that, the construction phase of the Sludge Drying Plant may be during the operation phase of the Kınalı Malkara Project.<br><br>The project area is located approximately 2,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on traffic within the Project AoI. Moreover, during operation of the Kınalı Malkara Project it is expected that transportation will become easier due to motorway and intercity freight traffic is expected to decrease which will create a positive impact on traffic load.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | According to the EIA of the planned project, the additional traffic load arising from the project is 1.18%. It is a possibility that, the construction phase of the Steel Mill and Rolling Mill Facilities Capacity Increase Project may be during the operation phase of the Kınalı Malkara Project.<br><br>On the other hand, the planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on traffic within the Project AoI. Moreover, during operation of the Kınalı Malkara Project it is expected that transportation will become easier due to motorway and intercity freight traffic is expected to decrease which will create a positive impact on traffic load.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.11. | **Negligible** |
| **Visual Aesthetics** | | | |
| Malkara-Çanakkale Motorway including 1915 Çanakkale Bridge | Considering that the nature of the motorway project has the adverse impact of a big infrastructure project, and Kınalı Malkara Motorway Project is the continuation of Malkara-Çanakkale project, there is a potential for cumulative impacts present at the operation phase of the Project in relation to the decreased visual aesthetics.<br><br>Therefore, the expected cumulative impact of this project will be **Medium.** | No additional measures are required other than the ones specified in Section 7.1.12. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | The plant area is located approximately 3,900 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |
| Port Capacity Increase | The planned project area is located approximately 4,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |
| Wind Power Plant | Visual impacts associated with wind energy projects typically concern the installed and operational turbines themselves. The location of the project area and the level of contrast between the existing environmental conditions and turbine structures plan an important role on the level of visual impact.<br><br>Considering that the project area is located 1,300 m away from the project, it is expected that this project will have low impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Low** |
| Sludge Drying Plant | The plant area is located approximately 2,800 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI.<br><br>Therefore, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | The planned facility area is located approximately 3,000 m away from the project. Due to the distance, it is not expected that this project will have any adverse impact on visual aesthetics within the Project AoI. | No additional measures are required other than the ones specified in Section 7.1.12. | **Negligible** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Therefore, the expected cumulative impact of this project will be **Negligible**. | | |
| **Biodiversity** | | | |
| Malkara-Çanakkale Motorway including 1915 Çanakkale Bridge | There is a spatial overlap between this project and AoI of the Project. Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | Considering that the nature of the planned project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced.<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| Port Capacity Increase | Considering that the nature of the planned project has the adverse impact of a big infrastructure project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced.<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| Wind Power Plant | Considering that the nature of the planned project has the adverse impact of a big infrastructure project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced.<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Medium**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| Sludge Drying Plant | Considering that the nature of the planned project, similar adverse impacts (increase in vehicular traffic, etc.) on biodiversity are likely to be experienced.<br><br>However, in accordance with the aerial view of this project area, the land is already disturbed and turned into modified habitat.<br><br>Considering the limited overlap of two projects in terms of biodiversity, the expected cumulative impact of these projects will be **Low**. | No additional measures are required other than the ones specified in Section 7.2. | **Low** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | Considering that area of this project is located within the factory area which takes place in already disturbed land and this project will be realized in an existing closed building, the expected cumulative impact of this project will be **Negligible**. | No additional measures are required other than the ones specified in Section 7.2. | **Negligible** |
| **Social** | | | |
| Malkara-Çanakkale Motorway including 1915 Çanakkale Bridge | During the operation periods, cumulative **positive** impacts are expected on the continuation of the current economic activities of the region.<br><br>As for the community health and safety issues, since warning signs will be placed where necessary, the cumulative impact on community health and safety will also be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9, 7.1.11 and 7.3. | **Low** |
| 2A Group Quarry and Crushing and Screening Plant | According to EIA report, 11 people will be employed during the operation phase of the planned facility.<br><br>As stated before, air quality and noise impacts of this project are considered as negligible.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9 and 7.3. | **Low** |
| Port Capacity Increase | According to the planned project EIA, 200 people will be employed for the operation phase of the project.<br><br>As stated before, air quality and noise impacts of this project are considered as negligible.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9 and 7.3. | **Low** |
| Wind Power Plant | According to the planned project EIA, 10 people will be employed for the operation phase of the project.<br><br>As stated before, air quality impacts of this project are considered as negligible, while noise impacts are considered as low. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9 and 7.3. | **Low** |

| 3rd Party Facilities | Assessment of Cumulative Impact with the Kınalı Malkara Motorway Project | Mitigation Measures | Residual Cumulative Impact |
|---|---|---|---|
| | Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | | |
| Sludge Drying Plant | According to the planned project EIA, 20 people will be employed for the operation phase of the project.<br><br>As stated before, air quality impacts of this project are considered as low, while noise impacts are considered as negligible.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9 and 7.3. | **Low** |
| Steel Mill and Rolling Mill Facilities Capacity Increase | In addition to the 820 people working at the existing facility in the project area, 850 more personnel will be employed with the realization of the planned project.<br><br>As stated before, air quality and noise impacts of this project are considered as negligible.<br><br>Based on that, considering the worst-case scenario, the expected cumulative impact of this project will be **Low**. | No additional measures are required other than the ones specified in Section 7.1.6, 7.1.9 and 7.3. | **Low** |

## 8.6 Step 6 – Management of Cumulative Impacts – Design and Implementation

The management approach to implementation needs to be adaptive, monitoring both the impacts and the effectiveness of management approaches and adjusting the management to ensure avoidance of unacceptable cumulative impacts. As with management of impacts identified in ESIA, this works best when management of cumulative impacts is integrated into company business plans and strategies.

The definition of a detailed mitigation strategy for cumulative impacts of the projects would require a set of information and data on the various projects involved that is not currently available, as well as extending the study area significantly beyond the boundaries defined for the Project ESIA.

Thus, preparation of mitigation strategy for cumulative impacts would require cooperation and coordination among the Project owners. Furthermore, the implementation would also require the cooperation, and the consent as applicable, of several related authorities that govern the various VECs, such as the departments of forestry, wildlife, and water resources management. The effectiveness of this coordination/cooperation cannot be guaranteed at this stage and will depend on the mutual preparedness of the companies other than ÇOK A.Ş/EPC Contractor and also the related authorities to cooperate on this issue during the future phases of these projects.

According to this CIA study, cumulative impacts from the Project and other projects were generally found to be of low intensity or negligible. However, below considerations would be needed to effectively manage the cumulative impacts:

- The management measures needed to prevent cumulative impacts will depend on both the context in which the development impacts occur (i.e., the impacts from other projects and natural drivers that affect the VECs) and the characteristics of the development's impacts. Since cumulative impacts typically result from the actions of multiple stakeholders, the responsibility for their management is collective, requiring individual actions to eliminate or minimize individual development's contributions. For the management of cumulative impacts, multiple stakeholders need to be involved in a collective responsibility to eliminate or minimize the impacts. Therefore, ÇOK A.Ş/EPC Contractor will conduct a close engagement and consultation activities with the projects mentioned in this CIA and government agencies, if necessary. For this, it is recommended for ÇOK A.Ş/EPC Contractor to prepare a specific Stakeholder List for CIA.
- ÇOK A.Ş/ EPC Contractor will ensure that all mitigation measures given in this ESIA, and all management plans are implemented. Since the proposed Project will be one of the largest projects in the region, the specific mitigation and monitoring measures described for each component in Chapter 7 of this ESIA report, will be important to manage the cumulative impacts. To ensure this, the monitoring programs and KPIs provided in the related ESIA chapters will be followed by ÇOK A.Ş/EPC Contractor.
- In case of any grievances about the cumulative impact, ÇOK A.Ş/EPC Contractor will inform the other project owners and joint actions will be taken.
- ÇOK A.Ş/EPC Contractor will conduct close engagement and consultation activities with the projects mentioned in this CIA.
- Collaborative planning/process for protection and enhancement of VECs

# 9.0 ESMS INCLUDING ESMP

## 9.1 Environmental and Social Management System Structure

An Environmental and Social Management System (ESMS) will ensure that the Project:

- complies with all applicable Turkish legislation as well as Equator Principles, and IFC Standards and Guidelines;
- implements Good International Industry Practices (GIIP) to minimize potential environmental and social impacts during the construction, operation and decommissioning phases;
- is executed in compliance with the commitments addressed in the ESIA for the minimization of potential environmental and social impacts;
- works in accordance with high standards of safety;
- cares for the protection of own employees and public;
- promotes its policies through training, supervision, regular reviews and consultation;
- generate local socio-economic benefits by using local and regional labour forces;
- engages and communicates with the local community and other stakeholders through a stakeholder engagement program.

The ESMS addresses more in detail the following environmental and social aspects:

- Environmental aspects
- Stakeholder management and social aspects
- Occupational Health and Safety, Labour Issues and community Health & Safety aspects

The ESMS included here is intended to describe the framework for the general management issues.

The Project does not have a project specific ESMS including associated facilities. However, ÇOK A.Ş. has an ESMS for Malkara-Çanakkale Motorway (including the 1915 Çanakkale Bridge) which is a segment of the Kınalı-Balıkesir Motorway. These ESMS elements will be revised and be project-specific and will reflect the latest Turkish and international practice and lessons learned from implementation of Malkara-Çanakkale Motorway. ESMS for Malkara-Çanakkale Motorway (including the 1915 Çanakkale Bridge) covers the followings:

- Health, Safety, Security, Social and Environment Policy (ÇOK A.Ş.)
- OHS, Environmental, Social Policy (ÇOK A.Ş.)
- Employment Policy Document (ÇOK A.Ş.)
- Stakeholder Engagement and Grievance Mechanism (GRM )Procedure
- Environmental Management Plan
- Subcontractor Management Plan
- Supply Chain Management Plan
- Quarries and Associated Facilities Management Plan
- Control of Substances Hazardous to Health Procedure

- Water Crossing Plan
- Soil Erosion, Reinstatement and Landscape Management Plan
- Cultural Heritage Management Plan
- Local Content Procedure
- Community Health, Safety and Security Procedure
- Occupational Health and Safety Plan
- Transport Control and Site Access Procedure
- Emergency Response Plan

The above-mentioned plans will be prepared for the construction and operation phases of the Project. The management plans prepared for the construction phase will be reviewed and updated as necessary for the operation phase.

The corporate level management system will be adapted to the Project and developed plans and procedures will be revised according to the Project Standards, updated and made Project specific. Below listed issues will be considered while updating the already existing ESMS of the ÇOK A.Ş.:

- Key Performance Indicators (KPIs) will be included in all plans and procedures.
- The top management will support the ESMS system and will have a commitment to the implementation of ESMS in policy statements and relevant documents.
- The ESMS will be announced to all relevant parties and awareness on the implementation of ESMS will be targeted.
- The trainings with aim to implement ESMS will be performed regularly for all employees considering the new recruitments.
- Roles and responsibilities will be defined in each document and resources will be allocated to effective implementation of ESMS.
- Each document will present the actions planned to be carried out in the different Project phases and their schedule.

It should be ensured that adequate resources are allocated by the Project for the effective implementation of ESMS.

The ESMS will be further developed and adapted for the Project and will include details to describe the minimum requirements for the implementation of relevant management systems, including[234]:

- Policy
- Identification of Risks and Impacts
- Management Programs
- Organizational Capacity and Competency

[234] IFC, Environmental and Social Management System Implementation Handbook

- Emergency Preparedness and Response
- Stakeholder Engagement
- Internal Grievance Mechanism
- External Communications and Grievance Mechanisms
- Ongoing Reporting to Affected Communities

## 9.2 Overall Environmental and Social Management System

### 9.2.1 Policy

ÇOK A.Ş. has Health, Safety, Security, Social and Environment Policy and Employment Policy. ÇOK A.Ş. also has Environmental, Social Policy and OHS Policy. These policies will be reviewed and revised according to the Project Standards, updated, and made Project specific and will be adapted to the Project.

In addition to these polices, Human Rights Policy and Security Policy will be developed and implemented. All policies will be communicated with all stakeholders including the workers, subcontractors, suppliers, community members, etc. and will be reviewed and revises (when needed) periodically.

### 9.2.2 Identification of Risks and Impacts

In order to identify and manage the Project risks, a risk assessment study will be conducted at the beginning of the construction works and will be repeated at the beginning of each phase, in case of any changes and as per legally required intervals. The findings of this study will be taken into consideration and a detailed risk register will be prepared identifying the potential environmental, health and safety and social risks associated with the individual work items. This will be a living document and be updated during the course of the Project.

### 9.2.3 Management Programs

As part of the ESMS, the management strategies in the ESMS for Malkara-Çanakkale Motorway will be adapted in order to avoid, minimize and compensate with the risks and impacts identified in the Project.

The efficiency of the control measures established with the management plans will be verified against the objectives and targets set. The management plans will emphasize preventive and proactive actions, i.e., 1) try to avoid causing social or environmental damage; 2) if not possible, then minimize the impact; 3) if not possible, then compensate or offset the damage.

A Site HSE Manager for the Project will be appointed in the beginning of the pre-construction activities to supervise the implementation of overall environmental and social mitigation activities defined by the ESMS.

Additional, to the plans and procedures developed by ÇOK A.Ş. for Malkara-Çanakkale Motorway, ESMS should minimum include the below listed plan(s)/procedure(s)[235]. These plans will be prepared for the construction and operation phases of the Project. The management plans prepared for the construction phase will be reviewed and updated as necessary for the operation phase.

- Environmental and Social Management Plan
- Land Acquisition, Compensation and Resettlement Plan and/or Resettlement Action Plan
- Camp Site Management Plan (including Workers' Accommodation)

[235] The list produced considering that the plans and procedures developed by ÇOK A.Ş. for Malkara-Çanakkale Motorway will be revised and updated for the Project and will be project specific.

- Resourcing Plan
- Biodiversity Management Plan (BMP)
- Biodiversity Action Plan (BAP)
- Biodiversity Offset Management Plan (BOMP)
- Biodiversity Monitoring and Evaluation Plan
- Water and Wastewater Management Plan
- Waste Management Plan
- Soil and Topsoil Management Plan
- Air Quality and Greenhouse Gas Management Plan
- Noise and Vibration Management Plan
- Hazardous Materials Management Plan
- Resource Efficiency and Pollution Prevention Plan
- Water Quality Management Plan
- Groundwater Management Plan
- Cultural Heritage Management Plan (including Chance Find Procedure)
- Traffic Management Plan
- Security Management Plan
- Code of Conduct
- Emergency Response Plan
- Stakeholder Engagement Plan (including GRM)
- Human Resources Management Policy and Plan
- Local Employment Plan
- Labour Influx Management Procedure
- Worker Grievance Mechanism Procedure
- Worker Demobilisation Plan
- Livelihood Restoration Plan
- Gender-based Violence and Harassment Management Plan
- Severance Management Plan
- Change Management Procedure
- Drainage Management Plan
- Pesticide and Herbicide Management Plan

### 9.2.4 Organizational Capacity and Competency

An ESMS team will be established to take the responsibility of the implementation of the ESMS. The team will include experts form different fields such as environment, health and safety, operations or production, contracts and purchasing, human resources. At least, the following roles and responsibilities will be ensured in the Project.

The **Project Management** will ensure that:

- the Project will be executed in line with the Policy statements of the Project itself;
- the required resources are in place to implement the environmental and social mitigation measures identified in the ESIA.

**The HSE Manager** will supervise the overall environmental and social management activities associated with the Project at all phases of the Project. HSE Engineer(s) will be appointed in the beginning of pre-construction activities in order to ensure the effective implementation of the Project ESMS.

The role of the HSE Manager will be to:

- implement and administrate HSE Plans and Procedures applicable to the Project;
- supervise the implementation of the environmental and social mitigation measures identified in the ESIA;
- ensure the ESMS and the associated management plans and procedures are further developed and detailed during the course of the Project lifecycle;
- inspect worksite periodically to verify that the work is carried out in compliance with the ESMS requirements, with no violations of HSE requirements;
- coordinate with Community Liaison Officer to ensure the stakeholder engagement activities being performed in line with the stakeholders programme and the external grievances are recorded and addressed;
- Periodically assess the HSE performance of the Project through KPIs defined in management/monitoring plans and procedures.

Malkara-Çanakkale Motorway's **Community Liaison Officers (CLOs)** will be responsible for the Project. CLOs are responsible for stakeholder engagement and, managing and monitoring of the GRM.CLOs will supervise the overall implementation of the social management activities of the Project. CLOs will report to the Project Management and are responsible for the implementation and operation of the Stakeholder Engagement Plan (SEP) and Resettlement Action Plan (RAP) in this respect acts as an interface between the Project, contractors, subcontractors and other stakeholders. They will organize engagement activities described in SEP and RAP. The CLO is furthermore responsible for:

- ensuring that all social management and monitoring plans/procedures especially SEP is up to date and appropriate to the nature and scale of the Project;
- proposing to the management, if necessary, amendments and/or updates to the SEP and issuing revisions.

CLOs will have to be introduced to local people and the communication channels (including access to the GRM) be provided in case of adverse impacts to agricultural land or private assets.

Resourcing Plan will be developed for the Project to evaluate and outline the number and expertise of ESHS specialists needed during the construction phase, both within ÇOK A.Ş. and EPC contractor, as well as during the operations phase for ÇOK A.Ş. and any potential O&M contractor. This plan will ensure the Project can hire the necessary qualified specialists before construction begins and maintain the appropriate level of staffing

throughout the construction phase. Additionally, the Resourcing Plan should be reviewed regularly to ensure the required capacity and competency are sustained throughout the Project's lifecycle. The plan should also account for resources needed to develop and implement biodiversity management plans. It should support ongoing assessments of the resource levels required at each stage of the Project.

### 9.2.5 Emergency Preparedness and Response

Emergency Response Plan (ERP) will be prepared both for the construction phase and operation phases in accordance with the national and international requirements. The Plans will consider the potential emergencies that would impact the work force, nearby settlements, environment, and assets. Community health and safety issues related to emergency management will be included in these plans. ERP will be update and expanded as needed for implementation in the operation phase of the Project.

The ERP should outline management processes to address emergencies related to working practice and OHS concerns. In addition to OHS issues, the ERP should also cover scenarios involving natural hazards, equipment overturning, and the handling of hazardous materials. The ERP should identify all potential risks during both the construction and operational phases, assess their severity and impact, and implement appropriate mitigation measures to ensure preparedness and an effective response in case of emergencies. ERP should cover both community and workforce issues.

### 9.2.6 Stakeholder Engagement

#### *9.2.6.1 Stakeholder Engagement Plan*

Stakeholders are identified as any person, group, or organisation with a vested interest in the outcome of the Project. For the SEP, a stakeholder is defined as a key stakeholder when having a significant influence on the Project or may be impacted (either positive or negative) by the Project. Stakeholder groups identified for the Project are;

- National Governmental Organizations,
- Local Governmental Organizations,
- Public Economic Enterprises,
- Non-Governmental Organizations,
- Mukhtars, local communities and local residents,
- Vulnerable groups,
- Local businesses,
- Universities,
- Local media,
- Lenders of the Project, and
- Direct and indirect Project workers.

A specific SEP is currently being prepared for the Project. The overall objectives of the SEP are:

- Continuously informing the local community about the Project related development activities,

- Ensuring that the local community is informed about the hazards associated with construction, operation activities of the Project and mitigation measures implemented to reduce impacts where possible,
- Minimizing potential disputes between Contractor's and Subcontractors' and the local community,
- Incorporating local knowledge during the entire Project life cycle, by taking into account bottom-up information and feedback provided by local communities; and
- Timely and effectively responding to community concerns regarding the issues such as employment of the local workforce reserve in the construction and operation phases, disruption to daily activities, safety issues, disturbances due to noise or dust, and other environmental and social issues.

A GRM will be set up as part of the SEP for communities and individuals to formally communicate their concerns, complaints and grievances to the company and facilitate resolutions that are mutually acceptable by the parties.

#### 9.2.6.2 Stakeholder Engagement and Consultation Activities

*Stakeholder Engagement Activities for EIA Phase*

During the national EIA study for the Kınalı-Balıkesir Motorway (2016), KGM undertook initial consultations and briefings with key national governmental agencies relevant to the Project as per national requirements.

In addition, a total of five public consultation meetings were conducted in Istanbul/ Silivri, Tekirdağ/Süleymanpaşa, Çanakkale/Gelibolu, Çanakkale/Çan and Balıkesir / Balya within the scope of the EIA process. The purpose of these meetings was to introduce the Project and its aspects and collect initial opinions of the attended stakeholders in regard to Kınalı-Balıkesir Motorway and its phases.

Based on the national EIA (2016), following associations, chambers and NGOs expressed their opinion towards the Kınalı-Balıkesir Motorway:

- Çanakkale Ticaret ve Sanayi Odası (Çanakkale Chamber of Commerce and Industry);
- TÜRSAB (Association of Turkish Travel Agencies);
- Bursa Ticaret ve Sanayi Odası (Bursa Chamber of Commerce and Industry);
- Tekirdağ Ticaret ve Sanayi Odası (Tekirdağ Chamber of Commerce and Industry);
- Çanakkale Turistik Otelciler, İşletmeciler ve Yatırımcılar Dernegi (Association of Canakkale Touristic Hotel Keepers, Managers and Investors);
- Kaz Dağları Savunması (Defense of Kaz Mountains);
- İstanbul Kent Savunması (Defense of Istanbul City);
- Kuzey Ormanları Savunması (Defense of Northern Forests);
- TMMOB (Union of Chambers of Turkish Engineers and Architects);
- TMMOB Şehir Plancıları Odası (TMMOB Chamber of Urban Planners);
- TMMOB Çevre Mühendisleri Odası (TMMOB Chamber of Environmental Engineers);
- TMMOB Ziraat Mühendisleri Odası (TMMOB Chamber of Agriculture Engineers);
- Kazdağı Doğal ve Kültürel Varlıkları Koruma Derneği (Kazdağı Association for the Preservation of Natural and Cultural Resources);

- Emek ve Demokrasi Güçleri Çevre Platformu (Environmental Platform of Labor and Democracy Forces).

Overall, the stakeholders were pleased with the Kınalı-Balıkesir Motorway's positive outcomes for local economy, especially tourism. The common concerns portrayed during the meeting were related to loss of agricultural lands, waste, and potential negative impacts on environment. The questions raised were addressed respectively during the meeting.

*Stakeholder Engagement Activities for ESIA Phase*

Socioeconomic baseline field studies were first conducted between January 8th and 14th , 2023 out by a team of social experts led by a group of WSP Social Experts for the social baseline and impact assessment studies. Following this period, the Project Company made some changes to the Project Route to minimize environmental impacts, particularly on archaeological components. Details about these route changes are provided in Chapter 4: Analysis of Project Alternatives. The finalization of the Project Route occurred in April 2024, introducing new settlements in the Project Area of Influence. To identify the potential impacts on these new settlements, a second socioeconomic baseline field study was conducted from May 2nd to 4th, 2024. Within the scope of the social field studies, the neighbourhoods and villages on the Project route and around the Project facilities were visited and a community level survey and household questionnaire were applied.

The demographic information of the neighbourhoods was collected through the community level questionnaire, and through the household questionnaire, both the demographic structure of the households and the Project impacts, including expropriation, were asked to the participants. Social studies were carried out in the provinces of Tekirdağ and İstanbul which are located on the Project route and around the Project facilities, and a total of seven districts of these provinces were visited.

*Stakeholder Engagement Activities for Land Acquisition Phase*

Stakeholder engagement activities in relation to land acquisition and expropriation process will be made accordingly to national regulations and IFC PSs. It should be noted that the responsible party for the land acquisition and expropriation is KGM. However, in compliance with PS5 where land acquisition and resettlement are the responsibility of the government, the ÇOK A.Ş./EPC Contractor will collaborate with the responsible government agency, to the extent permitted by the agency, to achieve outcomes that are consistent with the PS5. In addition, where government capacity is limited, ÇOK A.Ş./EPC Contractor will play an active role during resettlement planning, implementation, and monitoring.

At this stage of the Project, no engagements have been conducted in relations to land acquisition as the Project is currently in planning phase. An official land acquisition process has not been started for the Project.

For the Project, RAP will be prepared in accordance with the IFC PSs and other applicable national regulations and international standards. Within the scope of RAP, all stakeholders affected by land acquisition and expropriation activities will be identified and engaged. The engagement results will be reflected in the RAP, and SEP will be updated as well to reflect engagements conducted. At this stage of the Project, land acquisition details are not clear. As a result, within the scope of the ESIA, a framework will be prepared and submitted to ÇOK A.Ş.

A standalone RAP will address the following topics:

- Analysis of the land requirements of the project
- Ownership and using patterns in project-affected areas
- Gaps between national legal legislation and international standards
- Socio-economic characteristics of directly-PAPs

- Analysis of affected lands, structures and sources of livelihood
- Vulnerability assessment
- Compensation strategies of physical and economic resettlement
- Livelihood restoration and mitigation measures.

### 9.2.7 External Communications and Grievance Mechanisms

The community, inquiries, concerns, and complaints regarding environmental and social impacts will be managed by the grievance mechanism established as part of the SEP.

### 9.2.8 Ongoing Reporting to Affected Communities

The system to communicate internally and externally regarding environmental and social issues are included in the stakeholder engagement activities in SEP.

## 9.3 Environmental and Social Management Plan

### 9.3.1 Construction Phase

Risks and impacts related to environmental and social issues will be identified and assessed throughout the Project's construction phase. An HSE Manager will be appointed in the beginning of the operations to supervise the implementation of overall environmental and social mitigation activities defined by the ESMS.

The identification and assessment of environmental issues and incidents will be performed within scope of the Project's area of influence (as defined by IFC PS1 and guidelines), including the area likely to be affected by:

- Project activities and facilities that are directly owned, operated or managed as a component of the Project;
- impacts from unplanned but predictable developments caused by the Project that may occur later or at a different location;
- indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.

ÇOK A.Ş. will determine and sustain management plans and procedures in order to identify the environmental and social aspects of the Project, specify the mitigation measures and perform Project construction activities with minimum impact on the environment and communities.

ÇOK A.Ş. has an ESMS for Malkara-Çanakkale Motorway which is a segment of the Kınalı-Balıkesir Motorway. The ESMS for the Malkara-Çanakkale Motorway will be adapted to the Project and developed plans and procedures will be reviewed and revised according to the Project Standards, updated and made Project specific (for details refer to Section 9.1). Environmental and Social Management Plan are already developed and implemented for Malkara-Çanakkale Motorway and will also be implemented for the Project ESMP will capture all ESIA recommendations / suggested mitigation measures.

KPIs for environmental and social objectives will be decided at "Management Review" meetings minimum annually and assessed by the Project Management. Corrective and preventive action will be taken, if necessary, in the event of failure to achieve the environmental objectives and targets.

Environmental and social plans and programs shall be monitored annually in order to achieve the environmental and social objectives. Such plans and programs shall set deadlines and identify the persons responsible for achieving the relevant objectives. If and when necessary, the environmental management programs will be amended according to regarding legislations and laws.

### 9.3.2 Operation Phase

The HSE Manager and Project owner during the operation phase will be the point of contact for Project internal and external stakeholders.

In addition to the overall management system requirements described in Section 9, the Project will develop additional operational plan and procedures as part of the environmental and social management system. All potential environmental and social impacts of the operation phase of a motorway project and mitigation measures will be considered. These will include the following, but not limited to;

- Air and noise management
- Operational motorway traffic related risks and impacts management
- Wastewater management (mainly due to maintenance activities)
- Waste management (mainly due to maintenance activities)
- Management of hazardous materials (mainly due to maintenance activities and transportation)
- Soil management (mainly due to maintenance activities)
- Biodiversity and cultural heritage management
- Stakeholder engagement
- Labour and occupational health and safety management
- Emergency response management

## 9.4 Labour Issues and Health & Safety Management Plan

### 9.4.1 Employee Rights

The Project can increase the development benefits of the Project by treating its workers fairly and by providing safe and healthy working conditions, promoting sound worker-management relations.

ÇOK A.Ş. has Employment Policy and this policy will be implemented during the lifespan of the Project. In addition to this policy, the Human Rights Policy will be prepared and implemented for the Project. This policy aims to reduce poverty provide jobs and income that will create inclusive economic growth, reduce poverty and create working conditions that are equal, non-discriminatory and respectful of human rights.

In the Project, principles regarding fundamental rights will be strictly followed (based on ILO Conventions). These principles are:

(a) The effective recognition of the right to freedom of association and collective bargaining

(b) The elimination of all forms of forced or compulsory labour

(c) The elimination of child labour

(d) The elimination of employment and occupational discrimination; and

(e) A safe and healthy working environment

Within these topics, the Project will develop employee rights and workforce management policies and plans.

A Project specific Human Resources management system will be established to manage labour rights, working conditions, worker's organisations, child/forced labour, non-discrimination and equal treatment, retrenchment, grievance mechanism, worker's engaged by third parties, security and health issues for all workers.

An employee grievance mechanism will be established and implemented during construction and operation phases. There will not be collective dismissal due to definite term of the construction works. However, in case of dismissal of workers (if the dismissal occurs before the ending period of the definite term of the contract), Turkish Labour law will be applied. According to the law; when the employer contemplates collective terminations for reasons of an economic, technological, structural or similar nature necessitated by the requirements of the enterprise, the establishment or activity, he shall provide the union shop-stewards, the relevant regional directorate of Labour and Social Security and the Public Employment Office with written information at least 30 days prior to the intended lay-off. If there is a union representing the workforce, they have to notify the union as well as the Ministry of Labour and Social Security.

Prior to implementing any collective dismissals, ÇOK A.Ş. will carry out an analysis of alternatives to retrenchment. If the analysis does not identify viable alternatives to retrenchment, a retrenchment plan will be developed and implemented.

### *Freedom of Association and Collective Bargaining*

Freedom of association refers to the right of all employers and all workers to freely and voluntarily form and join associations /organizations for the promotion and defence of their professional interests. All Project employees have the right to establish, join and manage their own organizations without any interference, coercion or restriction.

Unions/associations/organizations define legal formations that include rulemaking, management and representative election activities within the boundaries of laws.

In this scope, freedom of association includes freely discussing issues related to workers' rights in the workplace, in the working environment, with employers, unions and other worker representatives.

In accordance with ILO and IFC requirements, everyone, including employers, has the right to freedom of expression and thought in the Project.

This freedom includes the right to collective bargaining. Collective bargaining is a voluntary process or activity in which issues such as the regulation of the working conditions of employers and workers and the relations between employers and workers and their organizations are negotiated. In the collective bargaining process, workers' representatives freely appointed by the employer, employers' organizations, trade unions or workers take part.

The Forced Labour Convention and the Convention on the Abolition of Forced Labour, included in the ILO Conventions, define the regulations and rules for the elimination of all forms of forced or compulsory labour.

### *Elimination of All Forms of Forced or Compulsory Labour*

Forced labour can take many different forms. Forms of forced labour may arise as follow[236]:

- A domestic worker may face forms of forced labour, such as confiscation of identity by the head of the household or another member of the household, deprivation of liberty through coercion or violence, restriction of economic freedom or unpaid employment.

[236] https://www.ilo.org/declaration/principles/eliminationofchildlabour/lang--en/index.htm#:~:text=Economic%20circumstances%20can%20compel%20people,term)%20is%20something%20quite%20distinct.

- Even if the villagers or the local population are reluctant; by force of government administrators, police officers, or local administrators, they may be compelled to work near their settlements, such as building roads, digging irrigation canals.
- Another form of forced labour can be defined as tying employees through debts. When disadvantaged groups, such as a poor and illiterate peasant, are compelled to work for a specified period of time to pay off a debt, or to assume a debt and repay it through work, this creates a process of unpaid, precarious and violent forced labour.
- Labour/human trafficking is a form of forced labour. People who are trapped by confiscating identity documents of an intermediary for employment purposes, making them economically dependent may be subject to forced labour.

In the face of all these risks, the Project will develop measures and plans that prevent forced labour and eliminate risks, in line with the ILO Declaration of Fundamental Principles at Work and Rights.

### *Elimination of Child Labour*

According to the ILO Convention on Worst Forms of Child Labor[237] and in accordance with the commitments set forth in IFC PS 2, the Project will not permit any form of work that may be economically exploitative or dangerous or interfere with a child's education or be harmful to a child's health, physical, mental, spiritual, moral, or social development.

Young people under the age of 18 will not be employed under the Project.

Risk factors related to child labour will be subject to risk assessment that will be monitored throughout the Project period.

Considering the importance of eliminating the worst forms of child labour, collaboration with families will be made and awareness training will be given in schools and/or local settlements.

### *Elimination of Employment and Occupational Discrimination*

Elimination of employment and occupational discrimination[238] can affect men or women direct or indirect on the basis of their sex, race or skin colour, national extraction or social origin, religion, or political opinions differ from those of others.

According to IFC PS2 and the ILO, the Project will not make employment decisions based on personal characteristics unrelated to the needs of the job. The recruitment process will be based on the criteria, equal opportunity and fair treatment. At any stage of the Project, there will be no discrimination with respect to various aspects of the employment relationship, including hiring, compensation (including wages and benefits), working conditions and conditions of employment. All employees will be equal in terms of education, promotion, dismissal, access to retirement, discipline rules.

### *Safe and Healthy Working Environment*

ILO defines the safe and healthy working environment a fundamental principle and right at work.

According to the Occupational Safety and Health Convention and the Promotional Framework for Occupational Safety and Health Convention, Project will develop working conditions and accommodation environment.

[237] https://www.oas.org/dil/C182_Worst_Forms_of_Child_Labour_Convention_1999.pdf

[238] https://www.ilo.org/declaration/principles/eliminationofdiscrimination/lang--en/index.htm#:~:text=Discrimination%20at%20work%20denies%20opportunities,such%20as%20land%20and%20credit.

According to IFC PS4, the Project will anticipate and prevent adverse impacts on the health and safety of Affected Communities throughout the duration of the Project.

It will ensure that it is done in a way that avoids or minimizes risks to Affected Communities in accordance with IFC PS4.

The Project will establish policies and rules in line with the relevant human rights principles of the protection of personnel and property.

Working conditions will provide an anti-discrimination, transparent communication, and a healthy working environment to implement the principle of equality.

A suitable social and physical working environment will be designed for disadvantaged groups, women and the disabled.

The working environment will provide an equal social, cultural, and hygienic environment for every employee.

All kinds of measures, policies and rules that will provide safe and healthy working environments free from violence and harassment will be developed and implemented.

### 9.4.2 Project Policy on Employee Rights

The Project will develop tools and plans that guarantee employee rights, comply with IFC PSs and ILO conventions, and provide a human rights-respectful work environment.

These tools and plans will cover all employee types below:

- Direct Workers
- Contracted Workers
- Community Workers
- Primary Suppliers
- Migrant Workers

The Employment Policy of the ÇOK A.Ş. will be adapted to the Project. An Employment Policy will have clear commitment of the top management related to, but not limited to, below listed subjects:

- Gender equality
- Gender based violence and harassment.

Code of Conduct and Gender-based Violence and Harassment Management Plan will be complied with ESMP and the other management plans. The Project will ensure that all Project workers are contracted, and employee contracts at least include role and responsibility of the worker, labour rights and working conditions, wages-benefits and annual leave conditions.

In addition, the following content that defines the rights and freedoms of workers will be planned and implemented in accordance with IFC and ILO conventions:

- Wages and Deductions
- Working Hours
- Rest Breaks

- Leave
- Overtime Work
- Labour Disputes
- Accommodation
- Transportation
- Policies and Procedures
- Labour Influx and Gender-Based Violence
- Labour and Working Conditions, Grievance mechanism
- Contractor Management
- Primary Suppliers

The Project will implement the retrenchment requirements in the Local Content Procedure of the ÇOK A.Ş. in line with IFC PS2.

### 9.4.3 Project Policy on Supply Chain

In line with IFC PS2, the negative impacts connected with supply chain will be taken into consideration where low labour cost is a role in the competitiveness of the goods supplied. ÇOK A.Ş. will look into and address any issues related to forced labour and child labour in its supply chain.

The Supply Chain Management Plan of ÇOK A.Ş. will be adapted to the Project considering the Project activities and associated facilities and main contractor activities.

It will be revised according to the Project Standards, updated and made Project specific.

Supply Chain Management Plan will include at least the following topics:

- Establishing a management system that will ensure that the suppliers within the scope of the Project are evaluated in accordance with the IFC PSs in the selection and that will standardize them,
- To set, implement and monitor local targets in line with IFC standards,
- Developing and implementing measures to ensure equal participation of vulnerable groups and women in procurement processes,
- To define policies and practices that will prevent discrimination, inequality, child labour and forced labour.

The Project will develop tools that guarantee employee rights, comply with IFC PSs and ILO conventions, and provide a human rights-respectful work environment. The Project will adopt strategies that protect employee rights, adhere to IFC PSs and ILO standards, and ensure a workplace that respectful to human rights as stated above.

Equal procurement opportunities will be provided to local small businesses in line with the Local Content Procedure. KPIs listed in the Local Content Procedure, Supply Chain Management Plan and Subcontractor Management Plan will be tracked. In line with the Local Content Procedure, EPC Contractor will periodically report to ÇOK A.Ş. by quarterly reports which will summarize all issues about construction's environmental, health and safety and social performance. These reports will also contain issues related to local procurement performance.

### 9.4.4 Worker's Accommodation

In total one main camp sites will be established within the scope of the Project and the information regarding to proposed camp sites are provided in Chapter 3.

Project Specific Camp Site Management Plan (including Workers' Accommodation) will be prepared within the scope of the Project in line with the IFC/EBRD's Guidance Note on Worker's Accommodation, 2009. Following points will be considered and included as a minimum into the Camp Site Management Plan to be developed:

- The minimum room space will be 4 square meters per person (assuming a height of 2.4 m).
- The rooms will be adequately ventilated and lit.
- Adequate number of toilets and sanitary fittings will be provided (1 toilet, 1 hand wash basin, 1 urinal and 1 bathroom with bench per 15 person).
- The camp site will be built with adequate materials, kept in good repair, and kept clean and free from rubbish and other refuse.
- Both natural and artificial lighting will be provided and maintained at the camp sites, e.g., window area represents not less than 5% to 10% of the floor area. Emergency lighting will be provided.
- Drinking water quality will be regularly monitored.
- Wastewater, sewage, food and any other waste materials will be adequately discharged, in compliance with local or World Bank standards. Specific containers for rubbish collection will be provided and emptied on a regular basis.
- Pest extermination, vector control and disinfection will be carried out throughout the living facilities in compliance with local requirements.
- Rooms/dormitories will be kept in good condition, aired, and cleaned at regular intervals, built with easily cleanable flooring material.
- Sanitary facilities will be located within the same buildings and provided separately for men and women.
- Density standards are expressed either in terms of minimal volume per resident or of minimal floor space. Usual standards range from 10 to 12.5 cubic meters (volume) or 4 to 5.5 square meters (surface).
- A minimum ceiling height of 2.10 meters will be provided.
- In collective rooms, standards range from 2 to 8 workers to share the same room. All doors and windows will be lockable with mobile partitions or curtains to ensure privacy.
- Every resident will be provided with adequate furniture such as a table, a chair, a mirror, and a bedside light.
- The minimum space between beds of 1 meter will be ensured. Triple deck bunks are prohibited.
- Sanitary and toilet facilities will be constructed of materials that are easily cleanable and will be cleaned frequently and kept in working condition.
- Shower/bathroom facilities will be provided with an adequate supply of cold and hot running water.
- Canteen, cooking, and laundry facilities will be built in adequate and easy to clean materials and will be cleaned frequently and kept in working condition. Canteens have a reasonable amount of space per worker. Standards range from 1 square meter to 1.5 square meters.

- Adequate facilities for washing and drying clothes will be provided. Standards range from providing sinks or tubs with hot and cold water, cleaning soap and drying lines to providing washing machines and dryers.
- Food provided to workers to contain an appropriate level of nutritional value.
- Sufficient number of first aiders with adequate first aid training will be available at each camp site. Adequate number of first aid kits will be stoked at the camp sites. Infirmaries will be established at the camp sites. The distance and the transportation arrangements to the nearest hospitals will be arranged in advance via the Emergency Response Plans to be prepared.
- Suitable and sufficient number of emergency response equipment including fire response and fire detection systems will be provided at the camp sites. Emergency muster points will be designated, and periodic maintenance of all equipment will be ensured.
- Community Health, Safety and Security Procedure Plan including clear measures to protect workers against theft and attack will be implemented.
- A Camp Manager will be appointed for each camp site to monitor the compliance with the standards and engage with the workers.

An accommodation camps audit programme will be applied to understand the following topics and in case of noncompliance corrective actions will be applied.

- Availability of workers accommodation plan/camp management plan,
- Distribution of Local-nonlocal workers distribution,
- Women-men distribution,
- Skilled-semiskilled-unskilled distribution,
- Previous grievances related with accommodation site and actions taken should be provided,
- Availability of management plan,
- Previous grievances related with the traffic issues and actions,
- Justification of selection of the accommodation area,
- Availability of sewage system within the site,
- Availability of ventilation/heating/air conditioning system and windows in the rooms,
- Availability of emergency lightings,
- Availability of potable water,
- Drinking water source,
- Monitoring of potable and drinking water,
- Management of waste in the accommodation areas,
- Material of flooring,
- Minimum floor space for each worker,
- Height of the ceiling,

- Provision of curtains,
- Furniture provided,
- Provision of separate sleeping areas for women and family accommodations,
- The space for each bed,
- Usage of Double deck bunks what is the space between them,
- Provision of new mattress, pillow, cover, and clean bedding for each employee,
- Frequency to wash bed linen,
- Provision pf cupboard (475-litre big lockers and 1 meter of shelf unit recommended),
- Provision of separate storage for work boots and other personal protection equipment,
- Provision of separate sanitary and toiled facility for women and men (1 unit per 6 persons. For urinals, usual standards are 1 unit to 15 persons),
- Details of canteen (fire protection, hygiene control, handling food waste,
- Details of Laundry facilities,
- The number of first aid kits adequate to the number of residents are available,
- Availability of First aid kits are adequately,
- First aid training to workers,
- Standards for recreation areas that will be provided to workers (TV, internet, exercise equipment etc.),
- Guidance on the detrimental effects of the abuse of alcohol and drugs and other potentially harmful substances and the risk and concerns relating to HIV/AIDS,
- Code of conduct and Security Plan if available,
- Emergency plan,
- Cultural awareness training if available,
- Transportation, food and health services that will be provided to workers.

### 9.4.5 Occupational Health and Safety

Labour Law No.4857 and Occupational Health and Safety Law No.6331 and relevant regulations and international standards will be applied throughout the Project. The following main principles shall apply at all phases of the Project:

- Risk Assessments will be prepared for all Project tasks and locations according to Regulation on Health and Safety Risk Assessment.
- Occupational safety specialist, occupational physician and other health staff will be appointed in the Project both for the Contractor and the subcontractors as per OHS Law No. 6331. In case there is lack of personnel in the undertaking competent enough to be designated, a joint health and safety unit will partially or fully provide these services.

- ERP will be implemented for the Project and drills will be conducted at least on an annual basis. Emergency Response Teams will be established, and appointed personnel will have appropriate training as per Regulation on Emergency Cases in Workplaces and First Aid Regulation.
- In the event of serious, imminent, and unavoidable danger; workers shall leave their workstation dangerous area and proceed to a place safety without any necessity to comply with the requirement. Workers will not be placed at any disadvantage because of their action.
- Workers (including subcontractors) and the workers' representatives will be informed about the safety and health risks and protective and preventive measures, their legal rights and responsibilities, workers designated to handle first aid, extra ordinary situations, disasters, firefighting, and the evacuation.
- Workers (and/or workers' representatives) will be consulted regarding occupational health and safety aspects to make their proposal. Occupational health and safety committees will be established in line with the legal requirements.
- Employees will be provided with appropriate personal protective equipment and will be monitored regularly about their usage.
- Employees will be subject to medical controls before the employment, periodically as within legally required intervals and as occupational physician deems necessary.
- All accidents, incidents and near misses will be reported, and workers will be encouraged to share their observations. All accidents will be investigated to prevent further reoccurrences. Accident/Incident Reporting and Investigation Procedure will be established.
- All hazardous materials will have Safety Data Sheets and will only be used by authorized personnel. Regulation on Health and Safety Precautions Regarding Working with Chemicals requirements will be followed.
- A subcontractor management system will be established which will include the procedures to be implemented for the selection, evaluation and management of the subcontractors including auditing and training needs for the proper implementation of the environmental and social management programs.
- A monitoring system will be implemented to ensure that all control measures are being carried out in practice and all duties are fulfilled. All non-compliances, control measures, timescales and responsible personnel will be recorded in a system to be established. Appropriate communication system will be established between the Contractor and the subcontractors to monitor and track the completion of the corrective actions.
- The main occupational health and safety issues that have the highest hazard and therefore accident potential in the construction and operation phase of a motorway project are summarized in table below.

**Table 307: Main construction and operation phase OHS issues**

| Construction Phase OHS issues | Operation Phase OHS issues |
|---|---|
| ■ Working at height<br>■ Hot works<br>■ Lifting operations<br>■ Suspended loads<br>■ Working in confined spaces<br>■ Working in remote locations<br>■ Excavation and ground works | ■ Driving<br>■ Road transport<br>■ Vehicle traffic accidents<br>■ Fatigue<br>■ Electrical hazards and magnetic fields |

| Construction Phase OHS issues | Operation Phase OHS issues |
|---|---|
| ■ Working with hazardous materials<br>■ Hazardous Atmosphere<br>■ Manual handling<br>■ Working with hand tools<br>■ Working around heavy vehicles<br>■ Site traffic and mobile plant<br>■ Occupational illnesses<br>■ Electrical hazards<br>■ Heat stress<br>■ Slip, trips<br>■ Noise and vibration exposure<br>■ Lone or remote work<br>■ Road transport<br>■ Emergency response<br>■ Weather<br>■ Security<br>■ Infectious diseases<br>■ Storage of hazardous materials such as fuels and chemicals | ■ Maintenance works (which may include physical, chemical, biological hazards, also confined space entry)<br>■ Occupational illnesses<br>■ Malfunction/collapse of structural elements impacting workers/public<br>■ Emergency response<br>■ Weather<br>■ Security |

The following procedures will be established at a minimum which will detail the safe work principles for each task:

- Hazard and Risk Assessment and Management Procedure
- Accident/Incident Reporting and Investigation Procedure
- Health and Safety Rewarding and Discipline Procedure
- Permit to Work Procedure
- General Site Rules Procedure
- Working at Height Procedure
- Safe Use of Working Platforms, Scaffolds and Ladders Procedure
- Lifting Operations Procedure (covering cranes)
- Excavation Procedure
- Working in Confined Spaces Procedure
- Training Procedure
- Manual Handling Procedure
- Electrical Works Procedure
- Lifting Works Procedure
- Personal Protective Equipment Usage Procedure

- Fitness for Duty and Fatigue Management Procedure
- Maintenance and Calibration Procedure
- Housekeeping Procedure

Operational Technical Procedures to be developed covering all processes including the design of the Motorway infrastructure, signal system and traffic, including maintenance and operation.

#### *9.4.5.1 Construction Phase OHS Management*

The construction phase activities shall comply with the requirements given in the Regulation on Health and Safety at Construction Sites. The minimum workplace control measures to be implemented during the construction phase will be as following:[239]

- A work permit system will be implemented for high-risk tasks including hot works, working at height, lockout/tag out, excavation, confined space entries, etc.
- If working at height cannot be eliminated, work equipment or other methods will be searched and used to prevent a fall from occurring. Collective protection systems, such as edge protection or guardrails, should be implemented before resorting to individual fall arrest equipment. All working at height works will consider the workers' fitness for duty and training, working platforms, safe access/egress, periodic controls, weather conditions, emergency rescue plan detailing the methods to be used to rescue workers if they become stranded or incapacitated while at height, etc.
- Appropriate hazardous materials storage areas will be established with suitable materials segregation, adequate ventilation, spill control and emergency response measures.
- All lifting operations will consider the appropriate type of lifting equipment, method of slinging, attachment points, size, weight of the load, safe lifting limits, periodic maintenance of all equipment, operator training requirements, exclusion zones, etc.
- For remote works, there will be suitably qualified first aider personnel in the work crew and suitable communication equipment will be always available for the work team.
- All manual handling activities will consider the task, individual, load and the environmental conditions.
- Work areas will be clearly signed, segregated and adequate lighting provisions will be ensured.
- All electrical systems and equipment will be properly selected, installed, used, and maintained. Only authorized personnel will be allowed to use/maintain electrical systems.
- Proper housekeeping will be ensured at the construction areas including adequate cable management, appropriate storage, cleaning of wet surfaces.
- All excavation works will consider detection of underground and overhead services, the appropriate side supports, safe materials storage preventing side collapses safe access/egress, edge protections, ground and surface water inflow, accumulation of hazardous atmospheres, etc.
- Occupational health risks will be assessed for all work tasks including noise, dust, vibration, chemical exposure, etc. and appropriate organizational and engineering control measures will be ensured.

[239] Health and safety in construction HSG150, Health and Safety Executive

- No one will be allowed to enter confined spaces before ensuring the appropriate control measures including detection and monitoring the hazardous atmospheres, appropriate lighting and communication systems, emergency rescue equipment and procedures, etc.
- All workers including subcontractors will be equipped with suitable personal protective equipment (PPE) considering the type of task they are involved.
- All equipment used at site will be periodically maintained and controlled as per Regulation on Health and Safety Conditions Regarding Use of Work Equipment.
- On site traffic management controls will be ensured.

#### *9.4.5.2 Operation Phase OHS Management*

All necessary control measures and management systems will be established to ensure that the Project operates in line with the national and international OHS requirement (e.g., 2019/796/EC Road Infrastructure Safety Management, IFC Environmental, Health, and Safety Guidelines for Toll Roads). Occupational Health and Safety Plan will be prepared in line with the national and international requirements and implemented during the Project lifespan.

According to IFC Environmental, Health, and Safety Guidelines for Toll, the minimum control measures to be implemented during the operation phase will be as following:

- Development of a transportation management plan for road repairs that includes measures to ensure work zone safety for construction workers and the traveling public;
- Establishment of work zones to separate workers on foot from traffic and equipment by:
  - Routing of traffic to alternative roads when possible
  - Closure of lanes and diversion of traffic to the remaining lanes if the road is wide enough (e.g. rerouting of all traffic to one side of a multi-lane highway)
  - Where worker exposure to traffic cannot be completely eliminated, use of protective barriers to shield workers from traffic vehicles, or installation of channelling devices(e.g., traffic cones and barrels) to delineate the work zone
  - Regulation of traffic flow by warning lights, avoiding the use of flaggers if possible
  - Design of the workspace to eliminate or decrease blind spots
  - Reduction of maximum vehicle speeds in work zones;
  - Training of workers in safety issues related to their activities, such as the hazards of working on foot around equipment and vehicles; and safe practices for work at night and in other low-visibility conditions, including use of high-visibility safety apparel and proper illumination for the workspace (while controlling glare so as not to blind workers and passing motorists).
- Use of millers and pavers with exhaust ventilation systems and proper maintenance of such systems to maintain worker exposure to crystalline silica (millers and grinders) and asphalt fumes (pavers) below applicable occupational exposure levels;
- Maintenance of work vehicles and machinery to minimize air emissions;
- Installation of tollbooth ventilation and air filtration systems;

- Use of protective clothing when working with cutbacks (a mixture of asphalt and solvents for the repair of pavement), diesel fuel, or other solvents;
- Maintenance of the road to prevent mechanical failure of vehicles due to road conditions;

# 10.0 CHALLENGES AND UNCERTAINTIES

This section provides an overview of the challenges faced during the development of this ESIA and the uncertainties related to potential future changes in the reliability of impact predictions. As will be illustrated, EPC Contractor, ÇOK A.Ş. and KGM will establish procedures (especially Management of Change (MoC) procedure) to:

- manage data gaps,
- ensure that environmental and socio-economic aspects are considered in the further Project development phases,
- develop appropriate and effective measures for the potential impacts and risks identified, and
- monitor the effectiveness of measures put in place for protection of the environmental and social environment and impact mitigation.

## 10.1 Challenges

Numerous challenges were encountered and addressed during the preparation of this ESIA. Primarily, among these challenges are the following:

- *Data Requirements and Complexity:* A major challenge during the ESIA process was collecting, verifying, and analysing existing and field data using consistent and internationally recognized methods. As is evident in this ESIA, the extent and depth of available and collected data presented a challenge in terms of coherently and effectively presenting it within the limited time available for review by the client, lenders, and other relevant stakeholders.
- *Design Challenges:* The lack of detailed design studies especially for associated facilities and missing approval by the authorities due to the ongoing planning stage caused difficulties in terms of assessments.
- *Data concerning Social Conditions:* WSP Türkiye collected primary data using household and community surveys as part of and socioeconomic field survey and targeting all villages/neighbourhoods in the AoI. In most cases, mukhtars did not have enough and precise information on population such as age distribution or education levels of the residents of villages/neighbourhoods. As a result, certain data in this report is based on secondary sources. Due to the dominance of the patriarchal structure in Türkiye, men are typically regarded as the heads of households, leading to almost all household surveys being conducted with men, despite efforts to offer alternatives for women's participation. The first round of household surveys for the SIA was planned to include 201 participants, but a total of 186 people responded to the SIA field survey. Some participants declined to answer questions about the Project due to concerns, and some individuals could not be found at certain households. The second round of the socioeconomic site study consisted of 63 household surveys.
- *Environmental and Social Baseline:* Some detailed design parameters, such as vertical alignment, exact vehicle types, and the final location/layout and number of associated facilities and Project components (e.g., culverts, overpasses, underpasses), are not yet finalized. The Project layout, including associated facilities provided on March 2024, was accepted as the final version and was considered when determining the environmental and social baseline conditions. Any changes to the layout after March 2024 are not reflected in this report and will be subject to the MoC. The ESIA report considers traffic volumes based on the General Directorate of Highways State Road Traffic Volume Map. If a more accurate traffic assessment study becomes available in the next stages of the Project, the MoC procedure will be implemented, and the impact on the traffic component will be re-assessed.

- *Environmental and Social Impact Assessment*: The impact assessment is primarily based on the Project Description in Chapter 3 of this report. In this context, some detailed design parameters, vertical alignment, and exact vehicle types are not yet finalized. Once the detailed design is finalized, any changes that could lead to significant impacts should be re-assessed considering the final design parameters using the MoC procedure.
- *Social Conditions- Land Acquisition:* The land acquisition process is under the control of KGM, not EPC Contractor or ÇOK A.Ş. EPC Contractor and ÇOK A.Ş. are legally not parties that can perform land acquisition; they must establish close relations with KGM and guide them to conduct the process in accordance with international standards.
- *Identification of Cumulative Impacts*: In Türkiye, the only open-source information on other investments in the vicinity of the Project is the eÇED database (the official electronic database including national EIA reports and Project Introduction Files). Beyond this, there is no open-source information on environmental components (such as contaminated land databases). For investments located near the Project that followed the EIA process, environmental and social information is limited to what is presented in the EIA reports or Project Introduction Files, which may not contain very detailed information. Additionally, it is not possible to access any environmental and social data on investments realized with special permits without undergoing the EIA process. Once the EIA report is approved, investors have 5 years to start their activities, making it difficult to obtain information on whether investments that have not yet commenced but are within the 5-year period will actually be made.

## 10.2 Uncertainties

This ESIA has identified potential Project impacts and mitigation measures based on a variety of data sources, including published and unpublished data, local expert opinions and extensive field surveys by recognized national experts and organisations. In spite of this effort, and as is common for all linear projects of this scale and complexity, some uncertainties remain regarding the level of potential impacts, and the effectiveness of the prescribed mitigation measures as the Project is constructed and placed into operation.

Where the magnitude and/or significance of a potential impact could not be fully predicted and quantified, the ESIA has adopted a precautionary approach in the development of mitigation measures to ensure that the mitigation is sufficient to cover the potential uncertainty. The precautionary approach defines that when the consequences of an action are not fully predictable, plans to cope with them are tailored to meet a worst-case situation.

Still, there remain certain known uncertainties that EPC Contractor and ÇOK A.Ş. intend to tackle as follows:

- *Project Design Information:* At the time this ESIA report is issued, there is no detailed Project design available for some of the Project components and legal approvals are not available yet (quarries, storage areas, etc.). In spite of this, the ESIA has presented a robust Project Description Section (Section 3) that includes elements of relevance for the identification of Project impacts and risks that allowed the preparation of the articulated ESIA report at hand. Any change or new Project detail that will be introduced will be considered and managed through a MoC procedure.
- *Construction Methods:* The uncertainties identified in this ESIA are predominantly associated with the Project construction phase, and as such, are short-term by nature. EPC Contractor will implement international best practice methods including the conducting of pre-construction surveys and development of site-specific method statements during the further Project phases.
- *Decommissioning/Closure Phase:* Since exact Project life span is not determined for the Project it is not possible to anticipate the actions for the decommissioning/closure phase in detail. The Project will be

realized with BOT model. The total lifetime of the Project has been planned as 100 years. The concession period of the Project has not yet been determined. At this stage of the Project, for operations and maintenance of the Motorway, there are two options; ÇOK A.Ş. will appoint a contractor in due course (referred to herein as the "Operation and Maintenance ("O&M") Contractor") or ÇOK A.Ş. will operate the Project by itself. The operation period will be clarified later in consultation with the MoTI and Undersecretariat of Treasury.

- *Land acquisition:* The Project execution will require permanent acquisition of land by using expropriation. The Project is expected to cause economic displacement and physical resettlement, however, at this stage, the magnitude of displacement is not completely known since the land acquisition files have not been prepared for the Project and land acquisition process in under the control of KGM not EPC Contractor/ÇOK A.Ş. Since final expropriation corridor is not certain yet, the Project social study area is defined according to the Project Route. For the Project, Resettlement Action Plan (RAP) will be prepared in accordance with the IFC PS 5 and other applicable national regulations. Within the scope of RAP, representative number of stakeholders affected by land acquisition and expropriation activities will be identified through information provided by ÇOK A.Ş. and engaged during social field study. The outputs of the engagement will be reflected in the RAP and SEP.
- *Effectiveness of mitigation measures*: A degree of uncertainty is also attributable to the effectiveness of the prescribed mitigation measures identified in the assessment process. These uncertainties are addressed and minimized through the implementation of effective management and monitoring plans and audits. ESMS will be developed to implement the mitigation measures and monitoring activities, and a Project MoC will be designed to ensure that all changes to a Project component assessed.

It should be noted that any changes/amendments to Project Standards (Turkish legal framework or international standards) after June 2024 is not reflected in this report. Any significant change in the Project Standards will be subjected to MoC.

## 10.3 Managing Change and Uncertainty

EPC Contractor and ÇOK A.Ş. will develop tools and methodologies to manage change and the risks associated with uncertainty, including:

- Change Management Procedure*:* A Change Management Procedure will be developed for both the construction and operational phases of the Project. This procedure is designed to help the Project assess changes in various contexts, such as political, legal, or regulatory shifts, modifications to engineering designs or the overall project scope, changes within the EPC contractor or major suppliers and subcontractors, and alterations in the senior management or operational procedures of ÇOK A.Ş., among other factors. By implementing a Change Management Procedure, the Project will be able to evaluate the impact of any identified changes and update management plans, mitigation measures, personnel, and other elements as necessary, ensuring that any negative effects of the changes are minimized and that the Project remains compliant with the Applicable Standards.
- *A Project Environmental and Social Management System:* designed to provide the structure and procedures for ensuring the implementation and effectiveness of mitigation and other measures as defined in this ESIA and meeting requirements.

### 10.3.1 Management of Change Procedure

A Project MoC will be designed to ensure that all changes in Project technical aspects and design, in Project component, activity or procedure as well as regulatory changes that might occur during the Project development are duly analysed in terms of potential impacts to other Project components or to environmental and social

components within the Project AoI. The purpose of the MoC is to provide guidance and tools to implement, manage and control changes with respect to project requirements as well as to ensure that changes deliver the intended benefits without adverse side effects.

A design change having an undefined impact on the environment, which subsequently requires additional site data necessary for the assessment of potential environmental and social impacts, is a case in point.

As a basis, the MoC Procedure will define a technical change as "*an activity that results in temporary or permanent modifications that differ from the current design basis [and] applies to facilities in operation and in the development phase*". For example, changes may include, but are not limited to, the following:

- Any alteration to the original or subsequent design basis of any aspect of the Project;
- Alterations to the physical configuration and operating conditions of the structure, systems or equipment;
- The physical substitution of any item of equipment with an alternative that is not identical to the original—e.g., a non-like-for-like replacement—even if the specification remains the same;
- The permanent removal from service of any safety system or item of equipment;
- The temporary or permanent addition of any item of structure or equipment;
- Any alteration or addition to the use of structure, facility or equipment, other than that permitted by design;
- Any alteration of material specification;
- Alteration from an approved method of statement;
- The rectification, repair, or correction of any design defect that did, or potentially could, affect the integrity of the project components, facilities, services;
- A change in the setting or arrangement of protective devices installed for safety or environmental reasons;
- A change in regulatory requirements that affects the design, processes, operations, or the extent of mitigation measures applied for safety, environmental, and/or social reasons;
- A change in the procedures that affects one or more processes;
- A change in the organizational structure;
- A change that is applied for a defined, specified, and/or limited time period.

MoC Procedure will define a review process where description of change, type of change (technical, organizational, operational/regulatory, etc.), need for the change, classification of the change (minor, significant, major) will be explained and documented. The procedure will define a risk assessment methodology in order to ensure that potential risks as a result of change and during the implementation of the change will be assessed and relevant measures will be planned and implemented.

MoC Procedure will at least include the information/definition/requirement related to below subjects:

- Roles and Responsibilities
- Approving Authority
- Definition of the changes subjected to MoC (permanent, temporary, organizational, facilities, equipment etc.)

- Definition of the changes not subjected to MoC (permanent, temporary, organizational, facilities, equipment etc.)
- Classification of the change (insignificant, minor, significant, major etc.)
- Risk assessment methodology (environmental and/or social consequence, period etc.)
- Risk level of the change (very low risk, low risk, moderate risk, high risk, very high risk etc.)
- Definition of the actions to be taken to minimise the risk (ESMS, training, additional surveys etc.)
- Approval process
- Planning and implementation process of change
- Reporting (MoC forms, risk assessment reports, approval forms, related ESMS item developed/present, implementation plans, actions plan etc.)
- Monitoring

The review process will include initiation, appraisal, approval, implementation, verification, close out and final documentation. Only after identification of technical, health, safety, environmental and social impacts, and an analysis of their significance, approval of the change will be considered.

### 10.3.2 Environmental and Social Management System

The MoC Procedure will be part of a Project ESMS designed to provide the structure and procedures for ensuring the implementation and effectiveness of mitigation and other measures as defined in this ESIA and meeting requirements will be established by EPC Contractor and ÇOK A.Ş. for construction and operation.

The ESMS will provide the tools, organization and documentation requirements to effectively manage ES impacts and risks of the Project. Importantly, it ensures that environmental and social issues will be incorporated into the Project scheduling and work activities.

The ESMS needed for the Project are outlined in Section 9 of this ESIA report. The ESMS will include plans and procedures for managing challenges and uncertaintes of the Project and ensure performance is in line with the applicable requirements.

# 11.0 CONCLUSION

## 11.1 Overview

The ESIA for the Project has been conducted following a series of phases including:

- Scoping
- Baseline
- Impact assessment
- Stakeholder engagement
- Environmental and Social Management System Structure

The ESIA adheres to the relevant Turkish regulations and aligns with the 2012 IFC Performance Standards and EHS Guidelines. The activities were conducted by a multidisciplinary team of Turkish and international experts in environmental and social fields.

As part of the ESIA, several environmental and social surveys, modeling efforts, and assessments have been carried out, including but not limited to:

- Baseline surveys of environmental, biological, and social components
- Baseline measurements for physical components (soil, surface water, groundwater, air, noise, and vibration)
- Air emissions modeling
- Noise modeling
- Impact assessments of the physical, biological, and social components
- Climate change impact assessment
- Human rights impact assessment

The impact assessment methodology is centered around defining Valued Environmental and Social Components (VECs), which are elements of the physical, biological, and social environment deemed worthy of protection by relevant legislation or international standards. Assessment Endpoints are then identified as specific, measurable aspects of the VECs that allow for the evaluation of impacts, whether positive or negative.

The impact assessment process follows these steps:

- **Identification of Project Components:** These are individual elements of the project, categorized by similar characteristics and procedures during construction, operation, and decommissioning.
- **Identification of Impact Factors:** These are factors that can alter the environmental and social quality of the VECs, such as air emissions, water discharge, etc.
- **Determination of VEC Sensitivity:** This involves assessing how sensitive the VECs are to the identified Impact Factors, based on the environmental and social data collected during the baseline studies.
- **Definition of Impacts:** This step involves evaluating the impacts as a result of the interaction between Impact Factors and the sensitivity of the VECs for each identified Assessment Endpoint.

Each project component has been linked to one or more impact factors for each phase of construction, operation, and decommissioning.

Impacts have been evaluated with the assumption that standard mitigation measures, based on good industry practices, are correctly applied. Additionally, site-specific or issue-specific mitigation measures have been identified to address areas with significant residual impacts, ensuring that these impacts remain within acceptable levels after further mitigation.

The assessment of impacts was conducted separately for the three project phases—construction, operation, and decommissioning—due to the distinct nature and extent of impacts associated with each phase.

The Environmental and Social Assessment Study has led to the following conclusions:

6) **Continuous Stakeholder Engagement:** Ongoing stakeholder engagement is essential for managing the social risks associated with the Project. A Stakeholder Engagement Plan, which will include internal and external grievance mechanisms, will be developed and implemented.

7) **Air and Noise Monitoring:** The Project will establish air and noise monitoring programs to ensure compliance with regulatory requirements and relevant Environmental and Social Management System (ESMS) provisions.

8) **Biodiversity Mitigation Measures:** A comprehensive list of mitigation measures for biodiversity components has been defined for each phase of the Project within the ESIA framework, including additional field studies for data collection.

9) **Environmental and Social Management System:** The Project will implement an Environmental and Social Management System that meets the minimum requirements outlined in the ESIA study.

10) **Resettlement Action Plan (RAP):** A “Resettlement Action Plan” will be developed and implemented to minimize impacts on Project Affected Persons (PAPs). The RAP will detail measures and practices in line with Project commitments regarding entitlements, compensation rights, and land user status.

The mitigation measures designed to minimize the environmental and social impacts of the Project are detailed in the relevant sections of this report.

The requirements of an Environmental and Social Management System are also provided as part of the Environmental and Social Impact Study focusing on:

- Environmental and Social Management System Structure
- Environmental and Social Management Plan
- Labour Issues and Health & Safety Management
  - Labour Conditions
  - Occupational Health and Safety
  - Community Health and Safety

## 11.2 Residual Impacts

The surveys, studies, and impact assessments conducted by EPC Contractor/ÇOK A.Ş. have facilitated the development of robust mitigation measures for residual impacts. As outlined in Chapter 5, the Residual Impact Value (RIV) is determined by considering both the impact value and the effectiveness of the implemented mitigation measures in reducing negative outcomes or enhancing positive outcomes from Project

Actions/Impact Factors. The RIVs reflect the overall impact on each component, representing a synthesis of residual impacts across all impact factors associated with Project actions.

Based on the assessment detailed in Chapter 7, the overall residual impact value for each component is summarized in the following sections.

### 11.2.1 Physical

The overall residual impact is assessed for the construction phase of the Project and rated as low for *Geology and Geomorphology* since there will be no blasting and major structural changes for the Project. For S*oil and Subsoil* components impact is assessed as negligible and low since the proposed mitigation measures will have a high effect for minimizing the impact and actual impact on soil corresponds mainly in construction phase (very limited period). Especially for the soil component, to prevent adverse impacts, mitigation measures listed in Section 7.1.3 should be followed and pollution prevention techniques will be implemented. Soil in each segment of the construction will be assessed for indicators of contamination such as texture, odor and colour. If soil contamination is suspected during site clearance, excavation or construction, a detailed assessment will be conducted. Pollution Prevention Procedure will be implemented and updated when required.

*Hydrology and Surface Water Quality and Hydrogeology and Groundwater Quality components are* assessed as negligible and low during construction and operation phases. In order to mitigate these residual impacts, detailed measures have been developed as presented in Chapter 7.1.4 and 7.1.5. Water and Wastewater Management Plan and other related plans will be developed and implemented for the Project. The mitigation measures offered on “LA113 Road Drainage and the Water Environment by Highways England” will be applied for the physical protection of receptors in case of any accidental spill. Risk assessment defined in LA113 will be performed by the Operations & Maintenance Subcontractor/Team. A Groundwater Management Plan will be prepared and implemented, and the impact factor of groundwater depletion will be assessed before any decisions are made regarding water supply. Flood risk assessment report (with proposed drainage structures) will be prepared for the Project and fully implemented.

The overall residual impact on *Air Quality* is assessed as negligible during both the construction and operation phases. Periodic monitoring, especially during the construction phase, is essential to track impacts related to dust emissions. A monthly monitoring campaign will be conducted during the construction phase at baseline locations near active construction sites and operational facilities. The results will be compared with the Air Pollution Regulation and the IFC General EHS Guidelines – Air Emission and Air Quality. Additional mitigation measures will be implemented as needed.

The overall residual impact for *Noise and Vibration* is assessed low for noise and negligible and low for vibration for construction and operation phase respectively based on the outputs of the modelling study. During the construction and operation phases of the Project, a monitoring programme of noise will be in place. The monitoring campaign will be conducted by 48 hours continuous noise measurements at the locations on quarterly basis. Blasting is not planned for the Project, if there is a change in design and blasting is required, MoC procedure will be followed and during the blasting activities, vibration measurement studies will be performed for frequency ranges on the closest receptors to the blasting locations. Surveys of existing building structure and integrity at receptors close to the blasting sites will be undertaken both prior to any blasting activity and monthly during the construction phase.

The overall residual impact for *Traffic* is assessed as negligible for increased vehicular traffic and low for interruption of roads and limitation of traffic impact factors for construction phase. Mitigation measures listed on the Section 7.1.11 will be strictly followed in order to prevent any harm to workers and community related to traffic. Continuous stakeholder engagement process and grievance mechanism will be in place. There will be

positive impact of the traffic component in the operation phase based on the decreased traffic load in lower standard roads.

The overall residual impact for V*isual* component assessed as low for construction phase and medium for operation phase. Monitoring of visual impacts includes monitoring of community and stakeholders. Related grievances will be recorded and dealt with via the Grievance Mechanism, within the Project's Stakeholder Engagement Plan, continuously in construction and operation phases.

In order to mitigate these overall physical residual impacts, they will be managed through specific management plans such as such as Soil and Topsoil Management Plan, Soil Erosion, Reinstatement and Landscape Management Plan, Quarries and Associated Facilities Management Plan, Hazardous Materials Management Plan, Resource Efficiency and Pollution Prevention Plan, Water and Wastewater Management Plan, Water Crossing Plan, Air Quality and Greenhouse Gas Management Plan, Noise and Vibration Management Plan, Traffic Management Plan and Stakeholder Engagement Plan.

### 11.2.2 Biological

For *natural habitats*, the overall residual impact is assessed as low for the "vegetation and topsoil removal" impact factor and negligible for all other factors during the construction phase. During the operation phase, all residual impacts are assessed as low, except for the "emission of light" impact factor, which is considered negligible.

For *critical habitats*, the overall residual impact is assessed as low for both flora and fauna species during the construction phase. In the operation phase, the residual impact on flora remains low, while the impact on fauna is expected to range from negligible to medium due to factors such as the "presence of new buildings/infrastructures" and "motorway traffic."

Detailed mitigation measures for biological components presented in Section 7.2 and these mitigation measures will be strictly followed. Biodiversity Action Plan will be developed and implemented for the Project. Areas cleared during construction for temporary use, such as borrow pit, camp areas, concrete plants and storage areas, will be restored, as soon as possible, with the goal of producing a stable vegetative cover to minimize erosion, dust and spreading of invasive alien species, and the aim of re-establish the original habitat with a positive impact on biodiversity. A Biodiversity Action Plan will include appropriate offset measure to ensure No Net Loss, or preferably Net Gain, depending on the residual impacts identified during the additional studies and monitoring.

Monitoring and additional site survey will be implemented for biological components in accordance with the recommendations listed in the Section 7.2 of the ESIA.

### 11.2.3 Social

The possible social impacts of the Project will be both positive and negative.

The impact on *Population and Demography* is low for construction phase and negligible for operation phase with the proposed mitigation measures. To manage these impacts management system documentation such as Employment Policy Statement and Local Content Procedure will be developed and implemented.

Unlike other Project components, the *Economy and Employment* are expected to have a positive impact on both the construction and operation periods. *Contribution on national economy* is one of the main positive impacts of the Project for the operation phase. *Demand for workforce* and *demand for goods* are other positive impacts of the Project for both construction and operation phases.

The impacts on *Land Use and Land-based Livelihoods* are medium for all impact assessed for construction phase except access to ecosystem services which is rated as negligible with given mitigation measures. For

the operation phase Access to land (agricultural and pasturelands) impact assessed as medium. RAP will be prepared and implemented to bridge thin order to mitigate these impacts. Physical and economic displacement impacts will be minimized for the Project in order to manage the impacts on the PAPs.

The overall impacts on *Community Health and Safety* are considered negligible to low with the proposed mitigation measures. The “Improved Road Safety and Shortened Travel Time” impact factor is expected to have a very high positive effect on community health and safety during operation phase. To manage impacts on the community, the Community Health, Safety, and Security Procedure for the Malkara-Çanakkale Motorway Project, developed by ÇOK A.Ş., will be reviewed, revised in accordance with Project Standards, updated, and implemented accordingly.

The impact on *Labour and Working Conditions* is low with the implementation of the defined mitigation measures. A labour management plan and human resources policy that respects wage standards, regulates working hours, and supports freedom of association and employee advancement will be implemented. The policy will also eliminate child and forced labour, as well as discrimination based on religion, language, gender, or social status, and will address bullying and harassment.

Although the overall residual negative impacts of the *Infrastructure, Utilities, and Services* during the construction phase are negligible to low, the positive impact of transportation activities during the operation phase is rated as very high. This is because the project will provide long-term accessibility to several provinces in the region, and the use of the motorway is also expected to reduce travel time.

The impact on G*ender Issues* and V*ulnerable Groups* are assessed as low after implementation of the proposed mitigation measures. EPC Contractor/ÇOK A.Ş. will strictly monitor these issues and engage continuously with its stakeholders to minimize the impact on gender issues and vulnerable groups. Related grievances will be recorded and dealt with via the Grievance Mechanism, within the Project’s Stakeholder Engagement Plan, continuously in construction and operation phases.

In order to mitigate these overall social residual impacts several mechanisms will be put in place, such as Stakeholder Engagement Plan, Grievance Mechanism, RAP and specific management plans such as Supply Chain Management Plan, Subcontractor Management Plan, Community Health, Safety and Security Procedure, Camp Site Management Plan (including Workers' Accommodation).

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**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix A - Project Standards*

Submitted to:

**ÇOK A.Ş.**

1915 Çanakkale Ana Kontrol Merkezi Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, Çanakkale

Submitted by:

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**APPENDIX A**

# PROJECT STANDARDS

**Current Environmental Laws and Regulations in Türkiye relevant to the Project**

| Current Environmental Laws and Regulations | Date and No of Issuing Official Gazette |
|---|---|
| Environment Law | 11.08.1983, 18132 |
| **Permitting** | |
| Regulation on Environmental Impact Assessment | 29.07.2022, 31907 |
| Regulation on Environmental Auditing | 21.11.2008, 27061 |
| Regulation on Environmental Permits and Licenses | 10.09.2014, 29115 |
| **Air Quality** | |
| Regulation on Control of Air Pollution caused by Heating | 13.01.2005, 25699 |
| Regulation on Assessment and Management of Air Quality | 06.06.2008, 26898 |
| Regulation on Decreasing the Ozone Depleting Materials | 07.04.2017, 30031 |
| Regulation on Control of Exhaust Gas Emission | 11.03.2017, 30004 |
| Regulation on Control of Industrial Air Pollution | 03.07.2009, 27277 |
| Regulation on the Reduction in the Sulphur Content of Some Fuel Types | 06.10.2009, 27368 |
| Regulation on Odour Causing Emissions | 19.07.2013, 28712 |
| **Water Quality** | |
| Regulation on Water Pollution Control | 31.12.2004, 25687 |
| Groundwater Law (No. 167) | 23.12.1960, 10688 |
| Regulation on Protection of Groundwater against Pollution and Deterioration | 07.04.2012, 28257 |
| Regulation on Protection of Wetlands | 04.04.2014, 28962 |
| Regulation on Control of Pollution Caused by Dangerous Substances in Water and its Environment | 26.11.2005, 26005 |
| Regulation on Urban Wastewater Treatment | 08.01.2006, 26047 |
| Regulation on Water Intended for Human Consumption | 17.02.2005, 25730 |
| Regulation on Surface Water Quality | 30.11.2012 28483 |
| Regulation on Water Conservation against Pollution Caused by Nitrates from Agricultural Sources | 23.07.2016, 29779 |

| Current Environmental Laws and Regulations | Date and No of Issuing Official Gazette |
|---|---|
| **Soil Quality** | |
| Regulation on Pollutant Release and Transport Registration | 04.12.2021, 31679 |
| Law on Protection of Soil and Land Use (No. 5403) | 19.07.2005, 25880 |
| Regulation on Control of Soil Pollution and Contaminated Lands by Point Sources | 08.06.2010, 27605 |
| **Waste Management** | |
| Regulation on Waste Management | 02.04.2015, 29314 |
| Regulation on Control of Excavation Soil, Construction and Demolition Wastes | 18.03.2004, 25406 |
| Regulation on Control of Waste Batteries and Accumulators | 31.08.2004, 25569 |
| Regulation on Control of Vegetative Oils | 06.06.2015, 29378 |
| Regulation on Control of Medical Wastes | 25.01.2017, 29959 |
| Regulation on Control of End-of-Life Tires | 25.11.2006, 26357 |
| Regulation on Control of Waste Electrical and Electronic Goods | 22.05. 2012, 22300 |
| Regulation on Management of Waste Oils | 21.12.2019, 30985 |
| Regulation on Control of End-of-Life Vehicles | 30.12.2009, 27448 |
| Regulation on Landfills (Regular Storage of Wastes) | 26.03.2010, 27533 |
| Regulation on Control of Packaging Wastes | 26.06.2021, 31523 |
| Regulation on Control of Polychlorinated Biphenyls (PCBs) and Polychlorinated Terphenyls (PCTs) | 27.12.2007, 26739 |
| Regulation on Management of Radioactive Wastes and Spent Fuel | 07.11.2023, 32362 |
| Regulation on Zero Waste | 12.7.2019, 30829 |
| **Chemicals Management** | |
| Regulation on the Prevention of Major Industrial Accidents and Reducing Their Effects | 2.3.2019, 30702 |
| Regulation on the Transportation of Dangerous Goods by Road | 24.04.2019, 30754 |
| Regulation on Safe Transportation of Radioactive Materials | 08.07.2005, 25869 |

| Current Environmental Laws and Regulations | Date and No of Issuing Official Gazette |
|---|---|
| Regulation on the Classification, Packaging, and Labelling of Materials and Mixtures | 11.12.2013, 28848 |
| Regulation on Registration, Evaluation, Permission and Restriction of Chemicals | 23.06.2017, 30105 |
| **Noise Management** | |
| Regulation on Management of Environmental Noise | 30.11.2022, 32029 |
| Regulation Related to Noise Emissions by Equipment for Outdoor Use | 30.12.2006, 26392 |
| Type Approval Regulation on Exterior Noise Emissions and Exhaust Systems of Motor Vehicles | 30.11.2000, 24246 |
| **Nature Conservation and Biodiversity** | |
| Regulation on Wildlife Protection and Wildlife Enhancement Areas | 08.11.2004, 25637 |
| Law on Forestry (No. 6831) | 08.09.1956, 9402 |
| National Parks Law (No. 2873) | 11.08.1983, 18132 |
| **Cultural Heritage** | |
| Law on Preservation of Cultural and Natural Assets (Law No. 2863) | 23.07.1983, 18113 |
| Principal Decision (No. 658) | - |
| Law on the Approval of the Convention for the Protection of the Intangible Cultural Heritage (No. 5448) | 19/01/2006 |
| **Land Use** | |
| Law on Soil Preservation and Land Utilization (No. 5403) | 19.07.2005, 25880 |
| Pasture Law (No. 4342) | 28.02.1998, 23272 |
| Expropriation Law (No. 2942) | 08.11.1983, 18215 |
| Settlement Law (No. 5543) | 26.09.2006, 26301 |
| Reconstruction Law (No. 3194) | 09.05.1985, 18749 |
| **Resources Management** | |
| Energy Efficiency Law (No. 5627) | 02.05.2007, 26510 |
| Regulation on the Improvement of the Energy Sources and the Efficiency in the Energy Usage | 27.10.2011, 28097 |

**Current Labour and H&S Laws and Regulations in Türkiye**

| Existing Labour and H&S Laws and Regulations | Date and No of Issuing Official Gazette |
|---|---|
| **Laws** | |
| The Labour Law – No. 4857<br>*(Aims to regulate the working conditions and work-related rights and obligations of employers and employees working within the confines of an employment contract.)* | 10.06.2003, 25134 |
| The Occupational Health and Safety Law - Law No. 6331 | 30.06.2012, 28339 |
| **Regulations** | |
| Regulation on Safety and Health Requirements Working with Display Screen Equipment | 16.04.2013, 28620 |
| Regulation on Protection of Workers from the Risks of Vibration | 22.08.2013, 28743 |
| Regulation on Prevention of Workers from Risks Created from Noise | 28.07.2013, 28721 |
| Regulation on Management of Dust | 05.11.2013, 28812 |
| Regulation on Health and Safety Signs | 11.09.2013, 28762 |
| Regulation on Health and Safety at Construction Sites | 05.10.2013, 28786 |
| Regulation on Protection of Workers from the Risk of Explosive Media | 30.04.2013, 28633 |
| Regulation on Health and Safety Precautions Regarding Working with Asbestos | 25.01.2013, 28539 |
| Regulation on Manual Handling | 24.07.2013, 28717 |
| Regulation on Principles and Procedures for Health and Safety Training of Employees | 15.05.2013, 28648 |
| Regulation on Use of Personnel Protective Equipment in Workplaces | 02.07.2013, 28695 |
| Regulation on Health and Safety Conditions Regarding Use of Work Equipment | 25.04.2013, 28628 |
| Regulation on Health and Safety Regarding Temporary Works | 23.08.2013, 28744 |
| Personnel Protective Equipment Regulation | 01.05.2019, 30761 |
| Regulation on Health and Safety Precautions Regarding Working with Chemicals | 12.08.2013, 28733 |
| Regulations on the Prevention of Biological Exposure Risks | 15.06.2013, 28678 |
| Regulation on the Employment of Pregnant or Lactating Women, Children's Care Homes and Breastfeeding Rooms | 16.08.2013, 28737 |

| Existing Labour and H&S Laws and Regulations | Date and No of Issuing Official Gazette |
|---|---|
| Regulation on the Procedures and Principles of the Employment of Children's and Young Workers | 06.04.2004, 25425 |
| Regulation on Health and Safety Services | 29.12.2012, 28512 |
| Regulation on Health and Safety Risk Assessment | 29.12.2012, 28512 |
| First Aid Regulation | 29.7.2015, 29429 |
| Regulation on Protection of Buildings Against Fire | 19.12.2007, 26735 |
| Regulation on Work Stoppage in Workplaces | 30.03.2013, 28603 |
| Regulation on Emergency Cases in Workplaces | 18.06.2013, 28681 |
| Regulation on Health and Safety Precautions Regarding Working with Cancerogenic and Mutagenic Substances | 06.08.2013, 28730 |
| Regulation on Equipment and Protective Systems Used in Potentially Explosive Atmospheres | 30.6.2016, 29758 |
| Regulation on Laboratories Conducting Occupational Hygiene Measurement, Testing and Analysis | 24.1.2017, 29958 |
| Regulation on Health and Safety Measures to be Taken in Workplace Buildings and Annexes. | 17.7.2013, 28710 |
| Regulation on the Duty, Authority, Responsibility and Training of Occupational Safety Specialists | 29.12.2012, 28512 |
| Regulation on the Duty, Authority, Responsibility and Training of Occupational Physicians | 20.7.2013, 28713 |

**Other Applicable Legislation Relevant to the Project**

| Other Applicable Legislation Relevant to the Project | Date and No of Issuing Official Gazette |
|---|---|
| General Public Health Law (No. 1593) | 24.04.1930, 1489 |
| Law on the Protection of Cemeteries (No. 3998) | 13.06.1994, 21959 |
| Regulation on Preparation of Spatial Plans | 14.06.2014, 29030 |
| Unplanned Areas Construction Regulation | 02.11.1985, 18916 |
| Regulation on Workplace Establishment and Operating Licenses | 10.08.2005, 25902 |
| Regulation on Buildings to be Built in Disaster Areas" | 14.07.2007, 26582 |
| Türkiye Building Earthquake Regulation | 18.03.2018, 30364 |
| Disaster Regulation for Highway Engineering Structures | 07.12.2006 26369 |
| Türkiye Bridge Earthquake Regulation | 06.10.2020 31266 |
| Türkiye Insulated and Damping Bridge and Viaducts Earthquake Regulation | 06.10.2020 31266 |
| Regulation on the Obtaining, Processing and Control of the Sand, Gravel and Similar Materials | 08.12.2007, 26724 |

**International Agreements which Türkiye is a Party**

| International Convention / Protocol | Date and No of Issuing Turkish Official Gazette |
|---|---|
| European Cultural Convention; 19.12.1954 | 17.06.1957, 9635 |
| International Convention for the Establishment of the European and Mediterranean Plan Protection Organization; Paris, 1951 | 10.08.1965 |
| The Convention for the Protection of Cultural Property in the Event of Armed Conflict; 14.04.1954 | 08.11.1965, 12145 |
| International Convention for the Protection of Birds; Paris, 1959 | 17.12.1966, 12480 |
| Convention on Legal Responsibilities about the Nuclear Energy Field; 29.1.1960, and its addendum protocol dated 28.01.1964 | 13.06.1967, 12620 |
| Agreement on an International Energy Program; Paris, 1974 | 04.05.1981 |
| Convention for the Protection of the World Cultural and Natural Heritage; Paris, 1972 | 14.2.1983, 17959 |
| Convention on Long-Range Transboundary Air Pollution; Geneva, 1979 | 23.03.1983,17996 |
| The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention); Bern, opened for signature on 19.09.1979, entered into force on 01.06.1982 | Ratification date: 02.05.1984<br>Entered into force: 01.09.1984 |
| Protocol to the Convention on Long-Range Transboundary Air Pollution on the Financing of the Co-operative Program for Monitoring and Evaluation of the Long-Range Transmission of Air Pollutants in Europe; Geneva, 1984 | 23.07.1985, 18820 |
| Convention on the Control of Transboundary Movements of Hazardous Waste and Disposal; Basel, 22.03.1989 | 15.05.1994, 21935 |
| The Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention); entered into force on 21.12.1975 | 17.05.1994, 21937 |
| Montreal Protocol on Substances That Deplete the Ozone Layer; Montreal, opened for signature on 16.09.1987, entered into force on 1.1.1989<br>( revisions: 1990,London; 1991,Nairobi; 1992,Copenhagen; 1993,Bangkok; 1995,Vienna; 1997,Montreal; and 1999,Beijing) | 28.12.1994, 22155 |
| Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); opened for signature on 3.3.1973, entered into force on 1.7.1975 | 20.06.1996, 22672 (entered into force on 22.12.1996) |
| United Nations Convention to Combat Desertification; Paris, 17.6.1994, entered into force in December 1996 | 1997 |

| International Convention / Protocol | Date and No of Issuing Turkish Official Gazette |
|---|---|
| Biodiversity Convention; opened for signature at the Earth Summit in Rio de Janeiro on 5.6.1992, entered into force on 29.12.1993 | 27.12.1996, 22860 |
| Convention on the Transboundary Effects of Industrial Accidents | 18.03.1992 |
| The Stockholm Convention on Persistent Organic Pollutants | 22.05.2001 |
| United Nations Framework Convention on Climate Change; 2004, and Kyoto Protocol on Global Warming; 2008<br><br>*General principle of Kyoto is the signatory parties should decrease their GHG emissions by 5.2% of the 2009 amount till the end of 2012. After 2012, a new agreement and new emission limits will come into picture.* | Turkish Parliament accepted to be a signatory of Kyoto Protocol in February 2009. However, Türkiye is not a party in the Protocol, thus has no commitment, until the end of 2012. |

**Relevant European Regulations**

| European Regulations | |
|---|---|
| **Environmental Issues** | |
| **Impact Assessment** | ■ Council Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment |
| **Air Quality** | ■ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control). Directive 2010/75/EU replaces definitively, with effect from 7 January 2014<br>■ Directive 1999/13/EC on reducing emissions of volatile organic compounds (VOCs)<br>■ Directive 2008/1/EC concerning integrated pollution prevention and control<br>■ Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe<br>■ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC<br>■ Regulation (EC) No 2037/2000 of the European Parliament and of the Council of 29 June 2000 on substances that deplete the ozone layer<br>■ Council Directive 1999/32/EC of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC<br>■ Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants |
| **Energy Conservation** | ■ 32012L0027: Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC Text with EEA relevance<br>■ Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control<br>■ EC/JRC 2008: IPPC Reference Document on Best Available Techniques for Energy Efficiency. June 2008 |
| **Water and Wastewater Quality** | ■ Council Directive 91/271/EEC of 21 May 1991 Concerning Urban Wastewater Treatment<br>■ Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption<br>■ Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration<br>■ Council Directive 80/68/EEC of 17 December 1979 on the protection of groundwater against pollution caused by certain dangerous substances<br>■ Directive 2006/11/EC of the European Parliament and of the Council of 15 February 2006 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community |

| European Regulations | |
|---|---|
| | ■ Directive 2008/105/EC of the European Parliament and of the Council of 16 December 2008 on environmental quality standards in the field of water policy, amending and subsequently repealing Council Directives 82/176/EEC, 83/513/EEC, 84/156/EEC, 84/491/EEC, 86/280/EEC and amending Directive 2000/60/EC of the European Parliament and of the Council |
| **Water Conservation** | ■ Directive 2006/11/EC of the European Parliament and of the Council of 15 February 2006 on pollution caused by certain dangerous substances discharged into the aquatic environment of the Community<br>■ Council Directive of 12 June 1986 on limit values and quality objectives for discharges of certain dangerous substances included in List I of the Annex to Directive 76/464/EEC |
| **Hazardous Materials Management** | ■ Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC<br>■ Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006<br>■ Council Directive 67/548/EEC of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances<br>■ Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods |
| **Waste Management** | ■ Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste<br>■ Directive 94/62/EC of the European Parliament and of the Council of 20 December 1994 on packaging and packaging waste<br>■ Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE)<br>■ Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment<br>■ Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC<br>■ Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives<br>■ Directive 2000/53/EC of the European Parliament and of 18 September 2000 on end-of life vehicles |

| European Regulations | |
|---|---|
| | ■ 32012L0019: Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE) Text with EEA relevance |
| **Noise** | ■ Council Directive of 6 February 1970 on the approximation of the laws of the Member States relating to the permissible sound level and the exhaust system of motor vehicles<br>■ Directive 2000/14/EC of the European Parliament and of the Council of 8 May 2000 on the approximation of the laws of the Member States relating to the noise emission in the environment by equipment for use outdoors<br>■ Directive 2002/49/EC of the European Parliament and of the Council of 25 June 2002 relating to the assessment and management of environmental noise |
| **Soil Quality** | ■ Directive 2004/35/CE of 21 April 2004 on environmental liability regarding the prevention and remedying of environmental damage |
| **Nature Conservation and Biodiversity** | ■ Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora<br>■ Council Decision 98/145/EC of 12 February 1998 on the approval, on behalf of the European Community, of the amendments to Appendices I and II to the Bonn Convention on the conservation of migratory species of wild animals as decided by the fifth meeting of the Conference of the parties to the Convention<br>■ Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds |
| **Occupational and Community Health and Safety Issues** | |
| **Occupational and Community Health and Safety** | ■ Council Directive 89/391/EEC of 12 June 1989 on the introduction of measures to encourage improvements in the safety and health of workers at work<br>■ Council Directive 89/654/EEC of 30 November 1989 concerning the minimum safety and health requirements for the workplace<br>■ Council Directive 89/655/EEC of 30 November 1989 concerning the minimum safety and health requirements for the use of work equipment by workers at work (amending directives 95/63/EC and 2001/45/EC)<br>■ Council Directive 89/656/EEC of 30 November 1989 on the minimum health and safety requirements for the use by workers of personal protective equipment at the workplace<br>■ Council Directive 83/477/EEC of 19 September 1983 on the protection of workers from the risks related to exposure to asbestos at work<br>■ Council Directive 90/269/EEC of 29 May 1990 on the minimum health and safety requirements for the manual handling of loads where there is a risk particularly of back injury to workers<br>■ Council Directive 90/270/EEC of 29 May 1990 on the minimum safety and health requirements for work with display screen equipment |

| European Regulations | |
|---|---|
| | ■ Directive 2004/37/EC of the European Parliament and of the Council of 29 April 2004 on the protection of workers from the risks related to exposure to carcinogens or mutagens at work<br>■ Directive 2000/54/EC of the European Parliament and of the Council of 18 September 2000 on the protection of workers from risks related to exposure to biological agents at work<br>■ Council Directive 92/57/EEC of 24 June 1992 on the implementation of minimum safety and health requirements at temporary or mobile construction sites<br>■ Council Directive 92/58/EEC of 24 June 1992 on the minimum requirements for the provision of safety and/or health signs at work<br>■ Council Directive 92/85/EEC of 19 October 1992 on the introduction of measures to encourage improvements in the safety and health at work of pregnant workers and workers who have recently given birth or are breastfeeding<br>■ Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 on minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres<br>■ Directive 2002/44/EC of the European Parliament and of the Council of 25 June 2002 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (vibration)<br>■ Directive 2003/10/EC of the European Parliament and of the Council of 6 February 2003 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (noise)<br>■ Directive 2004/40/EC of the European Parliament and of the Council of 29 April 2004 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields)<br>■ Commission Directive 2000/39/EC of 8 June 2000 establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work<br>■ Council Directive 80/1107/EEC of 27 November 1980 on the protection of workers from the risks related to exposure to chemical, physical and biological agents at work<br>■ Council Directive 88/364/EEC of 9 June 1988 on the protection of workers by the banning of certain specified agents and/or certain work activities<br>■ Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances<br>■ |
| **Other** | |
| **Other** | ■ Council Directive of 27 June 1985 on the assessment of the effects of certain public and private projects on the environment<br>■ Directive 2008/1/EC of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control |

| European Regulations | |
|---|---|
| | ■ Directive 2010/75/EC of the European Parliament and of the Council of 24 November 2010 concerning industrial emissions (integrated pollution prevention and control) |

**Relevant International labour Organization ("ILO") conventions ratified by Türkiye:**

- Unemployment Convention, 1919
- Right of Association (Agriculture) Convention, 1921
- Weekly Rest (Industry) Convention, 1921
- Minimum Age (Trimmers and Stokers) Convention, 1921
- Minimum Wage-Fixing Machinery Convention, 1928
- Forced Labour Convention, 1930
- Fee-Charging Employment Agencies Convention, 1933
- Workmen's Compensation (Occupational Diseases) Convention (Revised), 1934
- Underground Work (Women) Convention, 1935
- Shipowners' Liability (Sick and Injured Seamen) Convention, 1936
- Minimum Age (Sea) Convention (Revised), 1936
- Minimum Age (Industry) Convention (Revised), 1937
- Food and Catering (Ships' Crews) Convention, 1946
- Certification of Ships' Cooks Convention, 1946
- Medical Examination (Seafarers Convention, 1946
- Medical Examination of Young Persons (Industry) Convention, 1946
- Final Articles Revision Convention, 1946
- labour Inspection Convention, 1947
- Freedom of Association and Protection of the Right to Organise Convention, 1948
- Employment Service Convention, 1948
- Accommodation of Crews Convention (Revised), 1949
- Lobar Clauses (Public Contracts) Convention, 1949
- Protection of Wages Convention, 1949
- Fee-Charging Employment Agencies Convention (Revised), 1949
- Right to Organise and Collective Bargaining Convention, 1949

- Minimum Wage Fixing Machinery (Agriculture) Convention, 1951
- Equal Remuneration Convention, 1951
- Social Security (Minimum Standards) Convention, 1952
- Abolition of Forced Lobar Convention, 1957
- Seafarers' Identity Documents Convention, 1958
- Discrimination (Employment and Occupation) Convention, 1958
- Radiation Protection Convention, 1960
- Final Articles Revision Convention, 1961
- Equality of Treatment (Social Security Convention, 1962
- Guarding of Machinery Convention, 1963
- Employment Policy Convention, 1964
- Minimum Age (Underground Work) Convention, 1965
- Maximum Weight Convention, 1967
- Accommodation of Crews (Supplementary Provisions) Convention, 1970
- Prevention of Accidents (Seafarers) Convention, 1970
- Workers' Representatives Convention, 1971
- Minimum Age Convention, 1973
- Human Resources Development Convention, 1975
- Tripartite Consultation (International Lobar Standards) Convention, 1976
- Seafarers' Annual Leave with Pay Convention, 1976
- labour Relations (Public Service) Convention, 1978
- Occupational Safety and Health (Dock Work) Convention, 1979
- Hours of Work and Rest Periods (Road Transport) Convention, 1979
- Occupational Safety and Health Convention, 1981
- Termination of Employment Convention, 1982
- Vocational Rehabilitation and Employment (Disabled Persons) Convention, 1983
- Occupational Health Services Convention, 1985
- Health Protection and Medical Care (Seafarers) Convention, 1987
- Repatriation of Seafarers Convention (Revised), 1987
- Safety and Health in Construction Convention, 1988
- Safety and Health in Mines Convention, 1995

- Worst Forms of Child Lobar Convention, 1999
- Promotional Framework for Occupational Safety and Health Convention, 2006

## Air Quality

**Ambient Air Quality Standards**

| Pollutant | Time/ Averaging Period | Maximum Allowable Limit | | | |
|---|---|---|---|---|---|
| | | EU[1] | Turkish[2] | IFC / WHO[3] | Project Standards |
| **$SO_2$ (µg/$m^3$)** | Hourly | 350 | 470 (for 2015)<br>440 (for 2016)<br>410 (for 2017)<br>380 (for 2018)<br>350 (for 2019-after) | - | 350 |
| | 24 hour | 125 | 225 (for 2015)<br>200 (for 2016)<br>175 (for 2017)<br>150 (for 2018)<br>125 (for 2019-2023) | 125 (Interim target-1)<br>50 (Interim target-2)<br>20 (guideline) | 125 |
| | LTLV[5] | - | 60 | - | 60 |
| | Yearly and winter season (Oct 1st – March 31st) (for wildlife and ecosystem) | - | 20 | - | 20 |
| **$NO_2$ (µg/$m^3$)** | Hourly | 200 | 280 (for 2016)<br>270 (for 2017)<br>260 (for 2018)<br>250 (for 2019-2023)<br>200 (for 2024 and after) | 200 (guideline) | 200 |
| | Yearly | 40 | 52 (for 2016)<br>48 (for 2017)<br>44 (for 2018)<br>40 (for 2019 and after) | 40 (guideline) | 40 |

| Pollutant | Time/ Averaging Period | Maximum Allowable Limit | | | |
|---|---|---|---|---|---|
| | | EU[1] | Turkish[2] | IFC / WHO[3] | Project Standards |
| **$PM_{10}$ ($\mu g/m^3$)** | 24 hour | 50 | 80 (for 2016)<br>70 (for 2017)<br>60 (for 2018)<br>50 (for 2019-2023) | 150 (Interim target-1)<br>100 (Interim target-2)<br>75 (Interim target-3)<br>50 (guideline) | 50 |
| | Yearly | 40 | 52 (for 2016)<br>48 (for 2017)<br>44 (for 2018)<br>40 (for 2019-2023) | 70 (Interim target-1)<br>50 (Interim target-2)<br>30 (Interim target-3)<br>20 (guideline) | 40 |
| **Fine particles ($PM_{2.5}$, $\mu g/m^3$)** | Yearly | 25 (effective from 1 January 2015)<br>20 (effective from 1 January 2020)[1] | - | 35 (Interim target-1)<br>25 (Interim target-2)<br>15 (Interim target-3)<br>10 (guideline) | 20 |
| | 24 hour | - | - | 75 (Interim target-1)<br>50 (Interim target-2)<br>37.5 (Interim target-3)<br>25 (guideline) | 25 |
| **Settled Dust ($mg/m^2/day$)** | 24 hour | - | 390 | - | 390 |
| | Yearly | 350 | 210 | - | 210 |

[1] Directive 2008/50/EC, 21 May 2008, ambient air quality and cleaner air

[2] Regulation on Control of Industrial Air Pollution

[3] IFC General Environmental, Health, and Safety (EHS) Guidelines (WHO stands for World Health Organization)

[4] Heavy metals are maximum allowable limits from the total content of the PM10 fraction averaged over one year. Limits are from Directive 2004/107/EC

[5] LTLV: Long term limit value

**Limits for Atmospheric Emissions from Stationary Sources**

| Source | Pollutant | Turkish[1] | IFC[2] | Project Standards |
|---|---|---|---|---|
| Diesel Generators | $NO_x$ ($mg/Nm^3$) | 1,000 | 1,460[3]<br>1,850[4] | 1,000 |
| | $SO_2$ ($mg/Nm^3$) | 900 | -[5] | 900 |

| Source | Pollutant | Turkish[1] | IFC[2] | Project Standards |
|---|---|---|---|---|
| | PM (mg/Nm$^3$) | 75 | 50 | 50 |
| | CO (mg/Nm$^3$) | 250 | - | 250 |

[1] Regulation on Control of Industrial Air Pollution
[2] IFC General Environmental, Health, and Safety (EHS) Guidelines
[3] IFC Standard: exhaust bore size diameter [mm] < 400
[4] IFC Standard: exhaust bore size diameter [mm] > or = 400
[5] 1.5 percent Sulphur or up to 3.0 percent Sulphur

## Water Quality

**Surface Water Chemical and Physiochemical Parameters Criteria[1]**

| Water Quality Parameters | | Water Quality Classes[(a)] | | |
|---|---|---|---|---|
| | | I (very good) | II (good) | III (mediocre) |
| Colour (m$^{-1}$) | RES 436 nm: | ≤ 1.5 | 3.0 | > 4.3 |
| | RES 525 nm: | ≤ 1.2 | 2.4 | > 3.7 |
| | RES 620 nm: | ≤ 0.8 | 1.7 | 2.5 |
| pH | | 6-9 | 6-9 | 6-9 |
| Conductivity (µS/cm) | | < 400 | 1000 | > 1000 |
| Oil and Grease (mg/L) | | < 0.2 | 0.3 | > 0.3 |
| Dissolved Oxygen (mg/L) | | > 8 | 6 | < 6 |
| Chemical Oxygen Demand (COD) (mg/L) | | < 25 | 50 | > 50 |
| Biochemical Oxygen Demand ($BOD_5$) (mg/L) | | < 4 | 8 | > 8 |
| Ammonium Nitrogen (mg $NH_4^+$-N/L) | | < 0.2 | 1 | > 1 |
| Nitrate-N (mg $NO_3^-$-N/L) | | < 3 | 10 | > 10 |
| Total Kjeldahl nitrogen (mg N/L) [(b)] | | < 0.5 | 1.5 | > 1.5 |
| Total Nitrogen (mg N/L) [(c)] | | < 3.5 | 11.5 | > 11.5 |
| Orthophosphate Phosphorus (mg o-$PO_4$-P/L) | | < 0.05 | 0.16 | > 0.16 |
| Total Phosphorous (mg P/L) | | < 0.08 | 0.2 | > 0.2 |
| Flouride (µg/L) | | ≤ 1000 | 1500 | > 1500 |
| Manganese (µg/L) | | ≤ 100 | 500 | > 500 |
| Selenium (µg/L) | | ≤ 10 | 15 | > 15 |
| Sulphur (µg/L) | | ≤ 2 | 5 | > 5 |

[1]Appendix 5 Table 2, Regulation on Surface Water Quality, Changed in the Official Gazette on 10/08/2016- No. 29797

(a) Water use purposes according to their quality classes:

**I. Class-** High quality water (I. class water quality means the condition of the water is "Very Good".);

1) Surface water with a high potential of being drinking water,
2) Water that can be used for recreational purposes, including those such as swimming that include body contact,
3) Water that can be used for trout farming,
4) Water that can be used for animal husbandry and agricultural needs.

**II. Class-** Water with low pollution levels (II. Class water quality means the condition of the water is "Good".);

1) Surface Waters with potential to be drinking water,
2) Water which can be used for recreational purposes,
3) Water which can be used for farming fish other than trout,
4) Irrigation water upon the condition that it reaches the criteria of the irrigation water quality of the respective legislation.

**III. Class-** Polluted water (III. Class water quality means the condition of the water is "Mediocre";

Facilities needing water, with the exception of those for food and textile, once the water has undergone the appropriate treatment it can be used for water product farming and industry.

(b) TKN: $NH_3$-N + Organic Nitrogen

(c) TN: TKN + $NO_3$-N + $NO_2$-N

### Irrigation Water Classification

| Salinity Hazard Class | EC (µS/cm) | Irrigation Water Class | Sodium Hazard Class | SAR | Irrigation Water Class |
|---|---|---|---|---|---|
| **C1** | 100-250 | Low Salinity | **S1** | <10 | Low Sodium |
| **C2** | 250-750 | Medium Salinity | **S2** | 10-18 | Medium Sodium |
| **C3** | 750-2250 | High Salinity | **S3** | 18-26 | High Sodium |
| **C4** | >2250 | Very High Salinity | **S4** | >26 | Very High Sodium |

### Water Class Quality Criteria for Continental Surface Water that is to Receive Effluent[1]

| Water Quality Parameters | Water Quality Classes[2] | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| A) Physical and Inorganic-Chemical Parameters | | | | |
| 1) Temperature (°C) | 25 | 25 | 30 | > 30 |
| 2) pH | 6.5-8.5 | 6.5-8.5 | 6.0-9.0 | Outside of 6.0-9.0 |
| 3) Dissolved Oxygen (mg $O_2$/L) [a] | 8 | 6 | 3 | < 3 |
| 4) Oxygen Saturation (%) [a] | 90 | 70 | 40 | < 40 |
| 5) Chlorine Ion (mg $Cl^-$/L) | 25 | 200 | 400[b] | > 400 |
| 6) Sulfate Ion (mg $SO_4^=$/L) | 200 | 200 | 400 | > 400 |
| 7) Ammonium Nitrogen (mg $NH_4^+$-N/L) | 0.2[c] | 1[c] | 2[c] | > 2 |
| 8) Nitrite Nitrogen (mg $NO_2^-$-N/L) | 0.002 | 0.01 | 0.05 | > 0.05 |
| 9) Nitrate Nitrogen (mg $NO_3^-$-N/L) | 5 | 10 | 20 | > 20 |
| 10) Total Phosphorous (mg P/L) | 0.02 | 0.16 | 0.65 | > 0.65 |
| 11) Total Dissolved Solids (mg/L) | 500 | 1500 | 5000 | > 5000 |
| 12) Colour (Pt-Co Unit) | 5 | 50 | 300 | > 300 |
| 13) Sodium (mg $Na^+$/L) | 125 | 125 | 250 | > 250 |
| B) Organic Parameters | | | | |
| 1) Chemical Oxygen Demand (COD) (mg/L) | 25 | 50 | 70 | > 70 |
| 2) Biochemical Oxygen Demand (BOD) (mg/L) | 4 | 8 | 20 | > 20 |
| 3) Total Organic Carbon (mg/L) | 5 | 8 | 12 | > 12 |
| 4) Total Kjeldahl-nitrogen (mg/L) | 0.5 | 1.5 | 5 | > 5 |
| 5) Oil and Grease (mg/L) | 0.02 | 0.3 | 0.5 | > 0.5 |

| Water Quality Parameters | Water Quality Classes[2] | | | |
|---|---|---|---|---|
| | I | II | III | IV |
| 6) Methylene Blue Active Substances Assay (MBAS) surfactants (mg/L) | 0.05 | 0.2 | 1 | > 1.5 |
| 7) Phenolic Compounds (volatile) (mg/L) | 0.002 | 0.01 | 0.1 | > 0.1 |
| 8) Mineral oils and derivatives (mg/L) | 0.02 | 0.1 | 0.5 | > 0.5 |
| 9) Total Pesticides (mg/L) | 0.001 | 0.01 | 0.1 | > 0.1 |
| C) Inorganic Contaminant Parameters | | | | |
| 1) Mercury (µg Hg/L) | 0.1 | 0.5 | 2 | > 2 |
| 2) Cadmium (µg Cd/L) | 3 | 5 | 10 | > 10 |
| 3) Lead (µg Pb/L) | 10 | 20 | 50 | > 50 |
| 4) Arsenic (µg As/L) | 20 | 50 | 100 | > 100 |
| 5) Copper (µg Cu/L) | 20 | 50 | 200 | > 200 |
| 6) Chrome (total) (µg Cr/L) | 20 | 50 | 200 | > 200 |
| 7) Chrome (µg $Cr^{+6}$/L) | Undetectable | 20 | 50 | > 50 |
| 8) Cobalt (µg Co/L) | 10 | 20 | 200 | > 200 |
| 9) Nickel (µg Ni/L) | 20 | 50 | 200 | > 200 |
| 10) Zinc (µg Zn/L) | 200 | 500 | 2000 | > 2000 |
| 11) Cyanide (total) (µg CN/L) | 10 | 50 | 100 | > 100 |
| 12) Fluoride (µg $F^-$/L) | 1000 | 1500 | 2000 | > 2000 |
| 13) Free Chlorine (µg $Cl_2$/L) | 10 | 10 | 50 | > 50 |
| 14) Sulphur (µg $S^=$/L) | 2 | 2 | 10 | > 10 |
| 15) Iron (µg Fe/L) | 300 | 1000 | 5000 | > 5000 |
| 16) Manganese (µg Mn/L) | 100 | 500 | 3000 | > 3000 |
| 17) Boron (µg B/L) | 1000[e] | 1000[e] | 1000[e] | > 1000 |
| 18) Selenium (µg Se/L) | 10 | 10 | 20 | > 20 |
| 19) Barium (µg Ba/L) | 1000 | 2000 | 2000 | > 2000 |
| 20) Aluminum (mg Al/L) | 0.3 | 0.3 | 1 | > 1 |
| 21) Radioactivity (Bq/L) | | | | |
| Alpha-activity | 0.5 | 5 | 5 | > 5 |
| Beta- activity | 1 | 10 | 10 | > 10 |
| D) Bacteriologic Parameters | | | | |
| 1) Fecal Coliform (MPN/100 mL) | 10 | 200 | 2000 | > 2000 |
| 2) Total Coliform (MPN/100 mL) | 100 | 20000 | 100000 | > 100000 |

[1]Table 1, from the Appendices of the Regulation on Water Pollution Control, Directed to from Article 38
[2] As described in the footnotes of Surface Water Chemical and Physiochemical Parameters Criteria
[(a)] It is enough to satisfy either one of the concentration or saturation percentage parameters.
[(b)] When irrigating plants that are sensitive to chlorine, this concentration limit may need to be reduced.
[(c)] According to the pH value, the concentration of free ammonia nitrogen should not exceed 0.02 mg $NH_3$-N/L.
[(d)] In this group of criteria, the total concentrations of all of the chemical derivatives of the parameters are given.
[(e)] When irrigating plants that are sensitive to boron, it may be needed to lower this criteria to 300 µg/.

**Effluent Wastewater Standards for Domestic Wastewater**

| Parameters | Unit | Turkish Standard[1] (Population: 84 – 2000) | EU Guid.[2] | IFC Std.[3] | Project Standards |
|---|---|---|---|---|---|
| | | Composite sample – 2 hr | | | |
| pH index | mg/l | 6-9 | - | 6-9 | 6-9 |

| Parameters | Unit | Turkish Standard[1] (Population: 84 – 2000) Composite sample – 2 hr | EU Guid.[2] | IFC Std.[3] | Project Standards |
|---|---|---|---|---|---|
| Biochemical Oxygen Demand | mg/l | 50 | 25 | 30 | 25 |
| Chemical Oxygen Demand | mg/l | 180 | 125 | 125 | 120 |
| Total nitrogen | mg/l | - | 15 | 10 | 10 |
| Total phosphorus | mg/l | - | 2 | 2 | 2 |
| Total Suspended Solids | mg/l | 70 | 35 | 50 | 35 |
| Oil and grease | mg/l | - | - | 10 | 10 |
| Total coliform bacteria | MPN[5] /100 ml | - | - | 400[4] | 400 |

[1] Regulation on the Control of Water Pollution concerning domestic wastewater discharge limit value
[2] EU standards from Directive 91/271/EEC concerning urban wastewater treatment
[3] IFC General Environmental, Health, and Safety (EHS) Guidelines
[4] Not applicable to centralized, municipal, wastewater treatment systems which are included in EHS Guidelines for Water and Sanitation.
[5] MPN = Most Probable Number

**Drinking Water Quality Standards**

***For Surface Water Quality***

| Water Quality Parameters | Regulation / Standard / Purpose | Location in the Regulation / Purpose of Evaluation | Unit | RWIHC Reporting Limit | EU Reporting Limit | WHO Reporting Limit | Min. Reporting Limit |
|---|---|---|---|---|---|---|---|
| 1,2-dichloroethane | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 3 | 3 | 30 | 3 |
| Colony Count at 22 °C | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | - | - | - | - | - |
| Acrylamide | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | 0.5 | 0.1 |
| Aluminum (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | - | - | - | - |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | µg/L | 200 | 200 | - | 200 |
| Ammonium | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 0.5 | 0.5 | - | 0.5 |
| Ammonium Nitrogen | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg $NH_4^+$-N/L | 0.2 | | | 0.2 |
| Sulfide-reducing bacteria with anaerobic spores | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/50ml | | | | |
| Antimony | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 5 | 10 | 20 | 5 |
| Arsenic (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 10 | 10 |
| Copper (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 2 | 2 | 2 | 2 |
| Barium | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| Benzene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 1 | 1 | 10 | 1 |
| Benzo(a)pyrene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.01 | 0.01 | 0.7 | 0.01 |
| Beryllium | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| Bicarbonate (HCO3) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Biochemical Oxygen Demand | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg/L | 4 | | | 4 |
| Boron (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 1 | 1.5 | 2.4 | 1 |
| Bromate | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 10 | 10 |
| Turbidity | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | | |
| C. perfringens (including Spores) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | number/ 100 ml | 0 | 0 | - | |
| Zinc | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| Mercury (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 1 | 1 | 6 | 1 |
| Mercury and its compounds | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-5 | µg/L | | | | |
| Dissolved Oxygen | Physical Parameter | Onsite Measurement in the Field | mg/L | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg/L | 6 | | | 6 |
| Flow | Physical Parameter | Onsite Measurement in the Field | liter/sec | | | | |
| Iron (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | µg/L | 200 | 200 | - | 200 |
| E.coli | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/250 ml | | | - | |
| Electrical Conductivity | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | µS/cm | 400 | | | 400 |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | at 20 °C µS/cm | 2500 | 2500 | - | 2500 |
| | Physical Parameter | Onsite Measurement in the Field | µS/cm | | | | |
| Enterococcus | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/250 ml | | | - | |
| Epicloridine | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | 0.4 | 0.1 |
| Fluoride | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | µg/L | 1000 | | | 1000 |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 1.5 | 1.5 | 1.5 | 1.5 |
| Silver | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| In the sample taken after being packaged in the water fill station;<br>Colony count at 22 °C<br>Colony count at 37 °C<br><br>Maximum in the sample taken from packaged water sold in the market:<br>Colony count at 22 °C<br>Colony count at 37 °C | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 100/ml<br>20/ml<br><br>It is ten times the limit value determined for water fill station. | | | | |
| Cadmium | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 5 | 5 | 3 | 3 |
| Cadmium and its compounds | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-5 | µg/L | | | | |
| Calcium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Carbonate (CO3) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Maximum in the sample from the source:<br>Colony count at 22 °C | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 20/ml<br>5/ml | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Colony count at 37 °C | | | | | | | |
| Chemical Oxygen Demand | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg/L | 25 | | | 25 |
| Chloride | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 250 | 250 | - | 250 |
| Cobalt | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| Odor | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | | |
| Coliform bacteria | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | - | 0 |
| Chromium (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | 50 | | | 50 |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 50 | 50 | 50 | 50 |
| Lead (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 10 | 10 |
| Lead and its compounds | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | EK-5 / Tablo-5'te Yer Alan Metal Parametreleri | µg/L | | | | |
| Magnesium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Manganese (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | µg/L | 100 | | | 100 |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | µg/L | 50 | 50 | 80 | 50 |
| Nickel (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 20 | 20 | 70 | 20 |
| Nickel and its compounds | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-5 | µg/L | | | | |
| Nitrate | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 50 | 50 | 50 | 50 |
| Nitrate Nitrogen | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg $NO_3^-$-N/L | 3 | | | 3 |
| Nitrite | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 0.5 | 0.5 | 3 | 0.5 |
| Oxidation Reduction (Redox) Potential (ORP) | Physical Parameter | Onsite Measurement in the Field | mV | | | | |
| Oxidizability | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L O2 | 5 | 5 | - | 5 |
| Ortho Phosphate Phosphorus | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg o-$PO_4$-P/L | 0.05 | - | - | 0.05 |
| P. aeruginosa | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/250 ml | | | | |
| Parasites | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/5 L | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pathogen Staphylococci | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/100ml | | | | |
| Pesticides | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | - | 0.1 |
| pH | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | - | | | | |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | - | 6.5 - 9.5 | 6.5 - 9.5 | - | |
| | Physical Parameter | Onsite Measurement in the Field | | | | | |
| Polycyclic Aromatic Hydrocarbons | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | - | 0.1 |
| Potassium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Color | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | m-1 | | | | |
| Color (436 nm) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | $m^{-1}$ | 1.5 | | | 1.5 |
| Color (525nm) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | $m^{-1}$ | 1.2 | | | 1.2 |
| Color (620 nm) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | $m^{-1}$ | 0.8 | | | 0.8 |
| Selenium (Total) | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | µg/L | 10 | | | 10 |
| | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 20 | 40 | 10 |
| Temparature | Physical Parameter | Onsite Measurement in the Field | C° | | | | |
| Cyanide | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 50 | 50 | - | 50 |
| Sodium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Sodium (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 200 | 200 | - | 200 |
| Sulfate (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Sulphate (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 250 | 250 | - | 250 |
| Sulphur | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | µg/L | 2 | | | 2 |
| Taste | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | - | |
| Tetrachlorothene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 100.8 | 10 |
| Total Nitrogen | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg N/L | 3.5 | | | 3.5 |
| Total Dissolved Matter | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Total Phosphorus | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg P/L | 0.08 | | | 0.08 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Indicator Dose | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | d) radioactivity | mSv/year | 0.1 | | - | 0.1 |
| Total Kjeldahl Nitrogen | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg N/L | 0.5 | | | 0.5 |
| Total Organic Carbon (TOC) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | | |
| Total Pesticides | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.5 | 0.5 | - | 0.5 |
| Total Cyanide | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 50 | 50 | - | 50 |
| Trihalomethanes-total | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 100 | 100 | - | 100 |
| Trichloroethene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 100.8 | 10 |
| Tritium | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | d) Radioactivity | Bq/L | 100 | | - | 100 |
| Vanadium | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Metal Parameters in Annex-5 / Table-4 | µg/L | | | | |
| Vinyl Chloride | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.5 | 0.5 | 0.3 | 0.3 |
| Oil & Grease | Regulation on Surface Water Quality / EU DIRECTIVE 2008/105/EC | Annex-5 / Table-2 | mg/L | 0.2 | | | 0.2 |

***For Groundwater Quality***

| Water Quality Parameters | Regulation / Standard / Purpose | Location in the Regulation / Purpose of Evaluation | Unit | RWIHC Reporting Limit | EU Reporting Limit | WHO Reporting Limit | Min. Reporting Limit |
|---|---|---|---|---|---|---|---|
| 1.2-dichloroethane | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 3 | 3 | 30 | **3** |
| Colony Count at 22 °C | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | - | |
| Acrylamide | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | 0.5 | **0.1** |
| Aluminum (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | µg/L | 200 | 200 | - | **200** |
| Ammonium | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 0.5 | 0.5 | - | **0.5** |
| sulfide-reducing bacteria with anaerobic spores | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/50ml | | | | |
| Antimony | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 5 | 10 | 20 | **5** |
| Arsenic (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 10 | **10** |
| Copper (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 2 | 2 | 2 | **2** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Benzene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 1 | 1 | 10 | **1** |
| Benzo(a)pyrene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.01 | 0.01 | 0.7 | **0.01** |
| Bicarbonate (HCO3) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Boron (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 1 | 1.5 | 2.4 | **1** |
| Bromate | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 10 | **10** |
| Turbidity | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | | |
| C. perfringens (including Spores) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | number/ 100 ml | 0 | 0 | - | |
| Zinc | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 1 | 1 | 6 | **1** |
| Dissolved Oxygen | Physical Parameter | Onsite Measurement in the Field | mg/L | | | | |
| Flow | Physical Parameter | Onsite Measurement in the Field | liter/sec | | | | |
| Iron (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | µg/L | 200 | 200 | - | **200** |
| E.coli | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/250 ml | | | - | |
| Electrical Conductivity | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | at 20 °C µS/cm | 2500 | 2500 | - | **2500** |
| Electrical Conductivity | Physical Parameter | Onsite Measurement in the Field | µS/cm | | | | |
| enterococcus | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/250 ml | | | - | |
| epicloridine | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | 0.4 | **0.1** |
| Fluoride | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 1.5 | 1.5 | 1.5 | **1.5** |
| In the sample taken after being packaged in the water fill station; Colony count at 22 °C<br>Colony count at 37 °C<br><br>Maximum in the sample taken from packaged water sold in the market: Colony count at 22 °C | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 100/ml<br>20/ml<br><br>It is ten times the limit value determined for water fill station. | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Colony count at 37 °C | | | | | | | |
| Cadmium | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 5 | 5 | 3 | **3** |
| Calcium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Carbonate (CO3) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Maximum in the sample from the source:<br>Colony count at 22 °C<br>Colony count at 37 °C | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 20/ml<br>5/ml | | | | |
| chloride | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 250 | 250 | - | **250** |
| Odor | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | | |
| Coliform bacteria | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | - | **0** |
| Chromium (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 50 | 50 | 50 | **50** |
| Lead (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 10 | **10** |
| Magnesium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Manganese (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | µg/L | 50 | 50 | 80 | **50** |
| Nickel (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 20 | 20 | 70 | **20** |
| Nitrate | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 50 | 50 | 50 | **50** |
| Nitrite | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | mg/L | 0.5 | 0.5 | 3 | **0.5** |
| Oxidation Reduction (Redox) Potential (ORP) | Physical Parameter | Onsite Measurement in the Field | mV | | | | |
| oxidizability | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L O2 | 5 | 5 | | **5** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| P. Aeruginosa | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/250 ml | | | | |
| parasites | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/5 L | | | | |
| Pathogen Staphylococci | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | a) Microbiological Parameters | 0/100ml | | | | |
| pesticides | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | - | **0.1** |
| pH | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | - | 6.5 - 9.5 | 6.5 - 9.5 | - | |
| pH | Physical Parameter | Onsite Measurement in the Field | | | | | |
| Polycyclic Aromatic Hydrocarbons | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.1 | 0.1 | - | **0.1** |
| Potassium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Color | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | m-1 | | | | |
| Selenium (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 20 | 40 | **10** |
| Temparature | Physical Parameter | Onsite Measurement in the Field | C° | | | | |
| Cyanide | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 50 | 50 | - | **50** |
| Sodium (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Sodium (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 200 | 200 | - | **200** |
| Sulfate (Dissolved) | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Sulphate (Total) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | mg/L | 250 | 250 | - | **250** |
| Taste | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | - | |
| Tetrachlorothene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 100.8 | **10** |
| Total Dissolved Matter | Chemical Parameter | Hydrogeochemical (Water Type) Evaluations | mg/L | | | | |
| Total Indicator Dose | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | d) Radioactivity | mSv/yıl | 0.1 | | - | **0.1** |
| Total Organic Carbon (TOC) | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | c) Indicator Parameters | | | | | |
| Total Pesticides | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 0.5 | 0.5 | - | **0.5** |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Total Cyanide | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 50 | 50 | - | **50** |
| Trihalomethanes-total | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 100 | 100 | - | **100** |
| Trichloroethene | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | b) Chemical Parameters | µg/L | 10 | 10 | 100.8 | **10** |
| tritium | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | d) Radioactivity | Bq/L | 100 | | - | **100** |
| Vinyl Chloride | Regulation on Water Intended for Human Consumption / EU DIRECTIVE 98/83/EC / EU DIRECTIVE 2020/2184 | d) Radioactivity | µg/L | 0.5 | 0.5 | 0.3 | **0.3** |
| Ammonium | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Arsenic (Total) | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Mercury (Total) | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Electrical Conductivity | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | µS/cm | | | | |
| Cadmium (Total) | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| chloride | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Lead (Total) | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Nitrite | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Sulphate (Total) | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Tetrachloroethylene | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Total Phosphorus/Phosphates | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |
| Trichloroethylene | Regulation on Protection of Groundwater against Pollution and Deterioration / EU DIRECTIVE 2006/118/EC | EK3 / Minimum Parameter List | mg/L | | | | |

## Soil Quality

Project baseline data used as Project Standard

### Soil Standards[1]

| Measured Parameters | Units | National Standards | |
|---|---|---|---|
| | | Soil ingestion and absorption through skin contact | Inhalation of fugitive dust in the external environment |
| **Extractable Metals / Major Cations** | | | |

| | | | |
|---|---|---|---|
| Antimony | mg/kg | 31 | - |
| Arsenic | mg/kg | 0.4 | 471 |
| Barium | mg/kg | 15643 | 433702 |
| Beryllium | mg/kg | 0.1 | 843 |
| Cadmium | mg/kg | 70 | 1124 |
| Chromium +3 | mg/kg | 117321 | - |
| Chromium +6 | mg/kg | 235 | 24 |
| Total Chromium | mg/kg | 235 | 24 |
| Cobalt | mg/kg | 23 | 225 |
| Copper | mg/kg | 3129 | - |
| Lead | mg/kg | 400 | - |
| Mercury | mg/kg | 23 | - |
| Molybdenum | mg/kg | 391 | - |
| Nickel | mg/kg | 1564 | - |
| Selenium | mg/kg | 391 | - |
| Silver | mg/kg | 391 | - |
| Thallium | mg/kg | 5 | - |
| Tin | mg/kg | 46929 | - |
| Titanium | mg/kg | 312857 | - |
| Vanadium | mg/kg | 548 | - |
| Zinc | mg/kg | 23464 | - |
| **BTEX** | | | |
| Benzene | mg/kg | 12 | - |
| Toluene | mg/kg | 6257 | - |

| | | | |
|---|---|---|---|
| Ethylbenzene | mg/kg | 7821 | - |
| Meta-&para-Xylene | mg/kg | 156429 | - |
| Ortho-Xylene | mg/kg | 156429 | - |
| Sum of xylenes | mg/kg | 15643 | - |
| **Halogenated Volatile Organic Compounds** | | | |
| Vinyl Chloride | mg/kg DW | 0.4 | - |
| Chloromethane | mg/kg DW | 49 | - |
| Methyl Bromide | mg/kg DW | 110 | - |
| Chloroform | mg/kg DW | 105 | - |
| 1.2 - dichloroethane | mg/kg DW | 7 | - |
| Cis 1.3-dichloropropane | mg/kg DW | 6 | - |
| Bromo dichloromethane | mg/kg DW | 10 | - |
| 1.3- Di chloropropane | mg/kg DW | 6 | - |
| 1.1.2-Trichloroethane | mg/kg DW | 11 | - |
| Dibromochloromethane | mg/kg DW | 6 | - |
| 1.1.1.2-Tetrachloroethane | mg/kg DW | 3 | - |
| Chlorobenzene | mg/kg DW | 1564 | - |
| Bromoform | mg/kg DW | 61 | - |
| 1.1.2.2-Tetrachloroethane | mg/kg DW | 3 | - |
| 1.2-Dichlorobenzene | mg/kg DW | 7039 | - |
| 1.4-dichlorobenzene | mg/kg DW | 118 | - |
| 1.2-Dichloropropane | mg/kg DW | 18 | - |
| **Nonhalogenated Volatile Organic Compounds** | | | |
| Styrene | mg/kg DW | 15643 | - |

| | | | |
|---|---|---|---|
| Methyl Tertiary-Butyl Ether | mg/kg DW | 355 | - |
| **Polycyclic Aromatic Hydrocarbons (PAHs)** | | | |
| Naphthalene | mg/kg DW | 1147 | - |
| **Aliphatic Fractions of Petroleum Hydrocarbons** | | | |
| Total Petroleum Hydrocarbons (Aliphatic) (EC5 - EC8) | mg/kg | 4693 | - |
| Total Petroleum Hydrocarbons (Aliphatic) (EC8> - EC16) | mg/kg | 7821 | - |
| Total Petroleum Hydrocarbons (Aliphatic) (EC16> - EC35) | mg/kg | 156429 | - |
| **Aromatic Fractions of Petroleum Hydrocarbons** | | | |
| Total Petroleum Hydrocarbons (Aromatic) (EC5 - EC9) | mg/kg | 15643 | - |
| Total Petroleum Hydrocarbons (Aromatic) (EC9> - EC16) | mg/kg | 1564 | - |
| Total Petroleum Hydrocarbons (Aromatic) (EC16> - EC35) | mg/kg | 2346 | - |

[1] Regulation on Control of Soil Pollution and Contaminated Lands by Point Sources

## Noise and Vibration

**Noise Standards (dBA)[1, 2]**

| Pollutant / Source | Receptor | IFC | | Regulation on Control of Environmental Noise | | | Project Standards |
|---|---|---|---|---|---|---|---|
| | | Day (07:00-22:00) | Night (22:00-07:00) | Day (07:00-19:00) | Evening (19:00-23:00) | Night (23:00-07:00) | |
| Resources | Industrial facilities, transportation sources | - | - | 65 | 60 | 55 | For Project areas (since classified as industrial facilities, transportation sources):<br>65 (day)<br>60 (evening)<br>55 (night)<br><br>For settlement areas during all phases of Project:<br>55 (day)<br>45 (night) |
| | Businesses | | | Background Noise Levels + 5 | | Background Noise Levels + 3 | |
| | In case of multiple businesses | | | Background Noise Levels + 7 | | Background Noise Levels + 5 | |
| | All sources | | | 100 | | | |
| | Residential; institutional; educational | 55 | 45 | - | - | - | |
| | Industrial; commercial | 70 | 70 | - | - | - | |

[1] Regulation on Control of Environmental Noise
[2] According to the IFC General EHS Guideline Noise measurement levels sourced from Project activities should not exceed the levels presented above or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.

## Vibration Standards[1]

**The maximum allowable values of ground vibrations to be created by vibrations that will occur due to blasting in mines, quarries and similar areas[1]**

| Structure Type | | Highest Vibration Rate at Foundation of Buildings, (mm/s) (based on frequency, f=Hz) | | | On the floor (base) of the top floor for all frequencies |
|---|---|---|---|---|---|
| | | f= 1-10 | f=10-50 | f=50-100 | |
| 1 | Industrial buildings | 20 | 40 | 50 | 40 |
| 2 | Durable structures such as houses, brick and concrete | 5 | 15 | 20 | 15 |
| 3 | Buildings, historical and natural structures that are vibration sensitive and excluded from the 1st and 2nd clauses | 2 | 8 | 10 | 8 |

[1] Regulation on Control of Environmental Noise

**The highest allowable values of ground vibrations to be generated by railway and road transportation vehicles, workplaces and industrial facilities in the nearest structure and ground vibrations to be generated by machinery and equipment inside the building[1]**

| Structures | Vibration Frequency (Hz) | Maximum Permissible Vibration Rate (rms value (mm/s)) |
|---|---|---|
| In Residences | 1 | 1.5 |
| | 8-100 | 0.3 |
| In Offices | 1 | 3.5 |
| | 8-100 | 0.6 |
| In Historical and Natural Structures | 1 | 0.8 |
| | 8-100 | 0.1 |

[1] Regulation on Control of Environmental Noise

**The highest allowable values of ground vibrations that will be generated by piling and similar vibration-generating operations in constructions, and outside the nearest structure by construction machinery (in frequency bands between 1 Hz and 80 Hz)[1]**

| Locations | Maximum Permissible Vibration Rate (Peak Value-mm/s) | |
|---|---|---|
| | Continuous Vibration | Discontinuous Vibration |
| Residential Areas | 5 | 10 |
| Commercial Areas | 15 | 30 |

| | | |
|---|---|---|
| Historical and Natural Structures | 2 | 5 |

[1] Regulation on Control of Environmental Noise

**ICNIRP Exposure Limits for General Public Exposure to Electric and Magnetic Fields[1]**

| Frequency | Electric field (V/m) | Magnetic Field (μT) |
|---|---|---|
| 50 Hz | 5000 | 100 |
| 60 Hz | 4150 | 83 |

[1] IFC Environmental, Health and Safety Guidelines for Electric Power Transmission and Distribution



wsp.com

**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix B - Project Sample Sections/Images*

Submitted to:

**ÇOK A.Ş.**
1915 Çanakkale Ana Kontrol Merkezi Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, Çanakkale

Submitted by:

**WSP Danışmanlık ve Mühendislik Ltd. Şti.**
Hollanda Cad. 691. Sok. Vadi Sitesi No:4, Yıldız 06550 Ankara, Turkey

+90 312 4410031

22519766-final draft

March 2025



**APPENDIX B**

# Project Sample Sections/Images



wsp.com

**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix C - Laboratory Results*

Submitted to:

**ÇOK A.Ş.**

1915 Çanakkale Ana Kontrol Merkezi Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6
17800 Lapseki, Çanakkale

Submitted by:

**WSP Danışmanlık ve Mühendislik Ltd. Şti.**

Hollanda Cad. 691. Sok. Vadi Sitesi No:4, Yıldız 06550 Ankara, Turkey

+90 312 4410031

22519766-final draft

March 2025



**APPENDIX C**

# Laboratory Results

(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

2187

# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

**REPORT NUMBER** X936R

**BOOKING IN REFERENCE No** X936

**DESPATCH NOTE No** SOR01492

**CUSTOMER** Ahmet CETIN
Turkey

**DATE SAMPLES RECEIVED** 23-Nov

**GRADKO LAB REF** GIN01365-01368

**JOB REFERENCE**

| Tube Identification | | Date On | Date Off | Exposure (hrs) | NITROGEN DIOXIDE µg $NO_2$ Total | µg$NO_2$ - Blank | $NO_2$ µg/$m^3$* | $NO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001941 | 1.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.91 | 1.91 | 10.57 | 5.50 |
| 001942 | 2.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.16 | 2.15 | 11.89 | 6.19 |
| 001943 | 3.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.12 | 2.11 | 11.65 | 6.06 |
| 001944 | 4.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.10 | 2.11 | 13.13 | 6.83 |
| 001945 | 5.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.18 | 2.17 | 13.61 | 7.08 |
| 001946 | 6.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.02 | 2.02 | 13.87 | 7.21 |
| 001947 | 7.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.93 | 1.92 | 13.16 | 6.84 |
| 001948 | 8.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.92 | 1.91 | 12.80 | 6.66 |
| 001949 | 9.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.99 | 1.98 | 12.15 | 6.32 |
| 001950 | 10.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.97 | 1.96 | 12.86 | 6.69 |
| 001951 | 11.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.89 | 1.90 | 13.35 | 6.94 |
| 001952 | 12.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.98 | 1.99 | 13.12 | 6.82 |
| 001953 | 13.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.10 | 2.11 | 13.41 | 6.97 |
| 001954 | 14.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.04 | 2.05 | 14.52 | 7.55 |
| 001955 | 15.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.92 | 1.93 | 14.67 | 7.63 |
| 001956 | 16.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.90 | 1.91 | 14.80 | 7.70 |

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced. except in full. without the written permission of Gradko International Ltd.



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Gradko International Ltd
This signature confirms the authenticity of these results
Signed.....
L. Gates, Laboratory Manager

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St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

| Tube Identification | | Date On | Date Off | Exposure (hrs) | NITROGEN DIOXIDE µg $NO_2$ Total | µg$NO_2$ - Blank | $NO_2$ µg/m$^3$* | $NO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001957 | 17.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.99 | 1.98 | 14.89 | 7.74 |
| 001958 | 18.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.97 | 1.96 | 13.90 | 7.23 |
| 001959 | 19.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.89 | 1.90 | 14.01 | 7.29 |
| 001960 | 20.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.16 | 2.15 | 13.67 | 7.11 |
| 001961 | 21.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.12 | 2.11 | 10.76 | 5.60 |
| 001962 | 22.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.90 | 1.90 | 11.50 | 5.98 |
| 001963 | 23.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.01 | 2.01 | 11.35 | 5.90 |
| 001964 | 24.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.00 | 2.01 | 12.53 | 6.52 |
| 001965 | 25.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.01 | 12.20 | 6.34 |
| 001966 | 26.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.90 | 1.90 | 11.61 | 6.04 |
| 001967 | 27.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.92 | 1.92 | 11.57 | 6.01 |
| 001968 | 28.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.06 | 2.06 | 12.41 | 6.45 |
| 001969 | 29.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.06 | 2.05 | 13.11 | 6.82 |
| 001970 | 30.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.01 | 2.01 | 12.86 | 6.69 |
| 001971 | 31.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 12.63 | 6.57 |
| 001972 | 32.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.03 | 11.86 | 6.17 |
| 001973 | 33.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 12.52 | 6.51 |
| 001974 | 34.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.03 | 12.22 | 6.36 |
| 001975 | 35.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 12.84 | 6.68 |
| 001976 | 36.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.03 | 13.59 | 7.07 |
| 001977 | 37.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 14.15 | 7.36 |
| 001978 | 38.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.03 | 14.46 | 7.52 |
| 001979 | 39.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 14.85 | 7.72 |
| 001980 | 40.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.03 | 15.14 | 7.87 |
| 001981 | 41.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 14.81 | 7.70 |
| 001982 | 42.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.03 | 13.32 | 6.93 |
| 001983 | 43.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 13.95 | 7.25 |
| 001984 | 44.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.03 | 12.41 | 6.45 |
| 001985 | 45.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 11.20 | 5.82 |

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2187

# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

NITROGEN DIOXIDE

| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg $NO_2$ Total | µg$NO_2$ - Blank | $NO_2$ µg/$m^3$* | $NO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001986 | 46.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.99 | 1.99 | 9.87 | 5.13 |
| 001987 | 47.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.98 | 1.99 | 10.96 | 5.70 |
| 001988 | 48.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.00 | 1.99 | 10.08 | 5.24 |
| 001989 | 49.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.88 | 1.88 | 10.19 | 5.30 |
| 001990 | 50.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.90 | 1.90 | 11.00 | 5.72 |
| 001991 | 51.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.04 | 2.04 | 10.21 | 5.31 |
| 001992 | 52.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.04 | 2.03 | 11.35 | 5.90 |
| 001993 | 53.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.99 | 1.99 | 11.57 | 6.02 |
| 001994 | 54.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.91 | 1.92 | 10.76 | 5.59 |
| 001995 | 55.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.00 | 2.01 | 11.87 | 6.18 |
| 001996 | 56.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.99 | 1.99 | 11.32 | 5.88 |
| 001997 | 57.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.01 | 2.00 | 10.96 | 5.70 |
| 001998 | 58.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.89 | 1.89 | 9.98 | 5.19 |
| 001999 | 59.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.91 | 1.91 | 9.06 | 4.71 |
| 002000 | 60.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.05 | 2.05 | 9.73 | 5.06 |
| 002001 | 61.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.05 | 2.04 | 10.71 | 5.57 |
| 002002 | 62.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 9.40 | 4.89 |
| 002003 | 63.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 10.00 | 5.20 |
| 002004 | 64.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 11.30 | 5.88 |
| 002005 | 65.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 11.36 | 5.91 |
| 002006 | 66.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 12.28 | 6.38 |

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L. Gates, Laboratory Manager

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

### SULPHUR DIOXIDE

| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg S Total | µgS - Blank | $SO_2$ $\mu g/m^3$ * | $SO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001941 | 1.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.91 | 1.91 | 12.33 | 4.62 |
| 001942 | 2.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.16 | 2.15 | 12.02 | 4.51 |
| 001943 | 3.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.12 | 2.11 | 12.09 | 4.53 |
| 001944 | 4.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.10 | 2.11 | 11.84 | 4.44 |
| 001945 | 5.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.18 | 2.17 | 13.35 | 5.01 |
| 001946 | 6.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.02 | 2.02 | 13.83 | 5.19 |
| 001947 | 7.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.93 | 1.92 | 14.10 | 5.29 |
| 001948 | 8.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.92 | 1.91 | 13.38 | 5.02 |
| 001949 | 9.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.99 | 1.98 | 13.01 | 4.88 |
| 001950 | 10.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.97 | 1.96 | 12.35 | 4.63 |
| 001951 | 11.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.89 | 1.90 | 13.07 | 4.90 |
| 001952 | 12.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.98 | 1.99 | 13.57 | 5.09 |
| 001953 | 13.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.10 | 2.11 | 13.33 | 5.00 |
| 001954 | 14.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 2.04 | 2.05 | 13.63 | 5.11 |
| 001955 | 15.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.92 | 1.93 | 14.75 | 5.53 |
| 001956 | 16.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.90 | 1.91 | 14.92 | 5.59 |
| 001957 | 17.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.92 | 1.93 | 15.05 | 5.64 |
| 001958 | 18.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.90 | 1.91 | 15.13 | 5.68 |
| 001959 | 19.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.92 | 1.93 | 14.12 | 5.30 |
| 001960 | 20.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.90 | 1.91 | 14.24 | 5.34 |
| 001961 | 21.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.92 | 1.93 | 13.89 | 5.21 |
| 001962 | 22.Lokasyon/Turkey | 18.10.22 | 17.11.22 | 720.00 | 1.90 | 1.91 | 13.13 | 4.92 |
| 001963 | 23.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.92 | 1.93 | 14.02 | 5.26 |
| 001964 | 24.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.90 | 1.91 | 13.61 | 5.10 |
| 001965 | 25.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.92 | 1.93 | 15.03 | 5.64 |
| 001966 | 26.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.90 | 1.91 | 14.64 | 5.49 |
| 001967 | 27.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.92 | 1.93 | 13.93 | 5.23 |
| 001968 | 28.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.90 | 1.91 | 13.88 | 5.20 |
| 001969 | 29.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.92 | 1.93 | 14.89 | 5.58 |

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg S Total | µgS - Blank | SULPHUR DIOXIDE $SO_2$ µg/m$^3$ * | $SO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001970 | 30.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.99 | 1.98 | 14.65 | 5.49 |
| 001971 | 31.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.97 | 1.96 | 14.37 | 5.39 |
| 001972 | 32.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.89 | 1.90 | 14.11 | 5.29 |
| 001973 | 33.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.16 | 2.15 | 13.25 | 4.97 |
| 001974 | 34.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.12 | 2.11 | 13.09 | 4.91 |
| 001975 | 35.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.90 | 1.90 | 12.78 | 4.79 |
| 001976 | 36.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.01 | 2.01 | 13.42 | 5.03 |
| 001977 | 37.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.00 | 2.01 | 13.26 | 4.97 |
| 001978 | 38.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.02 | 2.01 | 13.80 | 5.18 |
| 001979 | 39.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.90 | 1.90 | 14.11 | 5.29 |
| 001980 | 40.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.92 | 1.92 | 14.49 | 5.43 |
| 001981 | 41.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.06 | 2.06 | 14.77 | 5.54 |
| 001982 | 42.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.06 | 2.05 | 14.45 | 5.42 |
| 001983 | 43.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 2.01 | 2.01 | 13.00 | 4.87 |
| 001984 | 44.Lokasyon/Turkey | 19.10.22 | 18.11.22 | 720.00 | 1.93 | 1.94 | 13.67 | 5.13 |
| 001985 | 45.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 12.78 | 4.79 |
| 001986 | 46.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 12.46 | 4.67 |
| 001987 | 47.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 13.65 | 5.12 |
| 001988 | 48.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 14.43 | 5.41 |
| 001989 | 49.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 13.62 | 5.11 |
| 001990 | 50.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 13.98 | 5.24 |
| 001991 | 51.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 14.34 | 5.38 |
| 001992 | 52.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 13.18 | 4.94 |
| 001993 | 53.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 14.22 | 5.33 |
| 001994 | 54.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 15.09 | 5.66 |
| 001995 | 55.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 12.91 | 4.84 |
| 001996 | 56.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 13.96 | 5.23 |

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

**SULPHUR DIOXIDE**

| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg S Total | µgS - Blank | $SO_2$ $\mu g/m^3$ * | $SO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001997 | 57.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 11.96 | 4.48 |
| 001998 | 58.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 13.96 | 5.23 |
| 001999 | 59.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.91 | 1.91 | 14.23 | 5.34 |
| 002000 | 60.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.05 | 2.05 | 12.20 | 4.58 |
| 002001 | 61.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.05 | 2.04 | 13.04 | 4.89 |
| 002002 | 62.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 12.96 | 4.86 |
| 002003 | 63.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 13.36 | 5.01 |
| 002004 | 64.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 1.93 | 1.94 | 14.83 | 5.56 |
| 002005 | 65.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 14.45 | 5.42 |
| 002006 | 66.Lokasyon/Turkey | 20.10.22 | 19.11.22 | 720.00 | 2.02 | 2.03 | 13.93 | 5.22 |

(RESULTS ARE BLANK CORRECTED)

**OVERALL M.U.** ±14.8%

**REPORTING LIMIT** 0.03µg S

Analysed on Dionex ICS1100 ICU10

**ANALYST NAME** J Reynold

**DATE OF ANALYSIS** 29/11/2022

**DATE OF REPORT** 30/11/2022

ANALYSIS HAS BEEN CARRIED OUT IN ACCORDANCE WITH IN-HOUSE METHOD GLM3

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced. except in full. without the written permission of Gradko International Ltd.



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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

**REPORT NUMBER** X935R

**BOOKING IN REFERENCE No** X935

**DESPATCH NOTE No** SOR01456

**CUSTOMER** Ahmet CETIN
Turkey

**DATE SAMPLES RECEIVED** 25-Oct

**GRADKO LAB REF** GIN01332-01335

**JOB REFERENCE**

| | | | | | NITROGEN DIOXIDE | | | |
|---|---|---|---|---|---|---|---|---|
| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg $NO_2$ Total | µg$NO_2$ - Blank | $NO_2$ µg/$m^3$* | $NO_2$ ppb* |
| 001941 | 1.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.95 | 1.96 | 8.81 | 4.58 |
| 001942 | 2.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.93 | 1.94 | 8.26 | 4.30 |
| 001943 | 3.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.02 | 2.03 | 8.09 | 4.21 |
| 001944 | 4.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.10 | 2.11 | 9.12 | 4.74 |
| 001945 | 5.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.18 | 2.17 | 9.45 | 4.91 |
| 001946 | 6.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.02 | 2.02 | 9.63 | 5.01 |
| 001947 | 7.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.93 | 1.92 | 9.14 | 4.75 |
| 001948 | 8.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.92 | 1.91 | 8.89 | 4.62 |
| 001949 | 9.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.99 | 1.98 | 8.44 | 4.39 |
| 001950 | 10.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.97 | 1.96 | 8.93 | 4.64 |
| 001951 | 11.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.89 | 1.90 | 9.27 | 4.82 |
| 001952 | 12.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.98 | 1.99 | 9.11 | 4.74 |
| 001953 | 13.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.10 | 2.11 | 9.31 | 4.84 |
| 001954 | 14.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.04 | 2.05 | 10.08 | 5.24 |
| 001955 | 15.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.92 | 1.93 | 10.19 | 5.30 |
| 001956 | 16.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.90 | 1.91 | 10.28 | 5.35 |

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

| Tube Identification | | Date On | Date Off | Exposure (hrs) | NITROGEN DIOXIDE µg $NO_2$ Total | µg$NO_2$ - Blank | $NO_2$ µg/$m^3$* | $NO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001957 | 17.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.98 | 1.99 | 10.34 | 5.38 |
| 001958 | 18.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.97 | 1.96 | 9.65 | 5.02 |
| 001959 | 19.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.89 | 1.90 | 9.73 | 5.06 |
| 001960 | 20.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.16 | 2.15 | 9.49 | 4.94 |
| 001961 | 21.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.12 | 2.11 | 8.97 | 4.67 |
| 001962 | 22.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.90 | 1.90 | 9.58 | 4.98 |
| 001963 | 23.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.01 | 2.01 | 9.30 | 4.84 |
| 001964 | 24.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.00 | 2.01 | 10.27 | 5.34 |
| 001965 | 25.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.01 | 10.00 | 5.20 |
| 001966 | 26.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.90 | 1.90 | 9.52 | 4.95 |
| 001967 | 27.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.92 | 1.92 | 9.48 | 4.93 |
| 001968 | 28.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.06 | 2.06 | 10.17 | 5.29 |
| 001969 | 29.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.06 | 2.05 | 10.01 | 5.21 |
| 001970 | 30.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.01 | 2.01 | 9.82 | 5.11 |
| 001971 | 31.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 9.64 | 5.01 |
| 001972 | 32.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.03 | 9.05 | 4.71 |
| 001973 | 33.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 8.94 | 4.65 |
| 001974 | 34.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.03 | 8.73 | 4.54 |
| 001975 | 35.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 9.17 | 4.77 |
| 001976 | 36.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.03 | 9.06 | 4.71 |
| 001977 | 37.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 9.43 | 4.90 |
| 001978 | 38.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.03 | 9.64 | 5.01 |
| 001979 | 39.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 9.90 | 5.15 |
| 001980 | 40.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.03 | 10.09 | 5.25 |
| 001981 | 41.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 9.87 | 5.13 |
| 001982 | 42.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.03 | 8.88 | 4.62 |
| 001983 | 43.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 9.34 | 4.86 |
| 001984 | 44.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.03 | 8.73 | 4.54 |
| 001985 | 45.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 8.51 | 4.43 |

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

| Tube Identification | | Date On | Date Off | Exposure (hrs) | NITROGEN DIOXIDE µg $NO_2$ Total | µg$NO_2$ - Blank | $NO_2$ µg/$m^3$* | $NO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001986 | 46.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.00 | 2.01 | 7.77 | 4.04 |
| 001987 | 47.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.90 | 1.91 | 8.63 | 4.49 |
| 001988 | 48.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.92 | 1.93 | 7.94 | 4.13 |
| 001989 | 49.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.88 | 1.88 | 8.02 | 4.17 |
| 001990 | 50.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.90 | 1.90 | 8.66 | 4.50 |
| 001991 | 51.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.04 | 2.04 | 7.25 | 3.77 |
| 001992 | 52.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.04 | 2.03 | 8.94 | 4.65 |
| 001993 | 53.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.99 | 1.99 | 9.11 | 4.74 |
| 001994 | 54.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.91 | 1.92 | 8.47 | 4.40 |
| 001995 | 55.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.00 | 2.01 | 9.35 | 4.86 |
| 001996 | 56.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.99 | 1.99 | 8.91 | 4.63 |
| 001997 | 57.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.01 | 2.00 | 9.46 | 4.92 |
| 001998 | 58.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.89 | 1.89 | 8.53 | 4.44 |
| 001999 | 59.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.91 | 1.91 | 7.74 | 4.03 |
| 002000 | 60.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.05 | 2.05 | 6.16 | 3.20 |
| 002001 | 61.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.05 | 2.04 | 6.78 | 3.53 |
| 002002 | 62.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 5.95 | 3.09 |
| 002003 | 63.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 6.33 | 3.29 |
| 002004 | 64.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 7.15 | 3.72 |
| 002005 | 65.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 7.19 | 3.74 |
| 002006 | 66.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.00 | 2.01 | 7.77 | 4.04 |

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

### SULPHUR DIOXIDE

| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg S Total | µgS - Blank | $SO_2$ $\mu g/m^3$ * | $SO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001941 | 1.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.90 | 1.91 | 7.80 | 2.93 |
| 001942 | 2.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.16 | 2.15 | 7.61 | 2.85 |
| 001943 | 3.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.12 | 2.11 | 7.65 | 2.87 |
| 001944 | 4.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.10 | 2.11 | 7.49 | 2.81 |
| 001945 | 5.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.18 | 2.17 | 8.45 | 3.17 |
| 001946 | 6.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.02 | 2.02 | 8.75 | 3.28 |
| 001947 | 7.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.93 | 1.92 | 8.92 | 3.35 |
| 001948 | 8.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.92 | 1.91 | 8.47 | 3.18 |
| 001949 | 9.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.99 | 1.98 | 8.24 | 3.09 |
| 001950 | 10.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.97 | 1.96 | 7.82 | 2.93 |
| 001951 | 11.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.89 | 1.90 | 8.27 | 3.10 |
| 001952 | 12.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.98 | 1.99 | 8.59 | 3.22 |
| 001953 | 13.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.10 | 2.11 | 8.44 | 3.16 |
| 001954 | 14.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 2.04 | 2.05 | 8.62 | 3.23 |
| 001955 | 15.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.92 | 1.93 | 9.34 | 3.50 |
| 001956 | 16.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.90 | 1.91 | 9.44 | 3.54 |
| 001957 | 17.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.92 | 1.93 | 9.52 | 3.57 |
| 001958 | 18.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.90 | 1.91 | 9.58 | 3.59 |
| 001959 | 19.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.92 | 1.93 | 8.94 | 3.35 |
| 001960 | 20.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.90 | 1.91 | 9.01 | 3.38 |
| 001961 | 21.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.92 | 1.93 | 8.79 | 3.30 |
| 001962 | 22.Lokasyon/Turkey | 19.09.22 | 18.10.22 | 720.00 | 1.90 | 1.91 | 8.31 | 3.12 |
| 001963 | 23.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.92 | 1.93 | 8.87 | 3.33 |
| 001964 | 24.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.90 | 1.91 | 8.62 | 3.23 |
| 001965 | 25.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.92 | 1.93 | 9.51 | 3.57 |
| 001966 | 26.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.90 | 1.91 | 9.26 | 3.47 |
| 001967 | 27.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.92 | 1.93 | 8.82 | 3.31 |
| 001968 | 28.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.90 | 1.91 | 8.78 | 3.29 |
| 001969 | 29.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.92 | 1.93 | 9.42 | 3.53 |

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced. except in full. without the written permission of Gradko International Ltd.



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L. Gates, Laboratory Manager

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St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

ilac-MRA UKAS TESTING 2187

# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg S Total | µgS - Blank | SULPHUR DIOXIDE $SO_2$ $\mu g/m^3$ * | $SO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001970 | 30.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 9.27 | 3.48 |
| 001971 | 31.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.98 | 1.97 | 9.10 | 3.41 |
| 001972 | 32.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.89 | 1.90 | 8.93 | 3.35 |
| 001973 | 33.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.16 | 2.15 | 8.38 | 3.14 |
| 001974 | 34.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.12 | 2.11 | 8.28 | 3.11 |
| 001975 | 35.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.90 | 1.90 | 8.09 | 3.03 |
| 001976 | 36.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.01 | 2.01 | 8.50 | 3.19 |
| 001977 | 37.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.00 | 2.01 | 8.39 | 3.15 |
| 001978 | 38.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.02 | 2.01 | 8.74 | 3.28 |
| 001979 | 39.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.90 | 1.90 | 8.93 | 3.35 |
| 001980 | 40.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.92 | 1.92 | 9.17 | 3.44 |
| 001981 | 41.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.06 | 2.06 | 9.35 | 3.51 |
| 001982 | 42.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.06 | 2.05 | 9.14 | 3.43 |
| 001983 | 43.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 2.01 | 2.01 | 8.23 | 3.08 |
| 001984 | 44.Lokasyon/Turkey | 20.09.22 | 19.10.22 | 720.00 | 1.93 | 1.94 | 8.65 | 3.24 |
| 001985 | 45.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 8.09 | 3.03 |
| 001986 | 46.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 7.88 | 2.96 |
| 001987 | 47.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 8.64 | 3.24 |
| 001988 | 48.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 9.77 | 3.66 |
| 001989 | 49.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 8.62 | 3.23 |
| 001990 | 50.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 8.85 | 3.32 |
| 001991 | 51.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 10.97 | 4.11 |
| 001992 | 52.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 8.34 | 3.13 |
| 001993 | 53.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 9.63 | 3.61 |
| 001994 | 54.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 10.78 | 4.04 |
| 001995 | 55.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 9.22 | 3.46 |
| 001996 | 56.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.91 | 1.92 | 9.97 | 3.74 |

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced. except in full. without the written permission of Gradko International Ltd.



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L. Gates, Laboratory Manager

gradko environmental
(A division of Gradko International Ltd.)
St. Martins House, 77 Wales Street Winchester, Hampshire SO23 0RH
tel.: 01962 860331 fax: 01962 841339 e-mail:diffusion@gradko.co.uk

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# LABORATORY ANALYSIS REPORT

## DETERMINATION OF ACID GASES IN DIFFUSION TUBES BY ION CHROMATOGRAPHY

**SULPHUR DIOXIDE**

| Tube Identification | | Date On | Date Off | Exposure (hrs) | µg S Total | µgS - Blank | $SO_2$ µg/m$^3$ * | $SO_2$ ppb* |
|---|---|---|---|---|---|---|---|---|
| 001997 | 57.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 8.54 | 3.20 |
| 001998 | 58.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 9.97 | 3.74 |
| 001999 | 59.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.91 | 1.91 | 7.99 | 3.00 |
| 002000 | 60.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.05 | 2.05 | 7.80 | 2.93 |
| 002001 | 61.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.05 | 2.04 | 8.20 | 3.07 |
| 002002 | 62.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 8.10 | 3.04 |
| 002003 | 63.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.02 | 2.03 | 8.35 | 3.13 |
| 002004 | 64.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 1.93 | 1.94 | 7.80 | 2.93 |
| 002005 | 65.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.01 | 2.02 | 7.61 | 2.85 |
| 002006 | 66.Lokasyon/Turkey | 21.09.22 | 20.10.22 | 720.00 | 2.00 | 2.01 | 7.33 | 2.75 |

(RESULTS ARE BLANK CORRECTED)

**OVERALL M.U.** ±14.8% **REPORTING LIMIT** 0.03µg S

Analysed on Dionex ICS1100 ICU10 **ANALYST NAME** J Reynold

**DATE OF ANALYSIS** 27/10/2022 **DATE OF REPORT** 31/10/2022

ANALYSIS HAS BEEN CARRIED OUT IN ACCORDANCE WITH IN-HOUSE METHOD GLM3

The Diffusion Tubes have been tested within the scope of Gradko International Ltd. Laboratory Quality Procedures calculations and assessments involving the exposure procedures and periods provided by the client are not within the scope of our UKAS accreditation. Those results obtained using exposure data shall be indicated by an asterisk. Any queries concerning the data in this report should be directed to the Laboratory Manager Gradko International Ltd. This report is not to be reproduced. except in full. without the written permission of Gradko International Ltd.



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L. Gates, Laboratory Manager

# BATI LABORATUVARI

ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. MÜŞ. SAN. VE TİC. LTD. ŞTİ
İNÖNÜ MAH. YILDIRIMLAR SAN. SİT. 1738. SOK.
1/10 KAT:6 BATIKENT ANKARA


TÜRKAK
AB-0946-T

# HAVA KALİTESİ ÖLÇÜMLERİ SONUÇ RAPORU

| | |
|---|---|
| ***Müşterinin Adı/Adresi:***<br>Customer Name/Address | **KINALI - MALKARA YÜKSEK HIZLI TREN PROJESİ**<br><br>Kınalı - Malkara |
| ***Müşterinin Telefonu/Faksı:***<br>Customer Phone/Fax | Telefon: - Fax: - |
| ***Talep Numarası:***<br>Order No. | TP-22-138 |
| ***Numunenin Adı ve Tarifi:***<br>Name And Identity Of The Test Item | Hava Kalitesi Ölçümleri |
| ***Ölçümün Yapıldığı Tarih:***<br>Date Of Test | 19-20-21.09.2022 / 18-19-20.10.2022<br>17-18-19.11.2022 |
| ***Raporun Numarası ve Tarihi:***<br>Number And Date Of The Report | R-21-138/3 \| 30.11.2022 |

BATI LABORATUVARI ANKARA

**KASIM 2022**

# BATI LABORATUVARI®

**ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH.**
**SAN. VE TİC. LTD. ŞTİ.**
**İNÖNÜ MAH. YILDIRIMLAR SAN. SİT. 1738. SOK.**
**1/10 KAT:6 BATIKENT ANKARA**
**Tel: 0312 250 84 85, Fax:0312 278 48 86**
**E-Mail:** info@batilaboratuvari.com.tr

TÜRKAK
Test
TS EN ISO/IEC 17025
AB-0946-T

| |
|---|
| AB-0946-T |
| R-22-138/3 |
| 11-22 |

**Deney Raporu** / *Test Report*

| | |
|---|---|
| ***Müşterinin Adı/Adresi:*** Customer Name/Address | **KINALI - MALKARA YÜKSEK HIZLI TREN PROJESİ** Kınalı - Malkara |
| ***Müşterinin Telefonu/Faksı:*** Customer Phone/Fax | Telefon: - / Fax: - |
| ***Talep Numarası:*** Order No. | TP-22-138 |
| ***Numunenin Adı ve Tarifi:*** Name and İdentity of the Test İtem | Hava Kalitesi Ölçümü |
| ***Numunenin Kabul Tarihi ve Numarası:*** The Date and Number of Receipt of the Test İtem | 22.09.2022 – 21.10.2022 – 20.11.2022 / NK-22-138 |
| ***Açıklamalar:*** Remark | - |
| ***Ölçümün Yapıldığı Tarih:*** Date of Test | 19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022 |
| ***Raporun Sayfa Sayısı:*** Number of Pages of the Report | 34 (Kapak Sayfaları Hariç) |

***Deney Laboratuvarı olarak faaliyet gösteren BATI LABORATUVARI, TÜRKAK'tan AB-0946-T ile TS-EN ISO/IEC 17025 standardına göre akredite edilmiştir.***

*BATI LABORATUVARI accredited by TÜRKAK under registration number AB-0946-T for TS-EN ISO/IEC 17025 as test laboratory.*

***Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.***

*Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) fort he recognition of test reports*

***Deney ve/veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.***

*The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.S*

| ***Tarih/Mühür*** Date/Seal | ***Deneyi Yapan*** Test Done by | ***Raporu Hazırlayan*** Report Prepared by | ***Onay*** Approved by |
|---|---|---|---|
| **30.11.2022** | **B.Barbaros YÜCE** Deney Sorumlusu | **Melek ERCAN** Rapor Sorumlusu | |

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan Hava Kalitesi Ölçümleri için geçerli olup Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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Rapor No: R-22-138/3

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## A. GİRİŞ

Bu rapor aşağıda açık adresi belirtilen tesiste gerçekleştirilen hava kalitesi ölçümleri sonucunda hazırlanmıştır.

**Ölçüm Tarihi** : 19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022

**Ölçüm Yeri** : **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ**

**Tesis Adresi** : KINALI -MALKARA

**Tablo 1:** Ölçüm Nokası Bilgileri

| ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|
| 1.NOKTA | 506304 | 4525649 |
| 2.NOKTA | 507026 | 4525865 |
| 3.NOKTA | 512447 | 4524860 |
| 4.NOKTA | 508327 | 4528503 |
| 5.NOKTA | 511329 | 4529048 |
| 6.NOKTA | 512481 | 4527410 |
| 7.NOKTA | 514647 | 4529428 |
| 8.NOKTA | 517267 | 4531152 |
| 9.NOKTA | 518048 | 4529257 |
| 10.NOKTA | 520889 | 4531560 |
| 11.NOKTA | 523258 | 4530892 |
| 12.NOKTA | 523424 | 4532271 |
| 13.NOKTA | 525104 | 4531792 |
| 14.NOKTA | 526810 | 4533248 |
| 15.NOKTA | 527803 | 4532372 |
| 16.NOKTA | 529586 | 4535472 |
| 17.NOKTA | 526412 | 4540054 |
| 18.NOKTA | 529123 | 4539993 |
| 19.NOKTA | 531279 | 4536789 |
| 20.NOKTA | 532720 | 4533451 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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| ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|
| 21.NOKTA | 531830 | 4540355 |
| 22.NOKTA | 536037 | 4539504 |
| 23.NOKTA | 536539 | 4538863 |
| 24.NOKTA | 537824 | 4539890 |
| 25.NOKTA | 539411 | 4540869 |
| 26.NOKTA | 540434 | 4541505 |
| 27.NOKTA | 540971 | 4541733 |
| 28.NOKTA | 543152 | 4541306 |
| 29.NOKTA | 544184 | 4540051 |
| 30.NOKTA | 544146 | 4541848 |
| 31.NOKTA | 545253 | 4541473 |
| 32.NOKTA | 546711 | 4539397 |
| 33.NOKTA | 548595 | 4539816 |
| 34.NOKTA | 548702 | 4539432 |
| 35.NOKTA | 549591 | 4541426 |
| 36.NOKTA | 550732 | 4538571 |
| 37.NOKTA | 552631 | 4538392 |
| 38.NOKTA | 553205 | 4542666 |
| 39.NOKTA | 552391 | 4544142 |
| 40.NOKTA | 555979 | 4543689 |
| 41.NOKTA | 560252 | 4541820 |
| 42.NOKTA | 562560 | 4548340 |
| 43.NOKTA | 568345 | 4548605 |
| 44.NOKTA | 569553 | 4546810 |
| 45.NOKTA | 570179 | 4544497 |
| 46.NOKTA | 571561 | 4544339 |
| 47.NOKTA | 574485 | 4548016 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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| ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|
| 48.NOKTA | 575243 | 4549478 |
| 49.NOKTA | 578865 | 4549326 |
| 50.NOKTA | 576553 | 4551925 |
| 51.NOKTA | 576083 | 4547951 |
| 52.NOKTA | 580170 | 4547562 |
| 53.NOKTA | 580496 | 4543970 |
| 54.NOKTA | 580800 | 4538257 |
| 55.NOKTA | 584542 | 4543854 |
| 56.NOKTA | 585305 | 4548356 |
| 57.NOKTA | 588165 | 4548686 |
| 58.NOKTA | 586482 | 4550068 |
| 59.NOKTA | 588893 | 4551243 |
| 60.NOKTA | 588814 | 4554537 |
| 61.NOKTA | 590046 | 4559119 |
| 62.NOKTA | 591885 | 4549968 |
| 63.NOKTA | 594479 | 4549787 |
| 64.NOKTA | 596095 | 4549550 |
| 65.NOKTA | 595540 | 4551890 |
| 66.NOKTA | 599081 | 4551537 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**B. ÖLÇÜM RAPORLARI**

# 1.HAVA KALİTESİ ÖLÇÜM RAPORU

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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### i. Giriş

2872 sayılı Çevre Kanunu'nun ilgili hükümleri gereğince 03.07.2009 tarih ve 27277 sayılı Resmi Gazete'de yayınlanan "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği" ve değişiklik yapılmasına dair yönetmelikler (S.K.H.K.K.Y.), her türlü sanayi ve enerji üretim tesislerinden kaynaklanan hava kirliliği seviyelerine sınırlamalar getirmekte ve bu kirletici kaynakları "Tesis" olarak tanımlayarak çevresindeki hava kirliliğinin ölçüm ve denetimini zorunlu kılmaktadır. Bu yönetmelik gereğince yukarıda verilen tarihler arasında belirlenen noktalarda çöken toz tayinleri ölçümü yapılmış ve "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği" esas alınarak bu rapor hazırlanmıştır.

### ii. Ölçüm Metotları

Ölçümler aşağıda verilen standartlar çerçevesinde gerçekleştirilmiştir.

| | |
|---|---|
| **TS 2342** | **NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS** |

### iii. İlgili Yönetmelik Maddeleri

S.K.H.K.K.Y. Ek-2 gereğince, mevcut tesislerin etki alanında Hava Kirlenmesine Katkı Değeri (H.K.K.D.)' nin dağılım modellemesi kullanılarak hesaplanması, tesis etki alanında hava kalitesinin ölçülmesi ve ölçüm metotları aşağıdaki esaslara göre yapılır:

Çöken toz ölçümü:

Çöken toz ölçümü sırasında tesis inceleme alanı içinde en az 2 (iki) ölçüm noktasında hakim rüzgar yönü dikkate alınır. Aynı bölgede toz emisyonuna neden olan başka kaynakların da bulunması durumunda ölçüm noktası sayısı tesis dışındaki diğer kaynakların katkılarının belirlenmesi için attırılabilir. Ölçüm süresi birer aylık ölçümlerdir. Aylık olarak bulunacak değerler gün sayısına bölünerek bir günde çöken ortalama toz miktarı hesaplanır.

Bir ay süre ile yapılan hava kalitesi ölçümlerinin aritmetik ortalaması, Ek-2 de belirtilen Uzun Vade Sınır Değerin % 60'ının üzerinde olması durumunda ölçüm süresi yetkili merci tarafından uzatılır ve istasyon sayısı artırılabilir.

Hava kalitesi ölçümleri kural olarak yer seviyesinden, 1,5 - 4,0 metre arasındaki yüksekliklerde, binadan (veya ekili alandan) en az 1,5 metre yan mesafe tutularak yapılır. Ormanda yapılan ölçümler, ağaç yüksekliğinden daha yukarıda yapılmalıdır.

### iv. Ölçme Metotları:

Metotların kabul edilebilirlikleri TSE tarafından standartlaştırıldıktan ve Bakanlıkça tebliğ edildikten sonra tescil edilir. İlgili TSE Standardı mevcut değilse, güvenilirliği Bakanlıkça kabul edilen DIN, EPA normlarına uygun metot standartları tatbik edilir. Metotlar tebliği ile ilan edilir.

Ölçüm Yapacak Kurum ve Kuruluşlar:

Tesis etki alanında hava kalitesi ve emisyon ölçümleri, akredite edilmiş veya Bakanlıkça uygun bulunan laboratuarlara sahip olan özel veya kamu kurum kuruluşları tarafından yapılır.

A - Uzun Vadeli Sınır Değerleri (UVS) : Aşılmaması gereken, bütün ölçüm sonuçlarının aritmetik ortalaması olan değerlerdir.

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B - Kısa Vadeli Sınır Değerleri (KVS) : Maksimum günlük ortalama değerler veya istatistik olarak bütün ölçüm sonuçları sayısal değerlerinin büyüklüğüne göre dizildiğinde, ölçüm sonuçlarının % 95'ini aşmaması gereken değerlerdir.

Hava kirleticileri (Çöken Toz) için uyulması gereken sınır değerler aşağıda verilmiştir.

**S.K.H.K.K.Y Tablo 2.2** Tesis Etki Alanında Hava Kalitesi Sınır Değerleri

| Parametre | | Süre | Birimi | YIL | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2014 | 2015 | 2016 | 2017 | 2018 | 2019-2023 | 2024 ve sonrası |
| $SO_2$ | | Saatlik (Bir Yılda 24 Defadan Fazla Aşılmaz) | µg/m³ | 500 | 470 | 440 | 410 | 380 | 350 | 350 |
| | | 24 Saatlik | | 250 | 225 | 200 | 175 | 150 | 125 | 125 |
| | | UVS | | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| | | **Yıllık ve kış dönemi (1 Ekim-31 Mart) | | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| $NO_2$ | | Saatlik (bir yılda 18 defadan fazla aşılmaz) | µg/m³ | 300 | 290 | 280 | 270 | 260 | 250 | 200* |
| | | yıllık | | 60 | 56 | 52 | 48 | 44 | 40* | 40 |
| Havada Asılı Partikül Madde (PM 10) | | 24 saatlik (bir yılda 35 defadan fazla aşılmaz) | µg/m³ | 100 | 90 | 80 | 70 | 60 | 50 | 50 |
| | | Yıllık | | 60 | 56 | 52 | 48 | 44 | 40 | 40 |
| Pb | | Yıllık | µg/m³ | 1 | 0,9 | 0,8 | 0,7 | 0,6 | 0,5 | 0,5 |
| CO | | maksimum günlük 8 saatlik ortalama | mg/m³ | 16 | 14 | 12 | 10 | 10 | 10 | 10 |
| Cd | | UVS | µg/m³ | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0,02 |
| HCl | | KVS | µg/m³ | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| | | UVS | | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| HF | | Saatlik | µg/m³ | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| | | KVS | | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| $H_2S$ | | Saatlik | µg/m³ | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | | KVS | | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Toplam Organik Bileşikler (karbon cinsinden) | | Saatlik | µg/m³ | 280 | 280 | 280 | 280 | 280 | 280 | 280 |
| | | KVS | | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Çöken toz | | KVS | mg/m²gün | 390 | 390 | 390 | 390 | 390 | 390 | 390 |
| | | UVS | | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| Çöken tozda | Pb ve Bileşikleri | UVS | mg/m²gün | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | Cd e Bileşikleri | UVS | | 3,75 | 3,75 | 3,75 | 3,75 | 3,75 | 3,75 | 3,75 |
| | Tl Ve Bileşikleri | UVS | | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

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### v. Kullanılan Cihazlar

Çöken toz cihazları TS 2342'de belirtildiği üzere yaptırılmış, 4 yönlü çöken toz ölçüm cihazlarıdır. 4 yönlü çöken toz cihazları ve kaplarda bulunan filtreler, darası alınmış 47 mm çapında quartz filtre, pens, petrislayt, etüv, soğutma işlemi sırasında nemden etkilenmemesi için şartlandırılmış oda, örneklenen filtrelerin tartımı için hassas terazi.

### vi. Ölçüm Prensipleri

Emisyon sonuçlarının doğru ve hatasız olması, doğru bir ölçüm tekniği kullanılmasına bağlı olduğu kadar, ölçümün genel prensiplerine de bağlıdır.
Laboratuvarımız, emisyon raporlarının hazırlanmasında sahada yaptığı ölçümler kadar laboratuardaki ön hazırlık ve ölçüm öncesi kontrollerle de doğru ve güvenli sonuçlara ulaşmayı sağlamaktadır. Bu sebeple emisyon analizleri üç aşamalı olarak yapılmaktadır.

### vii. Ön Hazırlık

Ölçüm öncesi, cihazlar laboratuvardan çıkarılmadan Laboratuar Müdürü gözetiminde yetkili personel tarafından kontrol edilir ve ölçüm ekibine teslim edilir.

### viii. Ölçüm Noktalarının Belirlenmesi

Ölçüm noktaları seçilirken, yerin makro çevre ölçeği (deney yerinin tipi) ve mikro çevre ölçeği (doğrudan istasyonu çevreleyen alan) bakımından bütünlüğüne gereken özen gösterilir.

### ix. Ölçüm ve Analiz İşlemi

Örnekleme işleminde toz filtrede toplanır ve laboratuvar şartlarında gravimetrik olarak tayin edilir. Çöken toz kaplarında toplanan toz laboratuvar koşullarında 47 mm kuartz filtreden geçirilip kalan miktar gravimetrik olarak tayin edilir.

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### i. Ölçüm Sonuçları

Belirlenen lokasyonlarda yapılan ölçümler sonucunda elde edilen değerler aşağıda verilmiştir.

**Tablo 2:** Hava Kalitesi (Çöken Toz) Lokasyonları

| ÖLÇÜM NOKTASI NUMARASI | ÖLÇÜM BAŞLANGIÇ TARİHİ | KAP DEĞİŞİM TARİHİ | ÖLÇÜM BİTİŞ TARİHİ | LOKASYON BİLGİSİ | |
|---|---|---|---|---|---|
| 1.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 506304 | 4525649 |
| 2.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 507026 | 4525865 |
| 3.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 512447 | 4524860 |
| 4.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 508327 | 4528503 |
| 5.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 511329 | 4529048 |
| 6.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 512481 | 4527410 |
| 7.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 514647 | 4529428 |
| 8.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 517267 | 4531152 |
| 9.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 518048 | 4529257 |
| 10.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 520889 | 4531560 |
| 11.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 523258 | 4530892 |
| 12.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 523424 | 4532271 |
| 13.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 525104 | 4531792 |
| 14.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 526810 | 4533248 |
| 15.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 527803 | 4532372 |
| 16.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 529586 | 4535472 |
| 17.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 526412 | 4540054 |
| 18.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 529123 | 4539993 |
| 19.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 531279 | 4536789 |
| 20.NOKTA | 19.09.2022 | 18.10.2022 | 17.11.2022 | 532720 | 4533451 |
| 21.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 531830 | 4540355 |
| 22.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 536037 | 4539504 |
| 23.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 536539 | 4538863 |
| 24.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 537824 | 4539890 |
| 25.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 539411 | 4540869 |
| 26.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 540434 | 4541505 |
| 27.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 540971 | 4541733 |
| 28.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 543152 | 4541306 |
| 29.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 544184 | 4540051 |

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|---|---|---|---|---|---|
| 30.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 544146 | 4541848 |
| 31.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 545253 | 4541473 |
| 32.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 546711 | 4539397 |
| 33.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 548595 | 4539816 |
| 34.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 548702 | 4539432 |
| 35.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 549591 | 4541426 |
| 36.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 550732 | 4538571 |
| 37.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 552631 | 4538392 |
| 38.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 553205 | 4542666 |
| 39.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 552391 | 4544142 |
| 40.NOKTA | 20.09.2022 | 19.10.2022 | 18.11.2022 | 555979 | 4543689 |
| 41.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 560252 | 4541820 |
| 42.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 562560 | 4548340 |
| 43.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 568345 | 4548605 |
| 44.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 569553 | 4546810 |
| 45.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 570179 | 4544497 |
| 46.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 571561 | 4544339 |
| 47.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 574485 | 4548016 |
| 48.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 575243 | 4549478 |
| 49.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 578865 | 4549326 |
| 50.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 576553 | 4551925 |
| 51.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 576083 | 4547951 |
| 52.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 580170 | 4547562 |
| 53.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 580496 | 4543970 |
| 54.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 580800 | 4538257 |
| 55.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 584542 | 4543854 |
| 56.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 585305 | 4548356 |
| 57.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 588165 | 4548686 |
| 58.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 586482 | 4550068 |
| 59.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 588893 | 4551243 |
| 60.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 588814 | 4554537 |
| 61.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 590046 | 4559119 |

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|---|---|---|---|---|---|
| 62.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 591885 | 4549968 |
| 63.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 594479 | 4549787 |
| 64.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 596095 | 4549550 |
| 65.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 595540 | 4551890 |
| 66.NOKTA | 21.09.2022 | 20.10.2022 | 19.11.2022 | 599081 | 4551537 |

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**1.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15150** | 107,73 | 101,48 | 93,69 | 90,79 | 102,94 | 90,13 | 89,45 | 83,67 | 98,42 | 91,55 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **94,99** | **98,42** |
| **Katkı Oranları (%)** | | | | | | | | | **45,23%** | **25,24%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**2.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15151** | 124,53 | 114,89 | 108,23 | 99,92 | 111,25 | 99,32 | 90,95 | 84,51 | 111,89 | 96,51 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **104,20** | **111,89** |
| **Katkı Oranları (%)** | | | | | | | | | **49,62%** | **28,69%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**3.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15152** | 111,97 | 103,30 | 97,32 | 89,85 | 100,04 | 89,31 | 81,78 | 77,11 | 100,61 | 87,06 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **93,83** | **100,61** |
| **Katkı Oranları (%)** | | | | | | | | | **44,68%** | **25,80%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**4.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15153** | 102,18 | 94,48 | 79,82 | 74,29 | 86,69 | 81,38 | 74,36 | 65,66 | 87,69 | 77,02 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **82,36** | **87,69** |
| **Katkı Oranları (%)** | | | | | | | | | **39,22%** | **22,49%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**5.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15154** | 115,20 | 106,52 | 101,37 | 83,75 | 97,73 | 91,75 | 83,83 | 74,03 | 101,71 | 86,83 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **94,27** | **101,71** |
| **Katkı Oranları (%)** | | | | | | | | | **44,89%** | **26,08%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**6.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15155** | 122,69 | 113,20 | 106,64 | 98,45 | 109,61 | 97,86 | 89,61 | 79,72 | 110,25 | 94,20 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **102,22** | **110,25** |
| **Katkı Oranları (%)** | | | | | | | | | **48,68%** | **28,27%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**7.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15156** | 89,59 | 81,25 | 76,83 | 63,14 | 76,93 | 70,33 | 56,24 | 52,51 | 77,70 | 64,00 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **70,85** | **77,70** |
| **Katkı Oranları (%)** | | | | | | | | | **33,74%** | **19,92%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**8.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15157** | 106,58 | 100,77 | 87,43 | 77,61 | 92,23 | 81,41 | 68,41 | 55,36 | 93,10 | 74,35 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **83,72** | **93,10** |
| **Katkı Oranları (%)** | | | | | | | | | **39,87%** | **23,87%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**9.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15158** | 77,54 | 73,31 | 63,60 | 54,66 | 67,10 | 59,23 | 49,77 | 45,13 | 67,28 | 55,31 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **61,29** | **67,28** |
| **Katkı Oranları (%)** | | | | | | | | | **29,19%** | **17,25%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**10.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15159** | 108,09 | 102,20 | 88,67 | 76,19 | 93,53 | 82,56 | 75,39 | 62,91 | 93,79 | 78,60 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **86,19** | **93,79** |
| **Katkı Oranları (%)** | | | | | | | | | **41,04%** | **24,05%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**11.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15160** | 93,99 | 88,05 | 81,83 | 70,97 | 85,72 | 77,59 | 69,84 | 66,24 | 83,71 | 74,85 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **79,28** | **83,71** |
| **Katkı Oranları (%)** | | | | | | | | | **37,75%** | **21,46%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**12.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15161** | 110,62 | 104,59 | 90,74 | 77,98 | 95,72 | 84,50 | 71,00 | 64,38 | 95,98 | 78,90 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **87,44** | **95,98** |
| **Katkı Oranları (%)** | | | | | | | | | **41,64%** | **24,61%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**13.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15162 | 97,40 | 89,18 | 85,12 | 77,68 | 83,61 | 79,42 | 67,79 | 62,26 | 87,34 | 73,27 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 80,31 | 87,34 |
| Katkı Oranları (%) | | | | | | | | | 38,24% | 22,40% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**14.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15163 | 102,94 | 94,25 | 89,97 | 82,10 | 88,36 | 83,94 | 71,65 | 65,81 | 92,31 | 77,44 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 84,88 | 92,31 |
| Katkı Oranları (%) | | | | | | | | | 40,42% | 23,67% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**15.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15164 | 81,27 | 74,80 | 62,36 | 53,33 | 71,64 | 61,28 | 55,80 | 50,65 | 67,94 | 59,84 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 63,89 | 67,94 |
| Katkı Oranları (%) | | | | | | | | | 30,42% | 17,42% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**16.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15165 | 110,72 | 104,95 | 98,27 | 92,74 | 102,28 | 90,28 | 75,86 | 67,15 | 110,72 | 104,95 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 92,78 | 101,67 |
| Katkı Oranları (%) | | | | | | | | | 44,18% | 26,07% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**17.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15166** | 91,23 | 81,83 | 76,04 | 65,95 | 79,66 | 72,11 | 64,42 | 58,02 | 78,76 | 68,55 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **73,66** | **78,76** |
| **Katkı Oranları (%)** | | | | | | | | | **35,07%** | **20,20%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**18.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15167** | 103,18 | 99,25 | 90,19 | 82,63 | 93,05 | 85,32 | 76,60 | 66,41 | 93,81 | 80,35 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **87,08** | **93,81** |
| **Katkı Oranları (%)** | | | | | | | | | **41,47%** | **24,05%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**19.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15168** | 89,25 | 83,08 | 76,26 | 70,18 | 80,49 | 71,83 | 62,87 | 57,46 | 79,69 | 68,16 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **73,93** | **79,69** |
| **Katkı Oranları (%)** | | | | | | | | | **35,20%** | **20,43%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**20.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15169** | 77,86 | 73,29 | 66,52 | 61,23 | 70,22 | 63,37 | 57,11 | 50,12 | 69,72 | 60,20 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **64,96** | **69,72** |
| **Katkı Oranları (%)** | | | | | | | | | **30,94%** | **17,88%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**21.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15170 | 85,67 | 73,64 | 67,60 | 62,22 | 77,22 | 68,10 | 55,73 | 50,93 | 72,28 | 62,99 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 67,64 | 72,28 |
| Katkı Oranları (%) | | | | | | | | | 32,21% | 18,53% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**22.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15171 | 94,18 | 81,80 | 74,31 | 66,61 | 84,88 | 74,30 | 64,29 | 55,99 | 79,22 | 69,86 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 74,54 | 79,22 |
| Katkı Oranları (%) | | | | | | | | | 35,50% | 20,31% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**23.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15172 | 75,89 | 65,23 | 59,88 | 55,12 | 68,40 | 60,32 | 49,37 | 45,11 | 64,03 | 55,80 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 59,92 | 64,03 |
| Katkı Oranları (%) | | | | | | | | | 28,53% | 16,42% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**24.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15173 | 71,28 | 64,67 | 56,24 | 48,13 | 64,24 | 56,66 | 48,02 | 44,02 | 60,08 | 53,23 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 56,66 | 60,08 |
| Katkı Oranları (%) | | | | | | | | | 26,98% | 15,40% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**25.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15174 | 82,93 | 71,29 | 65,43 | 60,23 | 74,75 | 65,92 | 53,95 | 49,30 | 69,97 | 60,98 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 65,48 | 69,97 |
| Katkı Oranları (%) | | | | | | | | | 31,18% | 17,94% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**26.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15175 | 98,70 | 84,83 | 77,87 | 71,68 | 88,96 | 78,45 | 64,20 | 58,67 | 83,27 | 72,57 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 77,92 | 83,27 |
| Katkı Oranları (%) | | | | | | | | | 37,10% | 21,35% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**27.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15176 | 85,91 | 76,00 | 66,43 | 61,61 | 78,53 | 69,28 | 59,54 | 54,64 | 72,49 | 65,49 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 68,99 | 72,49 |
| Katkı Oranları (%) | | | | | | | | | 32,85% | 18,59% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**28.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15177 | 89,87 | 82,89 | 79,01 | 63,09 | 80,78 | 73,00 | 66,77 | 57,19 | 78,71 | 69,44 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 74,07 | 78,71 |
| Katkı Oranları (%) | | | | | | | | | 35,27% | 20,18% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**29.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15178 | 98,89 | 85,89 | 78,02 | 71,93 | 89,12 | 80,86 | 70,01 | 60,49 | 83,68 | 75,12 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 79,40 | 83,68 |
| Katkı Oranları (%) | | | | | | | | | 37,81% | 21,46% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

**30.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15179 | 85,96 | 77,65 | 72,30 | 59,94 | 76,39 | 68,68 | 62,88 | 54,54 | 73,96 | 65,62 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 69,79 | 73,96 |
| Katkı Oranları (%) | | | | | | | | | 33,23% | 18,96% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

**31.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15180 | 102,02 | 90,63 | 83,77 | 70,71 | 90,40 | 80,37 | 74,41 | 63,60 | 86,78 | 77,19 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 81,99 | 86,78 |
| Katkı Oranları (%) | | | | | | | | | 39,04% | 22,25% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

**32.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15181 | 88,76 | 79,05 | 73,39 | 61,17 | 77,13 | 68,09 | 62,28 | 53,84 | 75,59 | 65,33 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 70,46 | 75,59 |
| Katkı Oranları (%) | | | | | | | | | 33,55% | 19,38% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**33.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15182 | 79,77 | 70,07 | 64,78 | 55,67 | 70,19 | 62,82 | 55,61 | 50,06 | 67,57 | 59,67 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 63,62 | 67,57 |
| Katkı Oranları (%) | | | | | | | | | 30,29% | 17,33% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**34.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15183 | 95,16 | 84,16 | 77,66 | 66,56 | 83,72 | 74,77 | 68,84 | 58,98 | 80,89 | 71,58 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 76,23 | 80,89 |
| Katkı Oranları (%) | | | | | | | | | 36,30% | 20,74% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**35.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15184 | 100,87 | 92,95 | 84,49 | 74,40 | 88,55 | 81,90 | 76,72 | 63,51 | 88,18 | 77,67 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 82,92 | 88,18 |
| Katkı Oranları (%) | | | | | | | | | 39,49% | 22,61% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

**36.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15185 | 90,46 | 84,02 | 76,37 | 69,44 | 80,27 | 74,53 | 66,13 | 57,40 | 80,07 | 69,58 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün) | | | | | | | | | 74,82 | 80,07 |
| Katkı Oranları (%) | | | | | | | | | 35,63% | 20,53% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün) | | | | | | | | | 210 | 390 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**37.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15186** | 83,98 | 76,88 | 65,85 | 55,00 | 73,04 | 63,88 | 56,97 | 48,44 | 70,43 | 60,58 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **65,50** | **70,43** |
| **Katkı Oranları (%)** | | | | | | | | | **31,19%** | **18,06%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**38.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15187** | 89,66 | 79,52 | 72,13 | 61,50 | 81,21 | 71,91 | 62,90 | 57,33 | 75,70 | 68,34 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **72,02** | **75,70** |
| **Katkı Oranları (%)** | | | | | | | | | **34,29%** | **19,41%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**39.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15188** | 93,68 | 82,87 | 72,43 | 67,18 | 87,59 | 75,53 | 64,92 | 59,58 | 79,04 | 71,91 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **75,47** | **79,04** |
| **Katkı Oranları (%)** | | | | | | | | | **35,94%** | **20,27%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**40.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15189** | 99,85 | 89,46 | 79,06 | 71,07 | 92,64 | 78,01 | 68,53 | 64,34 | 84,86 | 75,88 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **80,37** | **84,86** |
| **Katkı Oranları (%)** | | | | | | | | | **38,27%** | **21,76%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**41.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15190** | 108,81 | 93,38 | 82,04 | 70,37 | 95,27 | 83,75 | 70,23 | 58,82 | 88,65 | 77,02 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **82,83** | **88,65** |
| **Katkı Oranları (%)** | | | | | | | | | **39,44%** | **22,73%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**42.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15191** | 88,89 | 80,62 | 75,20 | 62,64 | 76,33 | 69,78 | 57,91 | 52,10 | 76,84 | 64,03 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **70,43** | **76,84** |
| **Katkı Oranları (%)** | | | | | | | | | **33,54%** | **19,70%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**43.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15192** | 106,75 | 100,93 | 87,57 | 77,74 | 92,38 | 81,55 | 68,52 | 62,13 | 93,25 | 76,14 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **84,70** | **93,25** |
| **Katkı Oranları (%)** | | | | | | | | | **40,33%** | **23,91%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**44.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15193** | 95,87 | 90,64 | 78,64 | 67,58 | 82,96 | 73,23 | 61,54 | 55,80 | 83,18 | 68,38 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **75,78** | **83,18** |
| **Katkı Oranları (%)** | | | | | | | | | **36,09%** | **21,33%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**45.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15194** | 103,42 | 97,78 | 84,83 | 72,90 | 89,50 | 79,00 | 72,13 | 60,19 | 89,73 | 75,21 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **82,47** | **89,73** |
| **Katkı Oranları (%)** | | | | | | | | | **39,27%** | **23,01%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**46.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15195** | 96,20 | 90,12 | 83,75 | 72,64 | 87,74 | 79,41 | 71,48 | 67,80 | 85,68 | 76,61 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **81,14** | **85,68** |
| **Katkı Oranları (%)** | | | | | | | | | **38,64%** | **21,97%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**47.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15196** | 109,25 | 97,99 | 91,06 | 78,98 | 95,40 | 86,35 | 77,14 | 69,48 | 94,32 | 82,09 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **88,21** | **94,32** |
| **Katkı Oranları (%)** | | | | | | | | | **42,00%** | **24,18%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**48.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15197** | 87,77 | 80,78 | 67,35 | 57,59 | 77,37 | 66,18 | 60,26 | 54,70 | 73,37 | 64,63 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **69,00** | **73,37** |
| **Katkı Oranları (%)** | | | | | | | | | **32,86%** | **18,81%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**49.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15198** | 101,66 | 87,39 | 80,22 | 73,83 | 91,63 | 80,81 | 66,14 | 60,43 | 85,78 | 74,75 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **80,26** | **85,78** |
| **Katkı Oranları (%)** | | | | | | | | | **38,22%** | **21,99%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**50.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15199** | 97,50 | 84,69 | 76,93 | 68,96 | 87,88 | 76,92 | 66,55 | 57,97 | 82,02 | 72,33 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **77,17** | **82,02** |
| **Katkı Oranları (%)** | | | | | | | | | **36,75%** | **21,03%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**51.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **15200** | 104,71 | 90,95 | 82,61 | 76,16 | 94,37 | 85,62 | 74,12 | 64,05 | 88,61 | 79,54 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **84,07** | **88,61** |
| **Katkı Oranları (%)** | | | | | | | | | **40,03%** | **22,72%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**52.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| **150201** | 96,09 | 85,36 | 78,90 | 66,60 | 85,15 | 75,69 | 70,08 | 59,90 | 81,74 | 72,71 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **77,22** | **81,74** |
| **Katkı Oranları (%)** | | | | | | | | | **36,77%** | **20,96%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**53.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15202 | 109,92 | 101,29 | 92,07 | 81,08 | 96,50 | 89,25 | 83,61 | 69,21 | 96,09 | 84,64 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 90,37 | 96,09 |
| Katkı Oranları (%) | | | | | | | | | 43,03% | 24,64% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

**54.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15203 | 97,69 | 90,74 | 82,47 | 74,99 | 86,69 | 80,49 | 71,42 | 61,99 | 86,47 | 75,15 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 80,81 | 86,47 |
| Katkı Oranları (%) | | | | | | | | | 38,48% | 22,17% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

**55.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15204 | 82,26 | 75,31 | 64,50 | 53,88 | 71,55 | 62,57 | 55,80 | 47,45 | 68,99 | 59,34 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 64,17 | 68,99 |
| Katkı Oranları (%) | | | | | | | | | 30,56% | 17,69% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

**56.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| Cihaz No | A | B | C | D | A | B | C | D | | |
| 15205 | 89,58 | 80,92 | 75,34 | 62,46 | 79,61 | 71,57 | 65,53 | 56,84 | 77,07 | 68,38 |
| | | | | | | | | | UVS | KVS |
| Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün) | | | | | | | | | 72,73 | 77,07 |
| Katkı Oranları (%) | | | | | | | | | 34,63% | 19,76% |
| SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün) | | | | | | | | | 210 | 390 |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**57.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15206** | 84,88 | 78,29 | 74,62 | 59,58 | 76,30 | 68,95 | 63,06 | 54,01 | 74,34 | 65,58 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **69,96** | **74,34** |
| **Katkı Oranları (%)** | | | | | | | | | **33,31%** | **19,06%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**58.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15207** | 81,60 | 75,96 | 69,72 | 64,17 | 73,59 | 65,67 | 57,48 | 52,53 | 72,86 | 62,32 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **67,59** | **72,86** |
| **Katkı Oranları (%)** | | | | | | | | | **32,19%** | **18,68%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**59.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15208** | 71,28 | 64,67 | 56,24 | 48,13 | 64,24 | 56,66 | 48,02 | 44,02 | 60,08 | 53,23 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **56,66** | **60,08** |
| **Katkı Oranları (%)** | | | | | | | | | **26,98%** | **15,40%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

**60.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15209** | 92,18 | 79,23 | 72,73 | 66,94 | 83,08 | 73,27 | 59,96 | 54,80 | 77,77 | 67,78 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m²-gün)** | | | | | | | | | **72,77** | **77,77** |
| **Katkı Oranları (%)** | | | | | | | | | **34,65%** | **19,94%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m²-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührüsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyla ilgilidir.
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**61.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15210** | 83,87 | 74,70 | 69,35 | 57,80 | 72,88 | 64,34 | 58,85 | 50,87 | 71,43 | 61,74 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **66,58** | **71,43** |
| **Katkı Oranları (%)** | | | | | | | | | **31,71%** | **18,32%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**62.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **150211** | 98,41 | 87,03 | 80,31 | 68,83 | 86,58 | 77,32 | 71,19 | 60,99 | 83,64 | 74,02 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **78,83** | **83,64** |
| **Katkı Oranları (%)** | | | | | | | | | **37,54%** | **21,45%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**63.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15212** | 109,79 | 97,37 | 88,32 | 75,30 | 99,44 | 88,06 | 77,02 | 70,20 | 92,69 | 83,68 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **88,19** | **92,69** |
| **Katkı Oranları (%)** | | | | | | | | | **41,99%** | **23,77%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**64.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15213** | 114,03 | 104,40 | 99,66 | 90,94 | 97,88 | 92,98 | 79,36 | 72,89 | 102,26 | 85,78 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **94,02** | **102,26** |
| **Katkı Oranları (%)** | | | | | | | | | **44,77%** | **26,22%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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**65.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15214** | 97,80 | 84,06 | 77,16 | 71,03 | 88,15 | 77,74 | 63,63 | 58,14 | 82,51 | 71,91 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **77,21** | **82,51** |
| **Katkı Oranları (%)** | | | | | | | | | **36,77%** | **21,16%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

**66.NOKTA**

| 1.AY | | | | | 2.AY | | | | ORTALAMA | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Cihaz No** | **A** | **B** | **C** | **D** | **A** | **B** | **C** | **D** | | |
| **15215** | 102,94 | 94,25 | 89,97 | 82,10 | 88,36 | 83,94 | 71,65 | 65,81 | 92,31 | 77,44 |
| | | | | | | | | | **UVS** | **KVS** |
| **Tesis Etki Alanı Ortalama Çöken Toz (mg/m$^2$-gün)** | | | | | | | | | **84,88** | **92,31** |
| **Katkı Oranları (%)** | | | | | | | | | **40,42%** | **23,67%** |
| **SKHKKY Ek-2. Tablo 2.2. Sınır Değerleri (mg/m$^2$-gün)** | | | | | | | | | **210** | **390** |

### ii. Değerlendirme ve Sonuç

Proje alanı çevresinde gerçekleştirilen hava kalitesi (Çöken Toz) ölçümleri neticesinde elde edilen sonuçlara göre; **çöken toz tayini konsantrasyonları sınır değerlerin altında kalmaktadır.**

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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## C. EKLER

**EK-1 : LABORATUVAR BELGELERİ**

## EK-1 LABORATUVAR BELGELERİ

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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Türk Akreditasyon Kurumu

# AKREDİTASYON SERTİFİKASI

Deney Laboratuvarı olarak faaliyet gösteren,

**BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜHENDİSLİK MÜŞAVİRLİK SANAYİ VE TİCARET LİMİTED ŞİRKETİ**

Merkez Adres: İNÖNÜ MAHALLESİ 1738.SOKAK NO:1/10 YENİMAHALLE Ankara / Türkiye

TÜRKAK tarafından yapılan denetim sonucunda TS EN ISO/IEC 17025:2017 standardına göre Ek'te yer alan kapsamlarda akredite edilmiştir.

**Akreditasyon No : AB-0946-T**

**Akreditasyon Tarihi : 31.10.2015**

**Revizyon Tarihi / No : 27.05.2022 / 08**

Bu Sertifika, yukarıda açık adı ve adresi yazılı Kuruluşun TS EN ISO/IEC 17025:2017 Standardına, ilgili Yönetmelik ve Tebliğlere uygunluğunu sürdürmesi halinde **24.02.2024** tarihine kadar geçerlidir.

Gülden Banu Müderrisoğlu
Genel Sekreter

Türk Akreditasyon Kurumu (TÜRKAK) ISO/IEC 17025 alanında Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile çok taraflı anlaşma (MLA/MRA) imzalamıştır.

Bu rapor yalnızca **KINALI-MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 18-19-20.10.2022 / 17-18-19.11.2022** tarihleri arasında yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşullarıyle ilgilidir.
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Akreditasyon No: AB-0946-T
Revizyon No: 08 Tarih: 27.05.2022

Deney Laboratuvarı

Adresi : İNONU MAHALLESİ 1738 SOKAK NO:1/10 YENİMAHALLE Ankara / Türkiye

Telefon : +90 3122508485
Fax : -
E-Posta : info@batilaboratuvari.com.tr
Web Sitesi :

**İş Hijyeni Ölçüm, Test ve Analizleri**

| Deneyi Yapılan Malzemeler / Ürünler | Deney Adı | Deney Metodu (Ulusal, Uluslararası Standartlar, İşletme-içi Metotlar) |
|---|---|---|
| İş Hijyeni<br>Dedektör Tüple Gaz Ölçümü | Zehirli Gaz veya Buhar Konsantrasyonlarının Tayini<br>(Bu kapsamda talep edilen bileşik isimleri açık olarak yazılacaktır.)<br>Numune Alma ve Ölçüm: Dedektör Tüple Anlık Ölçüm<br>Numune Alma ve Ölçüm: Pompa ve Dedektör Tüple Uzun Vadeli Aktif Ölçüm<br>Numune Alma ve Ölçüm: Dozimetre Tüpü İle Uzun Vadeli Pasif Ölçüm | ASTM D4490-96 |
| İş Hijyeni<br>Toz Ölçümü | Toplam ve Solunabilir Toz Tayini<br>Numune Alma: Pompa ile Filtreye Numune Alma<br>Ölçüm: Gravimetrik Metot | HSE-MDHS 14/3 |
| İş Hijyeni<br>Gürültü | Çalışma Ortamında Maruz Kalınan Gürültünün Ölçülmesi | TS EN ISO 9612 |
| İş Hijyeni<br>Titreşim | Kişilerin Maruz Kaldığı, Elle İletilen Titreşimin Ölçülmesi ve Değerlendirilmesi | TS EN ISO 5349-1<br>TS EN ISO 5349-2 |
| İş Hijyeni<br>Titreşim | Tüm Vücudun Titreşime Maruz Kalmasının Ölçülmesi ve Değerlendirilmesi | TS ISO 2631-1 (TS EN 1032+A1 ile birlikte) |
| İş Hijyeni<br>Titreşim | Hareketli Makinaların Deneye Tabi Tutulması ile Titreşim Emisyon Değerinin Tespiti | TS EN 1032+A1 |
| İş Hijyeni<br>Manyetik Alan | İnsanların Elektrik, Manyetik ve Elektromanyetik Alanlara Maruz Kalmasının Ölçülmesi | TS EN 50413 |
| İş Hijyeni<br>Aydınlatma | İş Yerlerindeki Aydınlatma Işık Şiddeti Düzeyinin Ölçümü | COHSR-928-1-IPG-039 |
| İş Hijyeni<br>Termal Konfor | Orta Dereceli Termal Ortamlar için PMV ve PPD İndislerinin Tayini, Termal Rahatlık İçin Şartların Belirlenmesi | TS EN ISO 7730 |
| İş Hijyeni<br>Termal Konfor | Termal Çevrenin Ergonomisi - WBGT (Islak Ampul Küresel Sıcaklık) Endeksi Kullanılarak Isı Stresinin Değerlendirilmesi | TS EN ISO 7243 |

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Akreditasyon No: AB-0946-T
Revizyon No: 08 Tarih: 27.05.2022

**Çevresel Deneyler**

| Deneyi Yapılan Malzemeler / Ürünler | Deney Adı | Deney Metodu (Ulusal, Uluslararası Standartlar, İşletme-içi Metotlar) |
|---|---|---|
| Baca Gazı | Sabit Kaynak Emisyonları-Bacalarda Gaz Akış Hız ve Debi Tayini<br>Ölçüm: L Tipi Pitot Tüpü<br>Ölçüm: S Tipi Pitot Tüpü | TS ISO 10780 * |
| İmisyon (Çevre Havası) | Askıdaki Tanecikli Maddenin PM10 veya PM 2,5 Kütle Derişimlerinin Tayini<br>Gravimetrik Metot | TS EN 12341 |
| İmisyon (Çevre Havası) | Çöken Toz Tayini<br>Gravimetrik Metot | TS 2342 |
| Akustik-Gürültü | Akustik-Çevre Gürültüsünün Tarifi, Ölçülmesi ve Değerlendirilmesi - Bölüm 1: Temel Büyüklükler ve Değerlendirme İşlemleri | TS ISO 1996-1 |
| Akustik-Gürültü | Akustik-Çevresel Gürültünün Tanımı, Ölçümü ve Değerlendirilmesi - Bölüm 2: Ses Basıncı Seviyelerinin Belirlenmesi | TS ISO 1996-2 |
| Akustik-Gürültü | Gürültü Kaynaklarının Ses Gücü Seviyelerinin ve Ses Enerji Seviyelerinin Ses Basıncı Kullanılarak Belirlenmesi - Yansıtıcı Bir Düzlem Üzerindeki Temel Olarak Serbest Bir Alanda Uygulanan Mühendislik Yöntemleri | TS EN ISO 3744 |
| Akustik-Gürültü | Gürültü Kaynaklarının Ses Gücü Seviyelerinin ve Ses Enerji Seviyelerinin Ses Basıncı Kullanılarak Belirlenmesi - Yansıtıcı Bir Düzlem Üzerinde Çevreleyici Bir Ölçüm Yüzeyinin Kullanıldığı Gözlem Yöntemi | TS EN ISO 3746 |
| Akustik-Gürültü | Çoklu Gürültü Kaynağına Sahip Sanayi Tesislerinde Yapılan Ses Basıncı Düzeyi Ölçümlerinden Ses Gücü Düzeyinin ($\Delta L_1$, $\Delta L_2$, $\Delta L_{12}$, $\Delta L_3$, $L_{p,A}$, $L_w$) Tespiti | TS ISO 8297 |

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| | | |
|---|---|---|
| | | |
| Akustik-Gürültü | Sesin Dışarıda Yayılırken Azalması - Bölüm 1: Sesin Atmosfer Tarafından Soğrulmasının Hesaplanması | TS ISO 9613-1 |
| Akustik-Gürültü | Sesin Dışarıda Yayılırken Azalması - Bölüm 2: Genel Hesaplama Yöntemi | TS ISO 9613-2 |
| Titreşim | Madencilik Faaliyetleri Sonucunda Oluşan Hava Şoku ve Yer Titreşiminin Ölçülmesi (a, v) | TS 10354 |
| Titreşim | Binalarda Titreşimin Ölçülmesi ve Yapı Hasarının Tespiti (ır, a, V) | TS ISO 4866 |
| Titreşim | Hidrolik Güç Kaynakları ve Pompa Tesisatlarındaki Makine Setlerinin Dönmeyen Parçalarında Titreşimin Ölçülmesi ve Değerlendirilmesi ($V_{rms}$) | ISO 10816-5 |

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**İnönü Mahallesi Batı Bulvarı 1738 Sokak No:1/10 Batıkent /ANKARA**

**Tel: 0 312 250 84 85  Fax: 0 312 278 48 86**

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İNÖNÜ MAH. YILDIRIMLAR SAN. SİT. 1738. SOK.
1/10 KAT:6 BATIKENT ANKARA


TÜRKAK
AB-0946-T

# HAVA KALİTESİ ÖLÇÜMLERİ SONUÇ RAPORU

| | |
|---|---|
| ***Müşterinin Adı/Adresi:***<br>Customer Name/Address | **KINALI - MALKARA YÜKSEK HIZLI TREN PROJESİ**<br><br>Kınalı - Malkara |
| ***Müşterinin Telefonu/Faksı:***<br>Customer Phone/Fax | Telefon: - Fax: - |
| ***Talep Numarası:***<br>Order No. | TP-22-138 |
| ***Numunenin Adı ve Tarifi:***<br>Name And Identity Of The Test Item | Hava Kalitesi Ölçümleri |
| ***Ölçümün Yapıldığı Tarih:***<br>Date Of Test | 19-20-21.09.2022/ 22-23-24.09.2022/ 26-27-28.09.2022/ 29-30.09.2022-01.10.2022 |
| ***Raporun Numarası ve Tarihi:***<br>Number And Date Of The Report | R-21-138/1 \| 18.11.2022 |

BATI LABORATUVARI ANKARA

**KASIM 2022**

# BATI LABORATUVARI®

**ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. SAN. VE TİC. LTD. ŞTİ.**
İNÖNÜ MAH. YILDIRIMLAR SAN. SİT. 1738. SOK.
1/10 KAT:6 BATIKENT ANKARA
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E-Mail: info@batilaboratuvari.com.tr

TÜRKAK
Test
TS EN ISO/IEC 17025
AB-0946-T

| |
|---|
| AB-0946-T |
| R-22-138 |
| 11-22 |

**Deney Raporu** / *Test Report*

| | |
|---|---|
| ***Müşterinin Adı/Adresi:*** Customer Name/Address | **KINALI - MALKARA YÜKSEK HIZLI TREN PROJESİ** Kınalı - Malkara |
| ***Müşterinin Telefonu/Faksı:*** Customer Phone/Fax | Telefon: - / Fax: - |
| ***Talep Numarası:*** Order No | TP-22-138 |
| ***Numunenin Adı ve Tarifi:*** Name and İdentity of the Test İtem | Hava Kalitesi Ölçümü |
| ***Numunenin Kabul Tarihi ve Numarası:*** The Date and Number of Receipt of the Test İtem | 03.10.2022 / NK-22-138 |
| ***Açıklamalar:*** Remark | - |
| ***Ölçümün Yapıldığı Tarih:*** Date of Test | 19-20-21.09.2022/ 22-23-24.09.2022/ 26-27-28.09.2022/ 29-30.09.2022-01.10.2022 |
| ***Raporun Sayfa Sayısı:*** Number of Pages of the Report | 26 (Kapak Sayfaları Hariç) |

***Deney Laboratuvarı olarak faaliyet gösteren BATI LABORATUVARI, TÜRKAK'tan AB-0946-T ile TS-EN ISO/IEC 17025 standardına göre akredite edilmiştir.***

*BATI LABORATUVARI accredited by TÜRKAK under registration number AB-0946-T for TS-EN ISO/IEC 17025 as test laboratory.*

***Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.***

*Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) fort he recognition of test reports*

***Deney ve/veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.***

*The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.S*

| ***Tarih/Mühür*** Date/Seal | ***Deneyi Yapan*** Test Done by | ***Raporu Hazırlayan*** Report Prepared by | ***Onay*** Approved by |
|---|---|---|---|
| 18.11.2022 | **B.Barbaros YÜCE** Deney Sorumlusu | **Melek ERCAN** Rapor Sorumlusu | |

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan Hava Kalitesi Ölçümleri için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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## A. GİRİŞ

Bu rapor aşağıda açık adresi belirtilen tesiste gerçekleştirilen hava kalitesi ölçümleri sonucunda hazırlanmıştır.

**Ölçüm Tarihi** : 19-20-21.09.2022/ 22-23-24.09.2022/ 26-27-28.09.2022/ 29-30.09.2022-01.10.2022

**Ölçüm Yeri** : **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ**

**Tesis Adresi** : KINALI -MALKARA

**Tablo 1:** Ölçüm Nokası Bilgileri

| ÖLÇÜM TARİHİ | ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|---|
| 19-20-21.09.2022 | 1.NOKTA | 506304 | 4525649 |
| 19-20-21.09.2022 | 2.NOKTA | 507026 | 4525865 |
| 19-20-21.09.2022 | 3.NOKTA | 512447 | 4524860 |
| 19-20-21.09.2022 | 4.NOKTA | 508327 | 4528503 |
| 19-20-21.09.2022 | 5.NOKTA | 511329 | 4529048 |
| 19-20-21.09.2022 | 6.NOKTA | 512481 | 4527410 |
| 19-20-21.09.2022 | 7.NOKTA | 514647 | 4529428 |
| 19-20-21.09.2022 | 8.NOKTA | 517267 | 4531152 |
| 19-20-21.09.2022 | 9.NOKTA | 518048 | 4529257 |
| 19-20-21.09.2022 | 10.NOKTA | 520889 | 4531560 |
| 19-20-21.09.2022 | 11.NOKTA | 523258 | 4530892 |
| 19-20-21.09.2022 | 12.NOKTA | 523424 | 4532271 |
| 19-20-21.09.2022 | 13.NOKTA | 525104 | 4531792 |
| 19-20-21.09.2022 | 14.NOKTA | 526810 | 4533248 |
| 19-20-21.09.2022 | 15.NOKTA | 527803 | 4532372 |
| 19-20-21.09.2022 | 16.NOKTA | 529586 | 4535472 |
| 19-20-21.09.2022 | 17.NOKTA | 526412 | 4540054 |
| 22-23-24.09.2022 | 18.NOKTA | 529123 | 4539993 |
| 22-23-24.09.2022 | 19.NOKTA | 531279 | 4536789 |
| 22-23-24.09.2022 | 20.NOKTA | 532720 | 4533451 |

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| ÖLÇÜM TARİHİ | ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|---|
| 22-23-24.09.2022 | 21.NOKTA | 531830 | 4540355 |
| 22-23-24.09.2022 | 22.NOKTA | 536037 | 4539504 |
| 22-23-24.09.2022 | 23.NOKTA | 536539 | 4538863 |
| 22-23-24.09.2022 | 24.NOKTA | 537824 | 4539890 |
| 22-23-24.09.2022 | 25.NOKTA | 539411 | 4540869 |
| 22-23-24.09.2022 | 26.NOKTA | 540434 | 4541505 |
| 22-23-24.09.2022 | 27.NOKTA | 540971 | 4541733 |
| 22-23-24.09.2022 | 28.NOKTA | 543152 | 4541306 |
| 22-23-24.09.2022 | 29.NOKTA | 544184 | 4540051 |
| 22-23-24.09.2022 | 30.NOKTA | 544146 | 4541848 |
| 22-23-24.09.2022 | 31.NOKTA | 545253 | 4541473 |
| 22-23-24.09.2022 | 32.NOKTA | 546711 | 4539397 |
| 22-23-24.09.2022 | 33.NOKTA | 548595 | 4539816 |
| 22-23-24.09.2022 | 34.NOKTA | 548702 | 4539432 |
| 26-27-28.09.2022 | 35.NOKTA | 549591 | 4541426 |
| 26-27-28.09.2022 | 36.NOKTA | 550732 | 4538571 |
| 26-27-28.09.2022 | 37.NOKTA | 552631 | 4538392 |
| 26-27-28.09.2022 | 38.NOKTA | 553205 | 4542666 |
| 26-27-28.09.2022 | 39.NOKTA | 552391 | 4544142 |
| 26-27-28.09.2022 | 40.NOKTA | 555979 | 4543689 |
| 26-27-28.09.2022 | 41.NOKTA | 560252 | 4541820 |
| 26-27-28.09.2022 | 42.NOKTA | 562560 | 4548340 |
| 26-27-28.09.2022 | 43.NOKTA | 568345 | 4548605 |
| 26-27-28.09.2022 | 44.NOKTA | 569553 | 4546810 |
| 26-27-28.09.2022 | 45.NOKTA | 570179 | 4544497 |
| 26-27-28.09.2022 | 46.NOKTA | 571561 | 4544339 |
| 26-27-28.09.2022 | 47.NOKTA | 574485 | 4548016 |

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| ÖLÇÜM TARİHİ | ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|---|
| 26-27-28.09.2022 | 48.NOKTA | 575243 | 4549478 |
| 26-27-28.09.2022 | 49.NOKTA | 578865 | 4549326 |
| 26-27-28.09.2022 | 50.NOKTA | 576553 | 4551925 |
| 29-30.09.2022-01.10.2022 | 51.NOKTA | 576083 | 4547951 |
| 29-30.09.2022-01.10.2022 | 52.NOKTA | 580170 | 4547562 |
| 29-30.09.2022-01.10.2022 | 53.NOKTA | 580496 | 4543970 |
| 29-30.09.2022-01.10.2022 | 54.NOKTA | 580800 | 4538257 |
| 29-30.09.2022-01.10.2022 | 55.NOKTA | 584542 | 4543854 |
| 29-30.09.2022-01.10.2022 | 56.NOKTA | 585305 | 4548356 |
| 29-30.09.2022-01.10.2022 | 57.NOKTA | 588165 | 4548686 |
| 29-30.09.2022-01.10.2022 | 58.NOKTA | 586482 | 4550068 |
| 29-30.09.2022-01.10.2022 | 59.NOKTA | 588893 | 4551243 |
| 29-30.09.2022-01.10.2022 | 60.NOKTA | 588814 | 4554537 |
| 29-30.09.2022-01.10.2022 | 61.NOKTA | 590046 | 4559119 |
| 29-30.09.2022-01.10.2022 | 62.NOKTA | 591885 | 4549968 |
| 29-30.09.2022-01.10.2022 | 63.NOKTA | 594479 | 4549787 |
| 29-30.09.2022-01.10.2022 | 64.NOKTA | 596095 | 4549550 |
| 29-30.09.2022-01.10.2022 | 65.NOKTA | 595540 | 4551890 |
| 29-30.09.2022-01.10.2022 | 66.NOKTA | 599081 | 4551537 |

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## B. ÖLÇÜM RAPORLARI

# 1. HAVA KALİTESİ ÖLÇÜM RAPORU

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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## i. Giriş

2872 sayılı Çevre Kanunu'nun ilgili hükümleri gereğince 03.07.2009 tarih ve 27277 sayılı Resmi Gazete'de yayınlanan "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği" ve değişiklik yapılmasına dair yönetmelikler (S.K.H.K.K.Y.), her türlü sanayi ve enerji üretim tesislerinden kaynaklanan hava kirliliği seviyelerine sınırlamalar getirmekte ve bu kirletici kaynakları "Tesis" olarak tanımlayarak çevresindeki hava kirliliğinin ölçüm ve denetimini zorunlu kılmaktadır. Bu yönetmelik gereğince yukarıda verilen tarihler arasında belirlenen noktalarda PM10 ve PM2,5 ölçümleri yapılmış ve "Sanayi Kaynaklı Hava Kirliliğinin Kontrolü Yönetmeliği" esas alınarak bu rapor hazırlanmıştır.

## ii. Ölçüm Metotları

Ölçümler aşağıda verilen standartlar çerçevesinde gerçekleştirilmiştir.

| | |
|---|---|
| **TS EN 12341** | **NATIONAL PRIMARY AND SECONDARY AMBIENT AIR QUALITY STANDARDS** |

## iii. İlgili Yönetmelik Maddeleri

S.K.H.K.K.Y. Ek-2 gereğince, mevcut tesislerin etki alanında Hava Kirlenmesine Katkı Değeri (H.K.K.D.)' nin dağılım modellemesi kullanılarak hesaplanması, tesis etki alanında hava kalitesinin ölçülmesi ve ölçüm metotları aşağıdaki esaslara göre yapılır:

Hava kalitesi ölçümleri kural olarak yer seviyesinden, 1,5 - 4,0 metre arasındaki yüksekliklerde, binadan (veya ekili alandan) en az 1,5 metre yan mesafe tutularak yapılır.

A - Uzun Vadeli Sınır Değerleri (UVS) : Aşılmaması gereken, bütün ölçüm sonuçlarının aritmetik ortalaması olan değerlerdir.

B - Kısa Vadeli Sınır Değerleri (KVS) : Maksimum günlük ortalama değerler veya istatistik olarak bütün ölçüm sonuçları sayısal değerlerinin büyüklüğüne göre dizildiğinde, ölçüm sonuçlarının % 95'ini aşmaması gereken değerlerdir.

Hava kirleticileri (PM 10) için uyulması gereken sınır değerler aşağıda verilmiştir.

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**S.K.H.K.K.Y Tablo 2.2** Tesis Etki Alanında Hava Kalitesi Sınır Değerleri

| Parametre | | Süre | Birimi | YIL | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 2014 | 2015 | 2016 | 2017 | 2018 | 2019-2023 | 2024 ve sonrası |
| $SO_2$ | | Saatlik (Bir Yılda 24 Defadan Fazla Aşılmaz) | $\mu g/m^3$ | 500 | 470 | 440 | 410 | 380 | 350 | 350 |
| | | 24 Saatlik | | 250 | 225 | 200 | 175 | 150 | 125 | 125 |
| | | UVS | | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| | | **Yıllık ve kış dönemi (1 Ekim-31 Mart) | | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| $NO_2$ | | Saatlik (bir yılda 18 defadan fazla aşılmaz) | $\mu g/m^3$ | 300 | 290 | 280 | 270 | 260 | 250 | 200* |
| | | yıllık | | 60 | 56 | 52 | 48 | 44 | 40* | 40 |
| Havada Asılı Partikül Madde (PM 10) | | 24 saatlik (bir yılda 35 defadan fazla aşılmaz) | $\mu g/m^3$ | 100 | 90 | 80 | 70 | 60 | 50 | 50 |
| | | Yıllık | | 60 | 56 | 52 | 48 | 44 | 40 | 40 |
| Pb | | Yıllık | $\mu g/m^3$ | 1 | 0,9 | 0,8 | 0,7 | 0,6 | 0,5 | 0,5 |
| CO | | maksimum günlük 8 saatlik ortalama | $mg/m^3$ | 16 | 14 | 12 | 10 | 10 | 10 | 10 |
| Cd | | UVS | $\mu g/m^3$ | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0,02 |
| HCl | | KVS | $\mu g/m^3$ | 150 | 150 | 150 | 150 | 150 | 150 | 150 |
| | | UVS | | 60 | 60 | 60 | 60 | 60 | 60 | 60 |
| HF | | Saatlik | $\mu g/m^3$ | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| | | KVS | | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| $H_2S$ | | Saatlik | $\mu g/m^3$ | 100 | 100 | 100 | 100 | 100 | 100 | 100 |
| | | KVS | | 20 | 20 | 20 | 20 | 20 | 20 | 20 |
| Toplam Organik Bileşikler (karbon cinsinden) | | Saatlik | $\mu g/m^3$ | 280 | 280 | 280 | 280 | 280 | 280 | 280 |
| | | KVS | | 70 | 70 | 70 | 70 | 70 | 70 | 70 |
| Çöken toz | | KVS | $mg/m^2$gün | 390 | 390 | 390 | 390 | 390 | 390 | 390 |
| | | UVS | | 210 | 210 | 210 | 210 | 210 | 210 | 210 |
| Çöken tozda | Pb ve Bileşikleri | UVS | $mg/m^2$gün | 250 | 250 | 250 | 250 | 250 | 250 | 250 |
| | Cd e Bileşikleri | UVS | | 3,75 | 3,75 | 3,75 | 3,75 | 3,75 | 3,75 | 3,75 |
| | Tl Ve Bileşikleri | UVS | | 5 | 5 | 5 | 5 | 5 | 5 | 5 |

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### iv. Kullanılan Cihazlar, Ölçüm Ve Analiz İşlemi

Tesiste ortam tozu (PM10) ölçümü yapılmıştır. Ölçümlerde MCZ Toz Örnekleme Cihazı kullanılmıştır. Cihaz ortam havasında solunabilir havadaki partikül maddelerin (PM10) örnekleme işleminin gerçekleştirilmesi için tasarlanmıştır. PM10 miktarının tayini TS EN 12341 standardına uygun olarak gerçekleştirilmiştir. Örnekleme işleminde toz filtrede toplanır ve laboratuvar şartlarında gravimetrik olarak tayin edilir. 2,3 $m^3$/sn akış debisi ile cihazlar örnekleme yapabilmektedir. Filtre tutucuda toplanan partikül maddeler, belirli sürenin sonunda cihazdan alınarak laboratuara getirilmektedir. Burada, etüvde kurutulan filtreler terazide tartılarak meydana gelen ağırlık farkı hesaplanmaktadır. Tartımdan elde edilen fark numune alma süresi hesaba katılarak değerlendirilmektedir.

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### v. Ölçüm Sonuçları

Belirlenen lokasyonlarda yapılan ölçümler sonucunda elde edilen günlük değerler aşağıda verilmiştir.

**Tablo 1: Hava Kalitesi (PM10) Ölçüm Sonuçları**

| ÖLÇÜM TARİHİ | ÖLÇÜM NUMARASI | KOORDİNATLAR | | KONSANTRASYON µg /m$^3$ | SKHKKYSINIR DEĞER KVD µg /m$^3$ |
|---|---|---|---|---|---|
| 19.09.2022 | 1.NOKTA | 506304 | 4525649 | 17,1 | 50 |
| 19.09.2022 | 2.NOKTA | 507026 | 4525865 | 25,6 | 50 |
| 19.09.2022 | 3.NOKTA | 512447 | 4524860 | 25,8 | 50 |
| 19.09.2022 | 4.NOKTA | 508327 | 4528503 | 21,5 | 50 |
| 19.09.2022 | 5.NOKTA | 511329 | 4529048 | 20,7 | 50 |
| 20.09.2022 | 6.NOKTA | 512481 | 4527410 | 21,3 | 50 |
| 20.09.2022 | 7.NOKTA | 514647 | 4529428 | 25,4 | 50 |
| 20.09.2022 | 8.NOKTA | 517267 | 4531152 | 19,9 | 50 |
| 20.09.2022 | 9.NOKTA | 518048 | 4529257 | 16,6 | 50 |
| 20.09.2022 | 10.NOKTA | 520889 | 4531560 | 22,3 | 50 |
| 21.09.2022 | 11.NOKTA | 523258 | 4530892 | 16,7 | 50 |
| 21.09.2022 | 12.NOKTA | 523424 | 4532271 | 16,8 | 50 |
| 21.09.2022 | 13.NOKTA | 525104 | 4531792 | 22,1 | 50 |
| 21.09.2022 | 14.NOKTA | 526810 | 4533248 | 22,0 | 50 |
| 21.09.2022 | 15.NOKTA | 527803 | 4532372 | 21,7 | 50 |
| 21.09.2022 | 16.NOKTA | 529586 | 4535472 | 25,1 | 50 |
| 21.09.2022 | 17.NOKTA | 526412 | 4540054 | 21,6 | 50 |
| 22.09.2022 | 18.NOKTA | 529123 | 4539993 | 16,1 | 50 |
| 22.09.2022 | 19.NOKTA | 531279 | 4536789 | 21,8 | 50 |
| 22.09.2022 | 20.NOKTA | 532720 | 4533451 | 24,0 | 50 |

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| ÖLÇÜM TARİHİ | ÖLÇÜM NUMARASI | KOORDİNATLAR | | KONSANTRASYON µg /m$^3$ | SKHKKYSINIR DEĞER KVD µg /m$^3$ |
|---|---|---|---|---|---|
| 22.09.2022 | 21.NOKTA | 531830 | 4540355 | 23,4 | 50 |
| 22.09.2022 | 22.NOKTA | 536037 | 4539504 | 23,2 | 50 |
| 23.09.2022 | 23.NOKTA | 536539 | 4538863 | 17,4 | 50 |
| 23.09.2022 | 24.NOKTA | 537824 | 4539890 | 16,6 | 50 |
| 23.09.2022 | 25.NOKTA | 539411 | 4540869 | 21,8 | 50 |
| 23.09.2022 | 26.NOKTA | 540434 | 4541505 | 23,1 | 50 |
| 23.09.2022 | 27.NOKTA | 540971 | 4541733 | 24,3 | 50 |
| 24.09.2022 | 28.NOKTA | 543152 | 4541306 | 24,1 | 50 |
| 24.09.2022 | 29.NOKTA | 544184 | 4540051 | 23,0 | 50 |
| 24.09.2022 | 30.NOKTA | 544146 | 4541848 | 25,4 | 50 |
| 24.09.2022 | 31.NOKTA | 545253 | 4541473 | 22,6 | 50 |
| 24.09.2022 | 32.NOKTA | 546711 | 4539397 | 16,6 | 50 |
| 24.09.2022 | 33.NOKTA | 548595 | 4539816 | 24,3 | 50 |
| 24.09.2022 | 34.NOKTA | 548702 | 4539432 | 24,9 | 50 |
| 26.09.2022 | 35.NOKTA | 549591 | 4541426 | 24,0 | 50 |
| 26.09.2022 | 36.NOKTA | 550732 | 4538571 | 22,3 | 50 |
| 26.09.2022 | 37.NOKTA | 552631 | 4538392 | 15,8 | 50 |
| 26.09.2022 | 38.NOKTA | 553205 | 4542666 | 25,3 | 50 |
| 26.09.2022 | 39.NOKTA | 552391 | 4544142 | 25,6 | 50 |
| 27.09.2022 | 40.NOKTA | 555979 | 4543689 | 21,8 | 50 |
| 27.09.2022 | 41.NOKTA | 560252 | 4541820 | 16,8 | 50 |
| 27.09.2022 | 42.NOKTA | 562560 | 4548340 | 22,4 | 50 |

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| ÖLÇÜM TARİHİ | ÖLÇÜM NUMARASI | KOORDİNATLAR | | KONSANTRASYON µg /m$^3$ | SKHKKYSINIR DEĞER KVD µg /m$^3$ |
|---|---|---|---|---|---|
| 27.09.2022 | 43.NOKTA | 568345 | 4548605 | 24,0 | 50 |
| 27.09.2022 | 44.NOKTA | 569553 | 4546810 | 24,4 | 50 |
| 28.09.2022 | 45.NOKTA | 570179 | 4544497 | 24,9 | 50 |
| 28.09.2022 | 46.NOKTA | 571561 | 4544339 | 23,1 | 50 |
| 28.09.2022 | 47.NOKTA | 574485 | 4548016 | 20,3 | 50 |
| 28.09.2022 | 48.NOKTA | 575243 | 4549478 | 14,8 | 50 |
| 28.09.2022 | 49.NOKTA | 578865 | 4549326 | 23,8 | 50 |
| 28.09.2022 | 50.NOKTA | 576553 | 4551925 | 23,3 | 50 |
| 30.09.2022 | 51.NOKTA | 576083 | 4547951 | 23,5 | 50 |
| 30.09.2022 | 52.NOKTA | 580170 | 4547562 | 19,5 | 50 |
| 30.09.2022 | 53.NOKTA | 580496 | 4543970 | 18,9 | 50 |
| 30.09.2022 | 54.NOKTA | 580800 | 4538257 | 15,1 | 50 |
| 30.09.2022 | 55.NOKTA | 584542 | 4543854 | 20,0 | 50 |
| 30.09.2022 | 56.NOKTA | 585305 | 4548356 | 19,9 | 50 |
| 30.09.2022 | 57.NOKTA | 588165 | 4548686 | 15,1 | 50 |
| 01.10.2022 | 58.NOKTA | 586482 | 4550068 | 22,1 | 50 |
| 01.10.2022 | 59.NOKTA | 588893 | 4551243 | 21,0 | 50 |
| 01.10.2022 | 60.NOKTA | 588814 | 4554537 | 13,5 | 50 |
| 01.10.2022 | 61.NOKTA | 590046 | 4559119 | 15,3 | 50 |
| 01.10.2022 | 62.NOKTA | 591885 | 4549968 | 23,5 | 50 |
| 01.10.2022 | 63.NOKTA | 594479 | 4549787 | 19,4 | 50 |
| 01.10.2022 | 64.NOKTA | 596095 | 4549550 | 21,3 | 50 |

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|---|---|---|---|---|---|
| 01.10.2022 | 65.NOKTA | 595540 | 4551890 | 14,4 | 50 |
| 01.10.2022 | 66.NOKTA | 599081 | 4551537 | 20,4 | 50 |

**vi. Değerlendirme ve Sonuç**

Proje alanı çevresinde gerçekleştirilen hava kalitesi (PM10) ölçümleri neticesinde elde edilen sonuçlara göre; Havada Asılı Partikül Madde (PM10) konsantrasyonları sınır değerlerin altında kalmaktadır.

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**Tablo 2: Hava Kalitesi (PM 2,5) Ölçüm Sonuçları**

| ÖLÇÜM TARİHİ | ÖLÇÜM NUMARASI | KOORDİNATLAR | | KONSANTRASYON µg /m$^3$ | SKHKKYSINIR DEĞER KVD µg /m$^3$ |
|---|---|---|---|---|---|
| 19.09.2022 | 1.NOKTA | 506304 | 4525649 | 9,4 | - |
| 19.09.2022 | 2.NOKTA | 507026 | 4525865 | 10,5 | - |
| 19.09.2022 | 3.NOKTA | 512447 | 4524860 | 10,2 | - |
| 19.09.2022 | 4.NOKTA | 508327 | 4528503 | 12,3 | - |
| 19.09.2022 | 5.NOKTA | 511329 | 4529048 | 6,9 | - |
| 20.09.2022 | 6.NOKTA | 512481 | 4527410 | 4,2 | - |
| 20.09.2022 | 7.NOKTA | 514647 | 4529428 | 10,4 | - |
| 20.09.2022 | 8.NOKTA | 517267 | 4531152 | 5,9 | - |
| 20.09.2022 | 9.NOKTA | 518048 | 4529257 | 9,7 | - |
| 20.09.2022 | 10.NOKTA | 520889 | 4531560 | 8,3 | - |
| 21.09.2022 | 11.NOKTA | 523258 | 4530892 | 9,4 | - |
| 21.09.2022 | 12.NOKTA | 523424 | 4532271 | 8,8 | - |
| 21.09.2022 | 13.NOKTA | 525104 | 4531792 | 9,1 | - |
| 21.09.2022 | 14.NOKTA | 526810 | 4533248 | 9,1 | - |
| 21.09.2022 | 15.NOKTA | 527803 | 4532372 | 10,1 | - |
| 21.09.2022 | 16.NOKTA | 529586 | 4535472 | 9,5 | - |
| 21.09.2022 | 17.NOKTA | 526412 | 4540054 | 11,9 | - |
| 22.09.2022 | 18.NOKTA | 529123 | 4539993 | 9,7 | - |
| 22.09.2022 | 19.NOKTA | 531279 | 4536789 | 9,4 | - |
| 22.09.2022 | 20.NOKTA | 532720 | 4533451 | 10,5 | - |
| 22.09.2022 | 21.NOKTA | 531830 | 4540355 | 10,2 | - |

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| ÖLÇÜM TARİHİ | ÖLÇÜM NUMARASI | KOORDİNATLAR | | KONSANTRASYON µg /m$^3$ | SKHKKYSINIR DEĞER KVD µg /m$^3$ |
|---|---|---|---|---|---|
| 22.09.2022 | 22.NOKTA | 536037 | 4539504 | 10,8 | - |
| 23.09.2022 | 23.NOKTA | 536539 | 4538863 | 11,2 | - |
| 23.09.2022 | 24.NOKTA | 537824 | 4539890 | 12,3 | - |
| 23.09.2022 | 25.NOKTA | 539411 | 4540869 | 10,3 | - |
| 23.09.2022 | 26.NOKTA | 540434 | 4541505 | 8,9 | - |
| 23.09.2022 | 27.NOKTA | 540971 | 4541733 | 10,5 | - |
| 24.09.2022 | 28.NOKTA | 543152 | 4541306 | 8,1 | - |
| 24.09.2022 | 29.NOKTA | 544184 | 4540051 | 7,4 | - |
| 24.09.2022 | 30.NOKTA | 544146 | 4541848 | 9,9 | - |
| 24.09.2022 | 31.NOKTA | 545253 | 4541473 | 9,7 | - |
| 24.09.2022 | 32.NOKTA | 546711 | 4539397 | 11,2 | - |
| 24.09.2022 | 33.NOKTA | 548595 | 4539816 | 8,6 | - |
| 24.09.2022 | 34.NOKTA | 548702 | 4539432 | 10,3 | - |
| 26.09.2022 | 35.NOKTA | 549591 | 4541426 | 12,5 | - |
| 26.09.2022 | 36.NOKTA | 550732 | 4538571 | 13,3 | - |
| 26.09.2022 | 37.NOKTA | 552631 | 4538392 | 12,0 | - |
| 26.09.2022 | 38.NOKTA | 553205 | 4542666 | 11,4 | - |
| 26.09.2022 | 39.NOKTA | 552391 | 4544142 | 9,2 | - |
| 27.09.2022 | 40.NOKTA | 555979 | 4543689 | 11,1 | - |
| 27.09.2022 | 41.NOKTA | 560252 | 4541820 | 9,4 | - |
| 27.09.2022 | 42.NOKTA | 562560 | 4548340 | 10,8 | - |
| 27.09.2022 | 43.NOKTA | 568345 | 4548605 | 11,6 | - |

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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|---|---|---|---|---|---|
| 27.09.2022 | 44.NOKTA | 569553 | 4546810 | 12,4 | - |
| 28.09.2022 | 45.NOKTA | 570179 | 4544497 | 11,8 | - |
| 28.09.2022 | 46.NOKTA | 571561 | 4544339 | 9,7 | - |
| 28.09.2022 | 47.NOKTA | 574485 | 4548016 | 12,9 | - |
| 28.09.2022 | 48.NOKTA | 575243 | 4549478 | 11,0 | - |
| 28.09.2022 | 49.NOKTA | 578865 | 4549326 | 10,4 | - |
| 28.09.2022 | 50.NOKTA | 576553 | 4551925 | 10,6 | - |
| 30.09.2022 | 51.NOKTA | 576083 | 4547951 | 7,5 | - |
| 30.09.2022 | 52.NOKTA | 580170 | 4547562 | 8,5 | - |
| 30.09.2022 | 53.NOKTA | 580496 | 4543970 | 9,3 | - |
| 30.09.2022 | 54.NOKTA | 580800 | 4538257 | 7,9 | - |
| 30.09.2022 | 55.NOKTA | 584542 | 4543854 | 7,8 | - |
| 30.09.2022 | 56.NOKTA | 585305 | 4548356 | 9,0 | - |
| 30.09.2022 | 57.NOKTA | 588165 | 4548686 | 10,0 | - |
| 01.10.2022 | 58.NOKTA | 586482 | 4550068 | 9,0 | - |
| 01.10.2022 | 59.NOKTA | 588893 | 4551243 | 8,5 | - |
| 01.10.2022 | 60.NOKTA | 588814 | 4554537 | 9,0 | - |
| 01.10.2022 | 61.NOKTA | 590046 | 4559119 | 8,3 | - |
| 01.10.2022 | 62.NOKTA | 591885 | 4549968 | 7,3 | - |
| 01.10.2022 | 63.NOKTA | 594479 | 4549787 | 7,6 | - |
| 01.10.2022 | 64.NOKTA | 596095 | 4549550 | 6,2 | - |
| 01.10.2022 | 65.NOKTA | 595540 | 4551890 | 7,5 | - |

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|---|---|---|---|---|---|
| 01.10.2022 | 66.NOKTA | 599081 | 4551537 | 10,3 | - |

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## C. EKLER

**EK-1 : LABORATUVAR BELGELERİ**

**EK-2 : ÖLÇÜM CİHAZINA AİT BELGELER**

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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## EK-1 LABORATUVAR BELGELERİ

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Türk Akreditasyon Kurumu

# AKREDİTASYON SERTİFİKASI

Deney Laboratuvarı olarak faaliyet gösteren,

**BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜHENDİSLİK MÜŞAVİRLİK SANAYİ VE TİCARET LİMİTED ŞİRKETİ**

Merkez Adres: İNÖNÜ MAHALLESİ 1738.SOKAK NO:1/10 YENİMAHALLE Ankara / Türkiye

TÜRKAK tarafından yapılan denetim sonucunda TS EN ISO/IEC 17025:2017 standardına göre Ek'te yer alan kapsamlarda akredite edilmiştir.

**Akreditasyon No : AB-0946-T**

**Akreditasyon Tarihi : 31.10.2015**

**Revizyon Tarihi / No : 27.05.2022 / 08**

Bu Sertifika, yukarıda açık adı ve adresi yazılı Kuruluşun TS EN ISO/IEC 17025:2017 Standardına, ilgili Yönetmelik ve Tebliğlere uygunluğunu sürdürmesi halinde **24.02.2024** tarihine kadar geçerlidir.

Gülden Banu Müderrisoğlu
Genel Sekreter

Türk Akreditasyon Kurumu (TÜRKAK) ISO/IEC 17025 alanında Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile çok taraflı anlaşma (MLA/MRA) imzalamıştır.

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**'nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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Akreditasyon No: AB-0946-T
Revizyon No: 08 Tarih: 27.05.2022

Deney Laboratuvarı

Adresi : İNONU MAHALLESİ 1738 SOKAK NO:1/10 YENİMAHALLE Ankara / Türkiye

Telefon : +90 3122508485
Fax : -
E-Posta : info@batilaboratuvari.com.tr
Web Sitesi :

İş Hijyeni Ölçüm, Test ve Analizleri

| Deneyi Yapılan Malzemeler / Ürünler | Deney Adı | Deney Metodu (Ulusal, Uluslararası Standartlar, İşletme-içi Metotlar) |
|---|---|---|
| İş Hijyeni<br>Dedektör Tüple Gaz Ölçümü | Zehirli Gaz veya Buhar Konsantrasyonlarının Tayini<br>(Bu kapsamda talep edilen bileşik isimleri açık olarak yazılacaktır.)<br>Numune Alma ve Ölçüm: Dedektör Tüple Anlık Ölçüm<br>Numune Alma ve Ölçüm: Pompa ve Dedektör Tüple Uzun Vadeli Aktif Ölçüm<br>Numune Alma ve Ölçüm: Dozimetre Tüpü İle Uzun Vadeli Pasif Ölçüm | ASTM D4490-96 |
| İş Hijyeni<br>Toz Ölçümü | Toplam ve Solunabilir Toz Tayini<br>Numune Alma: Pompa ile Filtreye Numune Alma<br>Ölçüm: Gravimetrik Metot | HSE-MDHS 14/3 |
| İş Hijyeni<br>Gürültü | Çalışma Ortamında Maruz Kalınan Gürültünün Ölçülmesi | TS EN ISO 9612 |
| İş Hijyeni<br>Titreşim | Kişilerin Maruz Kaldığı, Elle İletilen Titreşimin Ölçülmesi ve Değerlendirilmesi | TS EN ISO 5349-1<br>TS EN ISO 5349-2 |
| İş Hijyeni<br>Titreşim | Tüm Vücudun Titreşime Maruz Kalmasının Ölçülmesi ve Değerlendirilmesi | TS ISO 2631-1 (TS EN 1032+A1 ile birlikte) |
| İş Hijyeni<br>Titreşim | Hareketli Makinaların Deneye Tabi Tutulması ile Titreşim Emisyon Değerinin Tespiti | TS EN 1032+A1 |
| İş Hijyeni<br>Manyetik Alan | İnsanların Elektrik, Manyetik ve Elektromanyetik Alanlara Maruz Kalmasının Ölçülmesi | TS EN 50413 |
| İş Hijyeni<br>Aydınlatma | İş Yerlerindeki Aydınlatma Işık Şiddeti Düzeyinin Ölçümü | COHSR-928-1-IPG-039 |
| İş Hijyeni<br>Termal Konfor | Orta Dereceli Termal Ortamlar için PMV ve PPD İndislerinin Tayini, Termal Rahatlık İçin Şartların Belirlenmesi | TS EN ISO 7730 |
| İş Hijyeni<br>Termal Konfor | Termal Çevrenin Ergonomisi - WBGT (Islak Ampul Küresel Sıcaklık) Endeksi Kullanılarak Isı Stresinin Değerlendirilmesi | TS EN ISO 7243 |

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Akreditasyon No: AB-0946-T
Revizyon No: 08 Tarih: 27.05.2022

**Çevresel Deneyler**

| Deneyi Yapılan Malzemeler / Ürünler | Deney Adı | Deney Metodu (Ulusal, Uluslararası Standartlar, İşletme-içi Metotlar) |
|---|---|---|
| Baca Gazı | Sabit Kaynak Emisyonları-Bacalarda Gaz Akış Hız ve Debi Tayini<br>Ölçüm: L Tipi Pitot Tüpü<br>Ölçüm: S Tipi Pitot Tüpü | TS ISO 10780 * |
| İmisyon (Çevre Havası) | Askıdaki Tanecikli Maddenin PM10 veya PM 2,5 Kütle Derişimlerinin Tayini<br>Gravimetrik Metot | TS EN 12341 |
| İmisyon (Çevre Havası) | Çöken Toz Tayini<br>Gravimetrik Metot | TS 2342 |
| Akustik-Gürültü | Akustik-Çevre Gürültüsünün Tarifi, Ölçülmesi ve Değerlendirilmesi - Bölüm 1: Temel Büyüklükler ve Değerlendirme İşlemleri | TS ISO 1996-1 |
| Akustik-Gürültü | Akustik-Çevresel Gürültünün Tanımı, Ölçümü ve Değerlendirilmesi - Bölüm 2: Ses Basıncı Seviyelerinin Belirlenmesi | TS ISO 1996-2 |
| Akustik-Gürültü | Gürültü Kaynaklarının Ses Gücü Seviyelerinin ve Ses Enerji Seviyelerinin Ses Basıncı Kullanılarak Belirlenmesi - Yansıtıcı Bir Düzlem Üzerindeki Temel Olarak Serbest Bir Alanda Uygulanan Mühendislik Yöntemleri | TS EN ISO 3744 |
| Akustik-Gürültü | Gürültü Kaynaklarının Ses Gücü Seviyelerinin ve Ses Enerji Seviyelerinin Ses Basıncı Kullanılarak Belirlenmesi - Yansıtıcı Bir Düzlem Üzerinde Çevreleyici Bir Ölçüm Yüzeyinin Kullanıldığı Gözlem Yöntemi | TS EN ISO 3746 |
| Akustik-Gürültü | Çoklu Gürültü Kaynağına Sahip Sanayi Tesislerinde Yapılan Ses Basıncı Düzeyi Ölçümlerinden Ses Gücü Düzeyinin ($\Delta L_1$, $\Delta L_t$, $\Delta L_{t1}$, $\Delta L_{t2}$, $L_{pA}$, $L_w$) Tespiti | TS ISO 8297 |

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| | | |
|---|---|---|
| | | |
| Akustik-Gürültü | Sesin Dışarıda Yayılırken Azalması - Bölüm 1: Sesin Atmosfer Tarafından Soğrulmasının Hesaplanması | TS ISO 9613-1 |
| Akustik-Gürültü | Sesin Dışarıda Yayılırken Azalması - Bölüm 2: Genel Hesaplama Yöntemi | TS ISO 9613-2 |
| Titreşim | Madencilik Faaliyetleri Sonucunda Oluşan Hava Şoku ve Yer Titreşiminin Ölçülmesi (a, v) | TS 10354 |
| Titreşim | Binalarda Titreşimin Ölçülmesi ve Yapı Hasarının Tespiti (tr, a, V) | TS ISO 4866 |
| Titreşim | Hidrolik Güç Kaynakları ve Pompa Tesisatlarındaki Makine Setlerinin Dönmeyen Parçalarında Titreşimin Ölçülmesi ve Değerlendirilmesi ($V_{rms}$) | ISO 10816-5 |

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Hava Kalitesi Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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## EK-2 ÖLÇÜM CİHAZINA AİT BELGELER

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|---|
| 212254 |
| 10-21 |

**KALİBRASYON SERTİFİKASI**
*Calibration Certificate*

| | | |
|---|---|---|
| **Cihazın Sahibi** *Customer Name* | : | BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. MÜŞ. SAN. TİC. LTD. ŞTİ. İnönü Mh. Yıldırımlar San. Sit. 1738 Sk. 1/10 Batıkent / ANKARA |
| **İstek Numarası** *Order No.* | : | T-1021-064 |
| **Makine / Cihaz** *Instrument / Device* | : | PM10 Toz Örnekleme Cihazı - Akış Ölçer *PM10 Dust Sampling Device - Flow Meter* |
| **İmalatçı** *Manufacturer* | : | MCZ |
| **Tip** *Type* | : | µPNS-LVS1 |
| **Seri Numarası** *Serial number* | : | 1710-210 |
| **Kalibrasyon Tarihi** *Date of calibration* | : | 22.10.2021 |
| **Sertifika Sayfa Sayısı** *Number of pages* | : | 4 |

Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.
*This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).*
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*The Turkish Accreditation Acency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognition of test reports.*
Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.
*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

| Mühür / Kaşe *Seal* | Yayım Tarihi *Publication Date* | Kalibrasyonu Yapan *Calibrated By* | Onaylayan / Tarih *Approval / Date* |
|---|---|---|---|
| AVL Kalibrasyon | 22.10.2021 | Mehmet GÜVENDİ<br>Kalibrasyon Personeli<br>*Calibration Responsible*<br>e-imzalıdır | Younes NEVAYESHİRAZİ / 22.10.2021<br>Laboratuvar Müdürü<br>*Laboratory Manager*<br>e-imzalıdır |

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| 10-21 |

**1. Cihaza Ait Bilgiler**
*Device to be Calibrated*

| | | |
|---|---|---|
| **Cihazın Adı** *Name of the Instrument* | : | PM10 Toz Örnekleme Cihazı - Akış Ölçer *PM10 Dust Sampling Device - Flow Meter* |
| **İmalatçısı** *Manufacturer* | : | MCZ |
| **Seri Numarası** *Serial Number* | : | 1710-210 |
| **Bölüntüsü** *Scale Division* | : | 0,1 |
| **Tipi** *Type* | : | µPNS-LVS1 |

**2. Cihazın Laboratuvara Kabul Tarihi** *Date of Receipt of Device* : 21.10.2021

**3. Kalibrasyon Metodu**
*Calibration Method*
Test cihazının kalibrasyonu PR.LBBR.201 prosedürüne uygun olarak karşılaştırma metodu ile gerçekleştirilmiştir.

**4. Çevresel Şartlar**
*Environmental Conditions*

| | | | |
|---|---|---|---|
| **Ortam Sıcaklığı** *Ambient Temperature* | : | (22,1 ± 3) | °C |
| **Bağıl Nem** *Relative Humidity* | : | (35 ± 25) | % |
| **Ortam Basıncı** *Ambient Pressure* | : | (918 ± 1) | mbar |

**5. Kalibrasyonda Kullanılan Referans Cihazlar**
*Reference Equipments Used During Calibration*

| Cihaz *Device* | İmalatçı *Manufacturer* | Seri No *Serial No* | Sertifika No *Certificate No* | İzlenebilirlik *Traceability* |
|---|---|---|---|---|
| Akış Kalibratörü | Sierra | 132548 | G2AG-0028 | UME |
| Göstergeli Basınç Sensörü | Verth / Trafag | 14044035 / 409201-003 | 2044839 | UMS |
| Göstergeli Basınç Sensörü | Verth / Trafag | 14044036 / 409201-004 | 2044838 | UMS |
| Göstergeli Sıcaklık Ölçer | Sper Scientific | 100904222 / T1 | 195492 | AVL |
| Göstergeli Sıcaklık Ölçer | Sper Scientific | 100904222 / T2 | 195491 | AVL |
| Sıcaklık ve Nem Ölçer | Extech | 12081741 | 206884 | AVL |

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| 10-21 |

**KALİBRASYON SERTİFİKASI**
*Calibration Certificate*

| | | |
|---|---|---|
| **Cihazın Sahibi** *Customer Name* | : | BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. MÜŞ. SAN. TİC. LTD. ŞTİ. İnönü Mh. Yıldırımlar San. Sit. 1738 Sk. 1/10 Batıkent / ANKARA |
| **İstek Numarası** *Order No.* | : | T-1021-064 |
| **Makine / Cihaz** *Instrument / Device* | : | PM10 Toz Örnekleme Cihazı - Akış Ölçer *PM10 Dust Sampling Device - Flow Meter* |
| **İmalatçı** *Manufacturer* | : | MCZ |
| **Tip** *Type* | : | µPNS-LVS1 |
| **Seri Numarası** *Serial number* | : | 1412-007 |
| **Kalibrasyon Tarihi** *Date of calibration* | : | 22.10.2021 |
| **Sertifika Sayfa Sayısı** *Number of pages* | : | 4 |

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*This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).*
Kalibrasyon laboratuvarı olarak faaliyet gösteren AVL Kalibrasyon Laboratuvarı, TÜRKAK'tan AB-0089-K deneme numarası ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.
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*The Turkish Accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognition of test reports.*
Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.
*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

| Mühür / Kaşe *Seal* | Yayım Tarihi *Publication Date* | Kalibrasyonu Yapan *Calibrated By* | Onaylayan / Tarih *Approval / Date* |
|---|---|---|---|
| AVL Kalibrasyon | 22.10.2021 | Mehmet GÜVENDİ<br>Kalibrasyon Personeli<br>*Calibration Responsible*<br>e-imzalıdır | Younes NEVAYESHİRAZİ / 22.10.2021<br>Laboratuvar Müdürü<br>*Laboratory Manager*<br>e-imzalıdır |

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**1. Cihaza Ait Bilgiler**
*Device to be Calibrated*

| | | |
|---|---|---|
| **Cihazın Adı** *Name of the Instrument* | : | PM10 Toz Örnekleme Cihazı - Akış Ölçer *PM10 Dust Sampling Device - Flow Meter* |
| **İmalatçısı** *Manufacturer* | : | MCZ |
| **Seri Numarası** *Serial Number* | : | 1412-007 |
| **Bölüntüsü** *Scale Division* | : | 0,1 |
| **Tipi** *Type* | : | µPNS-LVS1 |

**2. Cihazın Laboratuvara Kabul Tarihi** *Date of Receipt of Device* : 21.10.2021

**3. Kalibrasyon Metodu**
*Calibration Method*
Test cihazının kalibrasyonu PR.LBBR.201 prosedürüne uygun olarak karşılaştırma metodu ile gerçekleştirilmiştir.

**4. Çevresel Şartlar**
*Environmental Conditions*

| | | | |
|---|---|---|---|
| **Ortam Sıcaklığı** *Ambient Temperature* | : | (22,1 ± 3) | °C |
| **Bağıl Nem** *Relative Humidity* | : | (35 ± 25) | % |
| **Ortam Basıncı** *Ambient Pressure* | : | (918 ± 1) | mbar |

**5. Kalibrasyonda Kullanılan Referans Cihazlar**
*Reference Equipments Used During Calibration*

| Cihaz *Device* | İmalatçı *Manufacturer* | Seri No *Serial No* | Sertifika No *Certificate No* | İzlenebilirlik *Traceability* |
|---|---|---|---|---|
| Akış Kalibratörü | Sierra | 132548 | G2AG-0028 | UME |
| Göstergeli Basınç Sensörü | Verth / Trafag | 14044035 / 409201-003 | 2044839 | UMS |
| Göstergeli Basınç Sensörü | Verth / Trafag | 14044036 / 409201-004 | 2044838 | UMS |
| Göstergeli Sıcaklık Ölçer | Sper Scientific | 100904222 / T1 | 195492 | AVL |
| Göstergeli Sıcaklık Ölçer | Sper Scientific | 100904222 / T2 | 195491 | AVL |
| Sıcaklık ve Nem Ölçer | Extech | 12081741 | 206884 | AVL |

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1/10 KAT:6 BATIKENT ANKARA


TÜRKAK
AB-0946-T

# GÜRÜLTÜ VE TİTREŞİM ÖLÇÜMLERİ SONUÇ RAPORU

| | |
|---|---|
| ***Müşterinin Adı/Adresi:***<br>Customer Name/Address | **KINALI - MALKARA YÜKSEK HIZLI TREN PROJESİ**<br><br>Kınalı - Malkara |
| ***Müşterinin Telefonu/Faksı:***<br>Customer Phone/Fax | Telefon: - Fax: - |
| ***Talep Numarası:***<br>Order No. | TP-22-138 |
| ***Numunenin Adı ve Tarifi:***<br>Name And Identity Of The Test Item | Gürültü ve Titreşim Ölçümleri |
| ***Ölçümün Yapıldığı Tarih:***<br>Date Of Test | 19-20-21.09.2022/ 22-23-24.09.2022/ 26-27-28.09.2022/ 29-30.09.2022-01.10.2022 |
| ***Raporun Numarası ve Tarihi:***<br>Number And Date Of The Report | R-21-138/1 \| 18.11.2022 |

BATI LABORATUVARI ANKARA

**KASIM 2022**

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**SAN. VE TİC. LTD. ŞTİ.**
**İNÖNÜ MAH. YILDIRIMLAR SAN. SİT. 1738. SOK.**
**1/10 KAT:6 BATIKENT ANKARA**
**Tel: 0312 250 84 85, Fax:0312 278 48 86**
**E-Mail:** info@batilaboratuvari.com.tr

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Test
TS EN ISO/IEC 17025
AB-0946-T

| |
|---|
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| 11-22 |

**Deney Raporu** / *Test Report*

| | |
|---|---|
| ***Müşterinin Adı/Adresi:*** Customer Name/Address | **KINALI - MALKARA YÜKSEK HIZLI TREN PROJESİ** Kınalı - Malkara |
| ***Müşterinin Telefonu/Faksı:*** Customer Phone/Fax | Telefon: - / Fax: - |
| ***Talep Numarası:*** Order No. | TP-22-138 |
| ***Numunenin Adı ve Tarifi:*** Name and İdentity of the Test İtem | Gürültü ve Titreşim Ölçümleri |
| ***Numunenin Kabul Tarihi ve Numarası:*** The Date and Number of Receipt of the Test İtem | 03.10.2022 / NK-22-138 |
| ***Açıklamalar:*** Remark | - |
| ***Ölçümün Yapıldığı Tarih:*** Date of Test | 19-20-21.09.2022/ 22-23-24.09.2022/ 26-27-28.09.2022/ 29-30.09.2022-01.10.2022 |
| ***Raporun Sayfa Sayısı:*** Number of Pages of the Report | 190 (Kapak Sayfaları Hariç) |

***Deney Laboratuvarı olarak faaliyet gösteren BATI LABORATUVARI, TÜRKAK'tan AB-0946-T ile TS-EN ISO/IEC 17025 standardına göre akredite edilmiştir.***

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***Deney ve/veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.***

*The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.S*

| ***Tarih/Mühür*** Date/Seal | ***Deneyi Yapan*** Test Done by | ***Raporu Hazırlayan*** Report Prepared by | ***Onay*** Approved by |
|---|---|---|---|
| **18.11.2022** | **B.Barbaros YÜCE** Deney Sorumlusu | **Melek ERCAN** Rapor Sorumlusu | |

Bu rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti.**'nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

Rapor No: R-22-138/1

**İÇİNDEKİLER** **Sayfa No**

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**EK-1 AKREDİTASYON BELGESİ**

**EK-2 ÖLÇÜM CİHAZINA AİT BELGELER**

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm esnasındaki işletme koşulları ile ilgilidir.
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## A. GİRİŞ

Bu rapor aşağıda açık adresi belirtilen tesiste gerçekleştirilen gürültü ölçümleri sonucunda hazırlanmıştır.

| | | |
|---|---|---|
| **Ölçüm Tarihi** | : | 19-20-21.09.2022/ 22-23-24.09.2022/ 26-27-28.09.2022/ 29-30.09.2022-01.10.2022 |
| **Ölçüm Yeri** | : | **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** |
| **Tesis Adresi** | : | KINALI -MALKARA |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm esnasındaki işletme koşulları ile ilgilidir.
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## B. ÖLÇÜM RAPORLARI

# 1. Gürültü Ölçüm Sonuç Raporu

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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## i ÖLÇÜM RAPORLARI

### 1. Kullanılan Cihazlar

Gürültü ölçümlerinde Cesva SC310 Tip 1 Model gürültü ölçüm cihazı ve Cesva CB006 Tip 1 gürültü kalibratörü kullanılmıştır.

## ii ÖLÇÜM METOTLARI

Ölçümler aşağıda verilen standartlar çerçevesinde gerçekleştirilmiştir.

| Parametre | Test / Analiz Metodunun Adı | Deney Metodu ve Kabul Tarihi |
|---|---|---|
| Gürültü Ölçümü | Akustik-Çevre Gürültüsünün Tarifi Ölçülmesi ve Değerlendirilmesi – Bölüm 2: Çevre Gürültü Seviyelerinin Tayini | TS ISO 1996-2:26.03.2009<br>TS ISO 1996-2 / T1:29.06.2009 |

## iii ÖLÇÜM SONUÇLARI VE LOKASYONLAR

Belirlenen 66 ayrı ölçüm istasyonunda yapılan ölçümler sonucunda elde edilen günlük değerler aşağıdaki tablolarda verilmiştir.

**Tablo 1:** Gürültü Ölçüm Noktaları

| ÖLÇÜM TARİHİ | ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|---|
| 19-20-21.09.2022 | 1.NOKTA | 506305 | 4525655 |
| 19-20-21.09.2022 | 2.NOKTA | 507031 | 4525866 |
| 19-20-21.09.2022 | 3.NOKTA | 512427 | 4524843 |
| 19-20-21.09.2022 | 4.NOKTA | 508330 | 4528503 |
| 19-20-21.09.2022 | 5.NOKTA | 511338 | 4529049 |
| 19-20-21.09.2022 | 6.NOKTA | 512467 | 4527409 |
| 19-20-21.09.2022 | 7.NOKTA | 514646 | 4529426 |
| 19-20-21.09.2022 | 8.NOKTA | 517259 | 4531150 |
| 19-20-21.09.2022 | 9.NOKTA | 518051 | 4529260 |
| 19-20-21.09.2022 | 10.NOKTA | 520917 | 4531575 |
| 19-20-21.09.2022 | 11.NOKTA | 523263 | 4530892 |
| 19-20-21.09.2022 | 12.NOKTA | 523420 | 4532270 |
| 19-20-21.09.2022 | 13.NOKTA | 525119 | 4531796 |
| 19-20-21.09.2022 | 14.NOKTA | 526797 | 4533237 |
| 19-20-21.09.2022 | 15.NOKTA | 527788 | 4532359 |

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| | | | |
|---|---|---|---|
| 19-20-21.09.2022 | 16.NOKTA | 529595 | 4535479 |
| **ÖLÇÜM TARİHİ** | **ÖLÇÜM NOKTASI NUMARASI** | **LOKASYON BİLGİSİ** | |
| 19-20-21.09.2022 | 17.NOKTA | 526415 | 4540060 |
| 22-23-24.09.2022 | 18.NOKTA | 529124 | 4539988 |
| 22-23-24.09.2022 | 19.NOKTA | 531283 | 4536793 |
| 22-23-24.09.2022 | 20.NOKTA | 532721 | 4533447 |
| 22-23-24.09.2022 | 21.NOKTA | 531835 | 4540360 |
| 22-23-24.09.2022 | 22.NOKTA | 536037 | 4539511 |
| 22-23-24.09.2022 | 23.NOKTA | 536542 | 4538859 |
| 22-23-24.09.2022 | 24.NOKTA | 537822 | 4539890 |
| 22-23-24.09.2022 | 25.NOKTA | 539409 | 4540872 |
| 22-23-24.09.2022 | 26.NOKTA | 540433 | 4541503 |
| 22-23-24.09.2022 | 27.NOKTA | 540972 | 4541731 |
| 22-23-24.09.2022 | 28.NOKTA | 543153 | 4541309 |
| 22-23-24.09.2022 | 29.NOKTA | 544195 | 4540054 |
| 22-23-24.09.2022 | 30.NOKTA | 544143 | 4541845 |
| 22-23-24.09.2022 | 31.NOKTA | 545250 | 4541470 |
| 22-23-24.09.2022 | 32.NOKTA | 546710 | 4539397 |
| 22-23-24.09.2022 | 33.NOKTA | 548594 | 4539813 |
| 22-23-24.09.2022 | 34.NOKTA | 548702 | 4539430 |
| 26-27-28.09.2022 | 35.NOKTA | 549590 | 4541426 |
| 26-27-28.09.2022 | 36.NOKTA | 550732 | 4538585 |
| 26-27-28.09.2022 | 37.NOKTA | 552634 | 4538395 |
| 26-27-28.09.2022 | 38.NOKTA | 553205 | 4542665 |
| 26-27-28.09.2022 | 39.NOKTA | 552392 | 4544143 |
| 26-27-28.09.2022 | 40.NOKTA | 555979 | 4543687 |
| 26-27-28.09.2022 | 41.NOKTA | 560252 | 4541819 |

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| | | | |
|---|---|---|---|
| 26-27-28.09.2022 | 42.NOKTA | 562553 | 4548347 |
| 26-27-28.09.2022 | 43.NOKTA | 568345 | 4548605 |
| **ÖLÇÜM TARİHİ** | **ÖLÇÜM NOKTASI NUMARASI** | **LOKASYON BİLGİSİ** | |
| 26-27-28.09.2022 | 44.NOKTA | 569552 | 4546811 |
| 26-27-28.09.2022 | 45.NOKTA | 570179 | 4544494 |
| 26-27-28.09.2022 | 46.NOKTA | 571562 | 4544339 |
| 26-27-28.09.2022 | 47.NOKTA | 574486 | 4548016 |
| 26-27-28.09.2022 | 48.NOKTA | 575241 | 4549476 |
| 26-27-28.09.2022 | 49.NOKTA | 578864 | 4549330 |
| 26-27-28.09.2022 | 50.NOKTA | 576549 | 4551913 |
| 29-30.09.2022-01.10.2022 | 51.NOKTA | 576082 | 4547948 |
| 29-30.09.2022-01.10.2022 | 52.NOKTA | 580171 | 4547562 |
| 29-30.09.2022-01.10.2022 | 53.NOKTA | 580496 | 4543967 |
| 29-30.09.2022-01.10.2022 | 54.NOKTA | 580799 | 4538260 |
| 29-30.09.2022-01.10.2022 | 55.NOKTA | 584542 | 4543854 |
| 29-30.09.2022-01.10.2022 | 56.NOKTA | 585300 | 4548362 |
| 29-30.09.2022-01.10.2022 | 57.NOKTA | 588163 | 4548683 |
| 29-30.09.2022-01.10.2022 | 58.NOKTA | 586483 | 4550069 |
| 29-30.09.2022-01.10.2022 | 59.NOKTA | 588893 | 4551242 |
| 29-30.09.2022-01.10.2022 | 60.NOKTA | 588815 | 4554539 |
| 29-30.09.2022-01.10.2022 | 61.NOKTA | 590046 | 4559119 |
| 29-30.09.2022-01.10.2022 | 62.NOKTA | 591887 | 4549969 |
| 29-30.09.2022-01.10.2022 | 63.NOKTA | 594478 | 4549785 |
| 29-30.09.2022-01.10.2022 | 64.NOKTA | 596088 | 4549563 |
| 29-30.09.2022-01.10.2022 | 65.NOKTA | 595540 | 4551889 |
| 29-30.09.2022-01.10.2022 | 66.NOKTA | 599082 | 4551542 |

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**1.GÜN**
**19-20.09.2022**
**1.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | | |
|---|---|---|---|
| | | 44,9 | 53,9 |
| 1 | 00:30 | 45,0 | 56,8 |
| 2 | 00:45 | 47,2 | 58,2 |
| 3 | 01:00 | 44,5 | 57,7 |
| 4 | 01:15 | 46,5 | 58,8 |
| 5 | 01:30 | 44,0 | 56,0 |
| 6 | 01:45 | 44,2 | 56,4 |
| 7 | 02:00 | 45,7 | 55,2 |
| 8 | 02:15 | 43,7 | 58,8 |
| 9 | 02:30 | 43,1 | 51,8 |
| 10 | 02:45 | 44,2 | 54,1 |
| 11 | 03:00 | 44,8 | 56,8 |
| 12 | 03:15 | 40,8 | 50,0 |
| 13 | 03:30 | 40,2 | 51,0 |
| 14 | 03:45 | 41,1 | 52,3 |
| 15 | 04:00 | 40,2 | 52,3 |
| 16 | 04:15 | 42,6 | 56,8 |
| 17 | 04:30 | 42,4 | 55,5 |
| 18 | 04:45 | 43,1 | 53,8 |
| 19 | 05:00 | 43,4 | 55,9 |
| 20 | 05:15 | 41,8 | 52,3 |
| 21 | 05:30 | 41,2 | 50,6 |
| 22 | 05:45 | 41,4 | 48,6 |
| 23 | 06:00 | 42,3 | 52,3 |
| 24 | 06:15 | 43,9 | 52,7 |
| 25 | 06:30 | 43,6 | 55,1 |
| 26 | 06:45 | 42,6 | 54,2 |
| 27 | 07:00 | 45,5 | 59,5 |
| 28 | 07:15 | 45,6 | 53,7 |
| 29 | 07:30 | 49,2 | 56,1 |
| 30 | 07:45 | 50,7 | 55,1 |
| 31 | 08:00 | 52,4 | 59,4 |
| 32 | 08:15 | 53,5 | 60,7 |
| 33 | 08:30 | 54,6 | 61,4 |
| 34 | 08:45 | 55,8 | 59,8 |
| 35 | 09:00 | 53,5 | 61,5 |
| 36 | 09:15 | 53,1 | 59,1 |
| 37 | 09:30 | 50,7 | 56,5 |
| 38 | 09:45 | 47,4 | 59,7 |
| 39 | 10:00 | 49,3 | 56,3 |
| 40 | 10:15 | 51,7 | 55,5 |
| 41 | 10:30 | 48,9 | 59,6 |
| 42 | 10:45 | 49,9 | 55,1 |
| 43 | 11:00 | 48,3 | 55,2 |
| 44 | 11:15 | 52,3 | 55,8 |
| 45 | 11:30 | 50,1 | 57,7 |
| 46 | 11:45 | 48,6 | 56,5 |
| 47 | 12:00 | 48,5 | 54,3 |
| 48 | 12:15 | 48,2 | 52,7 |
| 49 | 12:30 | 48,3 | 55,1 |
| 50 | 12:45 | 48,9 | 61,6 |
| 51 | 13:00 | 50,1 | 55,9 |
| 52 | 13:15 | 51,2 | 59,6 |
| 53 | 13:30 | 49,3 | 54,7 |
| 54 | 13:45 | 51,1 | 58,9 |
| 55 | 14:00 | 51,0 | 54,3 |
| 56 | 14:15 | 50,7 | 60,3 |
| 57 | 14:30 | 48,6 | 56,0 |
| 58 | 14:45 | 49,2 | 59,2 |
| 59 | 15:00 | 49,3 | 59,2 |
| 60 | 15:15 | 48,8 | 56,5 |
| 61 | 15:30 | 47,3 | 60,6 |
| 62 | 15:45 | 48,6 | 58,8 |
| 63 | 16:00 | 50,8 | 58,2 |
| 64 | 16:15 | 47,8 | 54,6 |
| 65 | 16:30 | 47,4 | 53,6 |
| 66 | 16:45 | 47,1 | 56,4 |
| 67 | 17:00 | 48,1 | 55,0 |
| 68 | 17:15 | 47,5 | 56,3 |
| 69 | 17:30 | 50,8 | 55,7 |
| 70 | 17:45 | 46,8 | 53,2 |
| 71 | 18:00 | 49,6 | 57,2 |
| 72 | 18:15 | 50,2 | 56,2 |
| 73 | 18:30 | 46,3 | 53,1 |
| 74 | 18:45 | 49,3 | 60,8 |
| 75 | 19:00 | 46,8 | 59,9 |
| 76 | 19:15 | 46,8 | 57,5 |
| 77 | 19:30 | 48,6 | 57,4 |
| 78 | 19:45 | 45,7 | 54,4 |
| 79 | 20:00 | 46,0 | 55,5 |
| 80 | 20:15 | 43,8 | 49,4 |
| 81 | 20:30 | 42,7 | 51,0 |
| 82 | 20:45 | 45,6 | 51,2 |

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| | | | |
|---|---|---|---|
| 83 | 21:00 | 44,4 | 51,4 |
| 84 | 21:15 | 45,6 | 54,3 |
| 85 | 21:30 | 45,3 | 54,4 |
| 86 | 21:45 | 42,4 | 52,4 |
| 87 | 22:00 | 44,0 | 55,8 |
| 88 | 22:15 | 44,9 | 56,1 |
| 89 | 22:30 | 46,5 | 56,1 |
| 90 | 22:45 | 45,1 | 56,1 |
| 91 | 23:00 | 44,4 | 52,7 |
| 92 | 23:15 | 44,1 | 52,9 |
| 93 | 23:30 | 44,7 | 54,3 |
| 94 | 23:45 | 43,6 | 54,2 |
| 95 | 00:00 | 45,7 | 55,7 |
| 96 | 00:15 | 44,9 | 53,9 |

**1.GÜN**
**19-20.09.2022**
**2.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,7 | 49,1 |
| 2 | 00:45 | 43,3 | 51,9 |
| 3 | 01:00 | 41,5 | 51,9 |
| 4 | 01:15 | 41,5 | 50,6 |
| 5 | 01:30 | 42,9 | 51,8 |
| 6 | 01:45 | 42,8 | 51,0 |
| 7 | 02:00 | 41,5 | 49,1 |
| 8 | 02:15 | 44,5 | 52,6 |
| 9 | 02:30 | 40,6 | 50,2 |
| 10 | 02:45 | 41,2 | 49,7 |
| 11 | 03:00 | 42,9 | 52,4 |
| 12 | 03:15 | 43,1 | 53,7 |
| 13 | 03:30 | 43,1 | 53,2 |
| 14 | 03:45 | 42,4 | 52,3 |
| 15 | 04:00 | 44,1 | 53,7 |
| 16 | 04:15 | 41,1 | 49,8 |
| 17 | 04:30 | 44,9 | 52,7 |
| 18 | 04:45 | 42,0 | 51,0 |
| 19 | 05:00 | 45,8 | 55,6 |
| 20 | 05:15 | 40,2 | 49,7 |
| 21 | 05:30 | 42,8 | 53,1 |
| 22 | 05:45 | 41,2 | 49,4 |
| 23 | 06:00 | 38,3 | 47,1 |
| 24 | 06:15 | 41,5 | 50,3 |
| 25 | 06:30 | 43,6 | 53,0 |
| 26 | 06:45 | 41,9 | 50,5 |
| 27 | 07:00 | 44,4 | 53,5 |
| 28 | 07:15 | 45,9 | 55,2 |
| 29 | 07:30 | 46,6 | 55,8 |
| 30 | 07:45 | 49,0 | 55,8 |
| 31 | 08:00 | 52,2 | 56,6 |
| 32 | 08:15 | 49,8 | 59,4 |
| 33 | 08:30 | 49,8 | 59,1 |
| 34 | 08:45 | 50,4 | 58,4 |
| 35 | 09:00 | 50,1 | 61,1 |
| 36 | 09:15 | 50,0 | 63,6 |
| 37 | 09:30 | 51,3 | 63,3 |
| 38 | 09:45 | 52,5 | 60,0 |
| 39 | 10:00 | 49,9 | 62,5 |
| 40 | 10:15 | 51,3 | 62,7 |
| 41 | 10:30 | 48,7 | 62,6 |
| 42 | 10:45 | 51,5 | 60,6 |
| 43 | 11:00 | 51,0 | 62,3 |
| 44 | 11:15 | 49,7 | 61,2 |
| 45 | 11:30 | 50,9 | 61,0 |
| 46 | 11:45 | 49,8 | 57,7 |
| 47 | 12:00 | 45,9 | 57,0 |
| 48 | 12:15 | 48,2 | 55,8 |
| 49 | 12:30 | 47,4 | 53,7 |
| 50 | 12:45 | 47,6 | 54,2 |
| 51 | 13:00 | 48,7 | 57,4 |
| 52 | 13:15 | 50,4 | 57,6 |
| 53 | 13:30 | 50,1 | 57,3 |
| 54 | 13:45 | 48,6 | 56,7 |
| 55 | 14:00 | 48,5 | 53,7 |
| 56 | 14:15 | 48,6 | 56,1 |
| 57 | 14:30 | 49,9 | 56,8 |
| 58 | 14:45 | 46,7 | 52,4 |
| 59 | 15:00 | 50,3 | 57,0 |
| 60 | 15:15 | 49,6 | 56,4 |
| 61 | 15:30 | 48,6 | 54,7 |
| 62 | 15:45 | 46,7 | 52,9 |
| 63 | 16:00 | 46,1 | 53,0 |
| 64 | 16:15 | 49,3 | 54,1 |
| 65 | 16:30 | 47,8 | 52,8 |
| 66 | 16:45 | 45,7 | 50,3 |
| 67 | 17:00 | 48,4 | 53,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 68 | 17:15 | 45,1 | 52,0 |
| 69 | 17:30 | 46,7 | 52,9 |
| 70 | 17:45 | 47,7 | 54,2 |
| 71 | 18:00 | 47,1 | 57,3 |
| 72 | 18:15 | 46,7 | 56,9 |
| 73 | 18:30 | 45,8 | 55,9 |
| 74 | 18:45 | 45,2 | 55,1 |
| 75 | 19:00 | 47,2 | 55,8 |
| 76 | 19:15 | 44,9 | 54,7 |
| 77 | 19:30 | 47,0 | 58,1 |
| 78 | 19:45 | 47,0 | 56,6 |
| 79 | 20:00 | 44,9 | 53,7 |
| 80 | 20:15 | 44,5 | 52,4 |
| 81 | 20:30 | 43,9 | 52,4 |
| 82 | 20:45 | 40,2 | 47,9 |
| 83 | 21:00 | 39,6 | 48,8 |
| 84 | 21:15 | 40,3 | 47,3 |
| 85 | 21:30 | 43,3 | 50,5 |
| 86 | 21:45 | 41,6 | 51,1 |
| 87 | 22:00 | 39,7 | 48,4 |
| 88 | 22:15 | 42,2 | 49,0 |
| 89 | 22:30 | 39,1 | 48,6 |
| 90 | 22:45 | 41,5 | 51,4 |
| 91 | 23:00 | 39,5 | 48,2 |
| 92 | 23:15 | 39,0 | 48,5 |
| 93 | 23:30 | 39,5 | 48,1 |
| 94 | 23:45 | 36,8 | 45,2 |
| 95 | 00:00 | 36,7 | 44,4 |
| 96 | 00:15 | 36,6 | 44,2 |

**1.GÜN**
**19-20.09.2022**
**3.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,5 | 47,5 |
| 2 | 00:45 | 41,9 | 48,1 |
| 3 | 01:00 | 43,9 | 49,3 |
| 4 | 01:15 | 41,3 | 47,7 |
| 5 | 01:30 | 43,0 | 50,7 |
| 6 | 01:45 | 42,0 | 47,0 |
| 7 | 02:00 | 42,3 | 48,4 |
| 8 | 02:15 | 43,3 | 49,3 |
| 9 | 02:30 | 41,3 | 47,9 |
| 10 | 02:45 | 40,2 | 46,4 |
| 11 | 03:00 | 40,1 | 46,8 |
| 12 | 03:15 | 42,3 | 47,3 |
| 13 | 03:30 | 40,8 | 46,9 |
| 14 | 03:45 | 40,6 | 47,0 |
| 15 | 04:00 | 40,3 | 46,3 |
| 16 | 04:15 | 39,9 | 46,3 |
| 17 | 04:30 | 41,3 | 46,9 |
| 18 | 04:45 | 41,5 | 47,8 |
| 19 | 05:00 | 42,7 | 49,3 |
| 20 | 05:15 | 41,4 | 47,8 |
| 21 | 05:30 | 41,3 | 46,7 |
| 22 | 05:45 | 39,1 | 46,0 |
| 23 | 06:00 | 39,7 | 46,4 |
| 24 | 06:15 | 41,1 | 47,9 |
| 25 | 06:30 | 41,9 | 49,6 |
| 26 | 06:45 | 42,3 | 48,2 |
| 27 | 07:00 | 41,5 | 49,3 |
| 28 | 07:15 | 45,1 | 51,4 |
| 29 | 07:30 | 45,8 | 52,8 |
| 30 | 07:45 | 48,7 | 53,7 |
| 31 | 08:00 | 48,2 | 54,6 |
| 32 | 08:15 | 48,6 | 53,7 |
| 33 | 08:30 | 50,5 | 55,5 |
| 34 | 08:45 | 50,7 | 59,0 |
| 35 | 09:00 | 51,8 | 59,9 |
| 36 | 09:15 | 53,1 | 58,8 |
| 37 | 09:30 | 53,0 | 58,5 |
| 38 | 09:45 | 50,5 | 56,5 |
| 39 | 10:00 | 50,0 | 55,6 |
| 40 | 10:15 | 52,8 | 58,8 |
| 41 | 10:30 | 53,6 | 58,6 |
| 42 | 10:45 | 51,2 | 57,2 |
| 43 | 11:00 | 52,4 | 57,7 |
| 44 | 11:15 | 50,7 | 57,2 |
| 45 | 11:30 | 55,2 | 62,6 |
| 46 | 11:45 | 53,6 | 59,0 |
| 47 | 12:00 | 52,8 | 58,3 |
| 48 | 12:15 | 53,4 | 56,6 |
| 49 | 12:30 | 54,4 | 58,6 |
| 50 | 12:45 | 54,8 | 56,7 |
| 51 | 13:00 | 51,9 | 60,6 |
| 52 | 13:15 | 55,2 | 59,2 |
| 53 | 13:30 | 52,7 | 60,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 54 | 13:45 | 53,9 | 58,4 |
| 55 | 14:00 | 51,9 | 60,5 |
| 56 | 14:15 | 55,4 | 58,7 |
| 57 | 14:30 | 52,3 | 64,6 |
| 58 | 14:45 | 52,6 | 62,6 |
| 59 | 15:00 | 52,5 | 64,8 |
| 60 | 15:15 | 53,2 | 62,9 |
| 61 | 15:30 | 54,9 | 61,2 |
| 62 | 15:45 | 53,3 | 60,4 |
| 63 | 16:00 | 54,6 | 61,4 |
| 64 | 16:15 | 53,6 | 62,4 |
| 65 | 16:30 | 54,5 | 58,6 |
| 66 | 16:45 | 53,9 | 59,4 |
| 67 | 17:00 | 55,6 | 60,2 |
| 68 | 17:15 | 53,6 | 60,5 |
| 69 | 17:30 | 52,2 | 62,1 |
| 70 | 17:45 | 52,6 | 63,0 |
| 71 | 18:00 | 53,7 | 62,0 |
| 72 | 18:15 | 48,6 | 56,2 |
| 73 | 18:30 | 48,9 | 55,8 |
| 74 | 18:45 | 47,9 | 55,5 |
| 75 | 19:00 | 51,2 | 58,2 |
| 76 | 19:15 | 49,7 | 57,3 |
| 77 | 19:30 | 50,1 | 56,6 |
| 78 | 19:45 | 50,7 | 57,7 |
| 79 | 20:00 | 51,0 | 56,9 |
| 80 | 20:15 | 50,3 | 56,7 |
| 81 | 20:30 | 46,8 | 52,3 |
| 82 | 20:45 | 44,7 | 51,3 |
| 83 | 21:00 | 45,6 | 51,8 |
| 84 | 21:15 | 43,3 | 49,5 |
| 85 | 21:30 | 44,8 | 51,8 |
| 86 | 21:45 | 44,9 | 50,7 |
| 87 | 22:00 | 42,7 | 49,2 |
| 88 | 22:15 | 43,9 | 51,1 |
| 89 | 22:30 | 41,7 | 49,3 |
| 90 | 22:45 | 45,0 | 52,0 |
| 91 | 23:00 | 45,8 | 54,0 |
| 92 | 23:15 | 45,8 | 53,1 |
| 93 | 23:30 | 45,7 | 52,2 |
| 94 | 23:45 | 44,5 | 49,9 |
| 95 | 00:00 | 42,6 | 49,4 |
| 96 | 00:15 | 44,7 | 50,9 |

**1.GÜN**
**19-20.09.2022**
**4.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,2 | 64,6 |
| 2 | 00:45 | 44,5 | 64,1 |
| 3 | 01:00 | 44,9 | 67,2 |
| 4 | 01:15 | 45,1 | 69,6 |
| 5 | 01:30 | 45,0 | 64,6 |
| 6 | 01:45 | 44,8 | 68,7 |
| 7 | 02:00 | 41,9 | 57,0 |
| 8 | 02:15 | 43,6 | 67,9 |
| 9 | 02:30 | 43,8 | 62,8 |
| 10 | 02:45 | 44,1 | 65,5 |
| 11 | 03:00 | 44,4 | 59,4 |
| 12 | 03:15 | 44,5 | 62,9 |
| 13 | 03:30 | 45,9 | 68,0 |
| 14 | 03:45 | 45,5 | 70,5 |
| 15 | 04:00 | 45,7 | 65,6 |
| 16 | 04:15 | 45,9 | 67,9 |
| 17 | 04:30 | 45,4 | 69,8 |
| 18 | 04:45 | 41,2 | 63,0 |
| 19 | 05:00 | 42,4 | 60,2 |
| 20 | 05:15 | 40,4 | 57,4 |
| 21 | 05:30 | 41,7 | 57,7 |
| 22 | 05:45 | 39,8 | 57,3 |
| 23 | 06:00 | 37,7 | 57,6 |
| 24 | 06:15 | 39,3 | 56,7 |
| 25 | 06:30 | 41,4 | 58,1 |
| 26 | 06:45 | 40,9 | 51,8 |
| 27 | 07:00 | 41,2 | 57,7 |
| 28 | 07:15 | 40,6 | 54,0 |
| 29 | 07:30 | 44,0 | 56,0 |
| 30 | 07:45 | 46,7 | 56,5 |
| 31 | 08:00 | 48,1 | 53,5 |
| 32 | 08:15 | 49,6 | 56,0 |
| 33 | 08:30 | 49,5 | 52,4 |
| 34 | 08:45 | 50,2 | 55,5 |
| 35 | 09:00 | 50,6 | 56,7 |
| 36 | 09:15 | 50,8 | 58,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 37 | 09:30 | 51,3 | 60,2 |
| 38 | 09:45 | 51,9 | 56,7 |
| 39 | 10:00 | 52,2 | 59,4 |
| 40 | 10:15 | 52,0 | 55,8 |
| 41 | 10:30 | 52,4 | 59,1 |
| 42 | 10:45 | 51,2 | 56,6 |
| 43 | 11:00 | 51,7 | 59,0 |
| 44 | 11:15 | 52,4 | 59,5 |
| 45 | 11:30 | 52,0 | 61,3 |
| 46 | 11:45 | 51,2 | 58,1 |
| 47 | 12:00 | 51,0 | 56,1 |
| 48 | 12:15 | 51,5 | 58,3 |
| 49 | 12:30 | 52,0 | 59,6 |
| 50 | 12:45 | 51,9 | 60,2 |
| 51 | 13:00 | 51,3 | 62,1 |
| 52 | 13:15 | 54,5 | 59,0 |
| 53 | 13:30 | 52,4 | 57,4 |
| 54 | 13:45 | 52,1 | 59,9 |
| 55 | 14:00 | 52,3 | 56,5 |
| 56 | 14:15 | 52,4 | 59,1 |
| 57 | 14:30 | 49,7 | 55,9 |
| 58 | 14:45 | 51,3 | 57,4 |
| 59 | 15:00 | 48,7 | 56,0 |
| 60 | 15:15 | 51,0 | 58,1 |
| 61 | 15:30 | 52,2 | 56,4 |
| 62 | 15:45 | 50,8 | 58,7 |
| 63 | 16:00 | 51,4 | 59,6 |
| 64 | 16:15 | 51,5 | 58,3 |
| 65 | 16:30 | 51,0 | 59,1 |
| 66 | 16:45 | 49,0 | 58,2 |
| 67 | 17:00 | 49,7 | 54,4 |
| 68 | 17:15 | 49,8 | 58,1 |
| 69 | 17:30 | 50,1 | 56,9 |
| 70 | 17:45 | 50,3 | 58,0 |
| 71 | 18:00 | 50,7 | 59,1 |
| 72 | 18:15 | 51,5 | 59,7 |
| 73 | 18:30 | 49,2 | 61,4 |
| 74 | 18:45 | 52,4 | 63,3 |
| 75 | 19:00 | 49,8 | 58,9 |
| 76 | 19:15 | 48,0 | 54,2 |
| 77 | 19:30 | 52,1 | 62,4 |
| 78 | 19:45 | 51,9 | 65,1 |
| 79 | 20:00 | 51,3 | 56,5 |
| 80 | 20:15 | 44,6 | 57,9 |
| 81 | 20:30 | 41,6 | 59,8 |
| 82 | 20:45 | 41,0 | 58,2 |
| 83 | 21:00 | 40,1 | 52,4 |
| 84 | 21:15 | 41,1 | 54,3 |
| 85 | 21:30 | 41,3 | 56,3 |
| 86 | 21:45 | 40,9 | 56,1 |
| 87 | 22:00 | 41,0 | 54,4 |
| 88 | 22:15 | 41,1 | 52,1 |
| 89 | 22:30 | 41,2 | 56,8 |
| 90 | 22:45 | 40,0 | 59,9 |
| 91 | 23:00 | 40,9 | 57,6 |
| 92 | 23:15 | 40,4 | 56,0 |
| 93 | 23:30 | 35,8 | 52,1 |
| 94 | 23:45 | 35,0 | 52,4 |
| 95 | 00:00 | 36,2 | 55,6 |
| 96 | 00:15 | 37,1 | 56,2 |

**1.GÜN**
**19-20.09.2022**
**5.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 46,1 | 58,5 |
| 2 | 00:45 | 44,1 | 56,7 |
| 3 | 01:00 | 44,9 | 59,5 |
| 4 | 01:15 | 46,4 | 64,8 |
| 5 | 01:30 | 46,1 | 60,1 |
| 6 | 01:45 | 45,7 | 58,6 |
| 7 | 02:00 | 43,1 | 53,1 |
| 8 | 02:15 | 44,7 | 63,4 |
| 9 | 02:30 | 41,5 | 55,6 |
| 10 | 02:45 | 43,1 | 58,2 |
| 11 | 03:00 | 43,2 | 52,7 |
| 12 | 03:15 | 42,9 | 55,1 |
| 13 | 03:30 | 44,2 | 59,6 |
| 14 | 03:45 | 43,9 | 61,7 |
| 15 | 04:00 | 44,0 | 57,6 |
| 16 | 04:15 | 44,2 | 59,5 |
| 17 | 04:30 | 43,8 | 61,3 |
| 18 | 04:45 | 44,2 | 58,2 |
| 19 | 05:00 | 46,1 | 56,1 |
| 20 | 05:15 | 43,7 | 53,5 |
| 21 | 05:30 | 45,1 | 53,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 22 | 05:45 | 43,2 | 53,1 |
| 23 | 06:00 | 38,9 | 51,1 |
| 24 | 06:15 | 40,5 | 50,5 |
| 25 | 06:30 | 42,5 | 51,3 |
| 26 | 06:45 | 42,3 | 48,4 |
| 27 | 07:00 | 44,1 | 58,6 |
| 28 | 07:15 | 43,7 | 54,8 |
| 29 | 07:30 | 47,1 | 56,7 |
| 30 | 07:45 | 50,8 | 57,3 |
| 31 | 08:00 | 51,0 | 53,7 |
| 32 | 08:15 | 49,8 | 56,1 |
| 33 | 08:30 | 50,1 | 53,6 |
| 34 | 08:45 | 49,6 | 56,3 |
| 35 | 09:00 | 49,4 | 57,7 |
| 36 | 09:15 | 51,6 | 59,7 |
| 37 | 09:30 | 52,0 | 61,1 |
| 38 | 09:45 | 50,8 | 57,7 |
| 39 | 10:00 | 51,7 | 58,0 |
| 40 | 10:15 | 51,5 | 58,0 |
| 41 | 10:30 | 52,0 | 57,7 |
| 42 | 10:45 | 52,7 | 60,2 |
| 43 | 11:00 | 54,6 | 60,0 |
| 44 | 11:15 | 52,8 | 60,6 |
| 45 | 11:30 | 53,6 | 62,2 |
| 46 | 11:45 | 54,9 | 58,8 |
| 47 | 12:00 | 52,9 | 60,3 |
| 48 | 12:15 | 53,7 | 57,2 |
| 49 | 12:30 | 53,8 | 58,6 |
| 50 | 12:45 | 54,0 | 59,2 |
| 51 | 13:00 | 53,4 | 61,1 |
| 52 | 13:15 | 52,5 | 60,0 |
| 53 | 13:30 | 52,2 | 58,3 |
| 54 | 13:45 | 53,7 | 60,8 |
| 55 | 14:00 | 52,0 | 57,3 |
| 56 | 14:15 | 53,1 | 60,1 |
| 57 | 14:30 | 51,7 | 61,0 |
| 58 | 14:45 | 52,0 | 58,3 |
| 59 | 15:00 | 49,3 | 56,9 |
| 60 | 15:15 | 51,7 | 59,1 |
| 61 | 15:30 | 52,9 | 57,1 |
| 62 | 15:45 | 51,6 | 54,8 |
| 63 | 16:00 | 52,2 | 59,1 |
| 64 | 16:15 | 52,2 | 57,2 |
| 65 | 16:30 | 50,2 | 56,2 |
| 66 | 16:45 | 48,2 | 58,2 |
| 67 | 17:00 | 48,9 | 58,4 |
| 68 | 17:15 | 49,0 | 57,8 |
| 69 | 17:30 | 50,7 | 57,7 |
| 70 | 17:45 | 51,1 | 58,9 |
| 71 | 18:00 | 51,4 | 59,9 |
| 72 | 18:15 | 52,2 | 60,6 |
| 73 | 18:30 | 50,0 | 62,2 |
| 74 | 18:45 | 53,0 | 64,4 |
| 75 | 19:00 | 50,5 | 59,7 |
| 76 | 19:15 | 48,1 | 59,4 |
| 77 | 19:30 | 50,6 | 60,9 |
| 78 | 19:45 | 53,5 | 60,7 |
| 79 | 20:00 | 51,9 | 57,4 |
| 80 | 20:15 | 44,9 | 58,8 |
| 81 | 20:30 | 44,6 | 60,6 |
| 82 | 20:45 | 47,4 | 59,1 |
| 83 | 21:00 | 46,5 | 53,1 |
| 84 | 21:15 | 45,6 | 53,5 |
| 85 | 21:30 | 43,9 | 55,5 |
| 86 | 21:45 | 44,9 | 55,2 |
| 87 | 22:00 | 43,9 | 53,6 |
| 88 | 22:15 | 47,8 | 55,8 |
| 89 | 22:30 | 45,5 | 57,6 |
| 90 | 22:45 | 42,6 | 58,6 |
| 91 | 23:00 | 43,3 | 56,2 |
| 92 | 23:15 | 44,8 | 56,5 |
| 93 | 23:30 | 39,5 | 55,8 |
| 94 | 23:45 | 39,5 | 53,0 |
| 95 | 00:00 | 40,6 | 56,2 |
| 96 | 00:15 | 43,4 | 60,9 |

**1.GÜN**
**19-20.09.2022**
**6.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,5 | 55,8 |
| 2 | 00:45 | 38,8 | 57,6 |
| 3 | 01:00 | 39,8 | 59,1 |
| 4 | 01:15 | 41,9 | 60,6 |
| 5 | 01:30 | 43,2 | 62,1 |
| 6 | 01:45 | 42,1 | 61,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 02:00 | 41,9 | 56,9 | 51 | 13:00 | 51,8 | 57,1 |
| 8 | 02:15 | 41,7 | 57,2 | 52 | 13:15 | 52,0 | 60,5 |
| 9 | 02:30 | 42,0 | 60,1 | 53 | 13:30 | 52,3 | 61,0 |
| 10 | 02:45 | 40,7 | 57,9 | 54 | 13:45 | 52,7 | 59,4 |
| 11 | 03:00 | 40,9 | 54,6 | 55 | 14:00 | 51,9 | 62,2 |
| 12 | 03:15 | 41,7 | 58,9 | 56 | 14:15 | 52,2 | 60,1 |
| 13 | 03:30 | 40,9 | 60,5 | 57 | 14:30 | 52,6 | 61,7 |
| 14 | 03:45 | 40,9 | 63,2 | 58 | 14:45 | 51,9 | 61,9 |
| 15 | 04:00 | 40,7 | 58,2 | 59 | 15:00 | 51,4 | 59,9 |
| 16 | 04:15 | 40,5 | 59,8 | 60 | 15:15 | 52,5 | 61,9 |
| 17 | 04:30 | 42,2 | 61,9 | 61 | 15:30 | 51,4 | 61,5 |
| 18 | 04:45 | 43,0 | 63,5 | 62 | 15:45 | 52,6 | 61,3 |
| 19 | 05:00 | 42,6 | 60,4 | 63 | 16:00 | 53,9 | 60,7 |
| 20 | 05:15 | 42,2 | 59,9 | 64 | 16:15 | 51,6 | 61,0 |
| 21 | 05:30 | 41,9 | 57,9 | 65 | 16:30 | 50,5 | 59,5 |
| 22 | 05:45 | 39,6 | 57,1 | 66 | 16:45 | 51,2 | 59,3 |
| 23 | 06:00 | 37,7 | 57,6 | 67 | 17:00 | 51,3 | 60,9 |
| 24 | 06:15 | 37,0 | 53,4 | 68 | 17:15 | 51,8 | 60,0 |
| 25 | 06:30 | 38,8 | 54,5 | 69 | 17:30 | 52,7 | 62,6 |
| 26 | 06:45 | 37,9 | 52,2 | 70 | 17:45 | 51,8 | 61,3 |
| 27 | 07:00 | 43,0 | 49,4 | 71 | 18:00 | 51,5 | 62,5 |
| 28 | 07:15 | 44,2 | 50,8 | 72 | 18:15 | 46,7 | 63,0 |
| 29 | 07:30 | 44,1 | 49,4 | 73 | 18:30 | 45,4 | 63,4 |
| 30 | 07:45 | 44,9 | 49,9 | 74 | 18:45 | 39,9 | 60,2 |
| 31 | 08:00 | 44,4 | 55,5 | 75 | 19:00 | 41,1 | 61,5 |
| 32 | 08:15 | 44,5 | 56,7 | 76 | 19:15 | 41,5 | 61,8 |
| 33 | 08:30 | 44,8 | 57,7 | 77 | 19:30 | 47,3 | 60,9 |
| 34 | 08:45 | 49,2 | 56,6 | 78 | 19:45 | 49,1 | 57,4 |
| 35 | 09:00 | 49,7 | 57,3 | 79 | 20:00 | 48,5 | 59,2 |
| 36 | 09:15 | 49,9 | 55,6 | 80 | 20:15 | 43,7 | 57,1 |
| 37 | 09:30 | 50,0 | 57,7 | 81 | 20:30 | 42,6 | 61,3 |
| 38 | 09:45 | 49,7 | 56,6 | 82 | 20:45 | 38,3 | 54,6 |
| 39 | 10:00 | 47,4 | 55,8 | 83 | 21:00 | 39,5 | 51,8 |
| 40 | 10:15 | 48,2 | 57,6 | 84 | 21:15 | 37,7 | 50,1 |
| 41 | 10:30 | 47,4 | 56,8 | 85 | 21:30 | 39,5 | 54,0 |
| 42 | 10:45 | 49,2 | 59,6 | 86 | 21:45 | 37,1 | 50,8 |
| 43 | 11:00 | 46,9 | 56,1 | 87 | 22:00 | 39,0 | 52,0 |
| 44 | 11:15 | 46,4 | 54,0 | 88 | 22:15 | 38,7 | 52,0 |
| 45 | 11:30 | 47,5 | 55,2 | 89 | 22:30 | 38,8 | 53,8 |
| 46 | 11:45 | 48,3 | 56,6 | 90 | 22:45 | 39,2 | 50,6 |
| 47 | 12:00 | 46,0 | 53,5 | 91 | 23:00 | 38,6 | 50,4 |
| 48 | 12:15 | 45,1 | 56,6 | 92 | 23:15 | 39,7 | 53,4 |
| 49 | 12:30 | 46,1 | 54,6 | 93 | 23:30 | 36,1 | 51,7 |
| 50 | 12:45 | 50,6 | 58,0 | 94 | 23:45 | 36,8 | 53,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 95 | 00:00 | 36,5 | 52,8 |
| 96 | 00:15 | 38,5 | 50,6 |

**1.GÜN**
**19-20.09.2022**
**7.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,3 | 59,9 |
| 2 | 00:45 | 40,0 | 54,7 |
| 3 | 01:00 | 39,6 | 55,4 |
| 4 | 01:15 | 41,0 | 55,6 |
| 5 | 01:30 | 41,6 | 55,0 |
| 6 | 01:45 | 40,9 | 54,7 |
| 7 | 02:00 | 41,6 | 57,2 |
| 8 | 02:15 | 42,0 | 55,4 |
| 9 | 02:30 | 40,7 | 56,8 |
| 10 | 02:45 | 40,2 | 54,6 |
| 11 | 03:00 | 41,8 | 56,4 |
| 12 | 03:15 | 42,0 | 59,6 |
| 13 | 03:30 | 41,1 | 56,7 |
| 14 | 03:45 | 40,8 | 57,9 |
| 15 | 04:00 | 40,5 | 58,6 |
| 16 | 04:15 | 40,7 | 57,2 |
| 17 | 04:30 | 39,1 | 53,3 |
| 18 | 04:45 | 41,1 | 58,1 |
| 19 | 05:00 | 42,0 | 57,1 |
| 20 | 05:15 | 41,4 | 56,7 |
| 21 | 05:30 | 41,7 | 59,3 |
| 22 | 05:45 | 42,0 | 58,3 |
| 23 | 06:00 | 39,6 | 55,5 |
| 24 | 06:15 | 37,9 | 55,1 |
| 25 | 06:30 | 42,4 | 56,7 |
| 26 | 06:45 | 41,8 | 58,2 |
| 27 | 07:00 | 47,6 | 59,0 |
| 28 | 07:15 | 50,9 | 58,4 |
| 29 | 07:30 | 50,7 | 59,4 |
| 30 | 07:45 | 49,6 | 57,4 |
| 31 | 08:00 | 48,5 | 61,5 |
| 32 | 08:15 | 51,3 | 65,2 |
| 33 | 08:30 | 49,5 | 63,9 |
| 34 | 08:45 | 53,8 | 61,8 |
| 35 | 09:00 | 55,8 | 64,5 |
| 36 | 09:15 | 56,0 | 62,4 |
| 37 | 09:30 | 56,1 | 64,9 |
| 38 | 09:45 | 55,8 | 63,6 |
| 39 | 10:00 | 54,5 | 64,3 |
| 40 | 10:15 | 54,9 | 65,7 |
| 41 | 10:30 | 54,1 | 64,9 |
| 42 | 10:45 | 56,1 | 68,0 |
| 43 | 11:00 | 53,6 | 64,0 |
| 44 | 11:15 | 53,0 | 61,6 |
| 45 | 11:30 | 52,5 | 61,0 |
| 46 | 11:45 | 53,5 | 62,5 |
| 47 | 12:00 | 52,9 | 61,5 |
| 48 | 12:15 | 49,8 | 62,5 |
| 49 | 12:30 | 53,0 | 62,8 |
| 50 | 12:45 | 55,9 | 64,3 |
| 51 | 13:00 | 58,5 | 66,4 |
| 52 | 13:15 | 58,0 | 66,1 |
| 53 | 13:30 | 59,0 | 70,1 |
| 54 | 13:45 | 58,3 | 65,6 |
| 55 | 14:00 | 59,9 | 71,7 |
| 56 | 14:15 | 58,9 | 69,2 |
| 57 | 14:30 | 58,2 | 68,2 |
| 58 | 14:45 | 56,9 | 67,9 |
| 59 | 15:00 | 58,1 | 69,0 |
| 60 | 15:15 | 59,9 | 69,1 |
| 61 | 15:30 | 58,1 | 70,7 |
| 62 | 15:45 | 58,7 | 68,4 |
| 63 | 16:00 | 57,7 | 69,8 |
| 64 | 16:15 | 58,8 | 70,9 |
| 65 | 16:30 | 55,8 | 65,7 |
| 66 | 16:45 | 58,8 | 68,3 |
| 67 | 17:00 | 56,7 | 67,4 |
| 68 | 17:15 | 57,3 | 66,2 |
| 69 | 17:30 | 56,0 | 72,1 |
| 70 | 17:45 | 54,9 | 70,5 |
| 71 | 18:00 | 55,6 | 67,5 |
| 72 | 18:15 | 55,0 | 68,0 |
| 73 | 18:30 | 52,6 | 68,4 |
| 74 | 18:45 | 51,1 | 62,1 |
| 75 | 19:00 | 49,9 | 62,2 |
| 76 | 19:15 | 47,4 | 59,5 |
| 77 | 19:30 | 45,0 | 59,4 |
| 78 | 19:45 | 43,3 | 62,3 |
| 79 | 20:00 | 42,6 | 62,8 |
| 80 | 20:15 | 40,4 | 58,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 81 | 20:30 | 41,8 | 61,8 |
| 82 | 20:45 | 40,0 | 59,3 |
| 83 | 21:00 | 41,3 | 60,5 |
| 84 | 21:15 | 39,1 | 55,3 |
| 85 | 21:30 | 39,9 | 58,2 |
| 86 | 21:45 | 39,9 | 55,3 |
| 87 | 22:00 | 41,2 | 56,8 |
| 88 | 22:15 | 40,6 | 58,2 |
| 89 | 22:30 | 41,8 | 59,4 |
| 90 | 22:45 | 40,1 | 55,3 |
| 91 | 23:00 | 43,0 | 53,6 |
| 92 | 23:15 | 44,7 | 55,6 |
| 93 | 23:30 | 45,0 | 59,5 |
| 94 | 23:45 | 46,0 | 59,4 |
| 95 | 00:00 | 43,9 | 61,0 |
| 96 | 00:15 | 42,4 | 60,3 |

**1.GÜN**
**19-20.09.2022**
**8.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 34,3 | 56,6 |
| 2 | 00:45 | 34,0 | 51,9 |
| 3 | 01:00 | 33,9 | 52,3 |
| 4 | 01:15 | 35,2 | 52,4 |
| 5 | 01:30 | 35,8 | 52,3 |
| 6 | 01:45 | 35,1 | 51,9 |
| 7 | 02:00 | 35,8 | 54,1 |
| 8 | 02:15 | 36,1 | 52,4 |
| 9 | 02:30 | 34,7 | 53,7 |
| 10 | 02:45 | 34,4 | 51,8 |
| 11 | 03:00 | 36,0 | 53,2 |
| 12 | 03:15 | 36,1 | 56,3 |
| 13 | 03:30 | 35,3 | 53,6 |
| 14 | 03:45 | 34,2 | 53,7 |
| 15 | 04:00 | 33,9 | 54,5 |
| 16 | 04:15 | 34,1 | 53,1 |
| 17 | 04:30 | 32,8 | 49,3 |
| 18 | 04:45 | 34,3 | 53,9 |
| 19 | 05:00 | 35,2 | 53,0 |
| 20 | 05:15 | 34,6 | 52,5 |
| 21 | 05:30 | 35,0 | 54,9 |
| 22 | 05:45 | 35,3 | 51,4 |
| 23 | 06:00 | 33,1 | 51,3 |
| 24 | 06:15 | 37,2 | 55,0 |
| 25 | 06:30 | 37,5 | 55,9 |
| 26 | 06:45 | 37,2 | 55,1 |
| 27 | 07:00 | 41,6 | 59,2 |
| 28 | 07:15 | 42,9 | 60,9 |
| 29 | 07:30 | 42,6 | 59,4 |
| 30 | 07:45 | 43,7 | 60,3 |
| 31 | 08:00 | 43,0 | 62,0 |
| 32 | 08:15 | 45,3 | 62,8 |
| 33 | 08:30 | 45,7 | 65,2 |
| 34 | 08:45 | 50,2 | 63,8 |
| 35 | 09:00 | 50,7 | 64,5 |
| 36 | 09:15 | 51,0 | 62,9 |
| 37 | 09:30 | 51,1 | 65,1 |
| 38 | 09:45 | 51,2 | 64,3 |
| 39 | 10:00 | 48,8 | 63,6 |
| 40 | 10:15 | 49,6 | 65,6 |
| 41 | 10:30 | 48,8 | 64,7 |
| 42 | 10:45 | 49,6 | 66,6 |
| 43 | 11:00 | 49,5 | 65,1 |
| 44 | 11:15 | 48,8 | 62,8 |
| 45 | 11:30 | 49,9 | 64,3 |
| 46 | 11:45 | 51,0 | 65,6 |
| 47 | 12:00 | 48,5 | 62,1 |
| 48 | 12:15 | 47,4 | 65,7 |
| 49 | 12:30 | 48,7 | 63,4 |
| 50 | 12:45 | 51,1 | 64,7 |
| 51 | 13:00 | 50,8 | 63,8 |
| 52 | 13:15 | 49,3 | 67,8 |
| 53 | 13:30 | 51,3 | 66,1 |
| 54 | 13:45 | 51,1 | 63,7 |
| 55 | 14:00 | 50,6 | 66,8 |
| 56 | 14:15 | 51,0 | 64,6 |
| 57 | 14:30 | 51,0 | 66,1 |
| 58 | 14:45 | 50,6 | 66,4 |
| 59 | 15:00 | 49,8 | 64,4 |
| 60 | 15:15 | 51,7 | 66,3 |
| 61 | 15:30 | 52,4 | 65,8 |
| 62 | 15:45 | 51,0 | 65,6 |
| 63 | 16:00 | 49,9 | 65,3 |
| 64 | 16:15 | 50,8 | 66,1 |
| 65 | 16:30 | 49,5 | 64,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 66 | 16:45 | 50,2 | 64,1 |
| 67 | 17:00 | 50,4 | 66,1 |
| 68 | 17:15 | 51,0 | 65,2 |
| 69 | 17:30 | 51,2 | 67,2 |
| 70 | 17:45 | 50,4 | 65,6 |
| 71 | 18:00 | 50,0 | 67,0 |
| 72 | 18:15 | 45,3 | 67,4 |
| 73 | 18:30 | 44,1 | 68,0 |
| 74 | 18:45 | 41,1 | 63,9 |
| 75 | 19:00 | 42,3 | 64,9 |
| 76 | 19:15 | 38,3 | 61,1 |
| 77 | 19:30 | 38,6 | 61,1 |
| 78 | 19:45 | 36,0 | 57,0 |
| 79 | 20:00 | 35,3 | 57,6 |
| 80 | 20:15 | 33,5 | 53,7 |
| 81 | 20:30 | 34,8 | 56,7 |
| 82 | 20:45 | 33,4 | 54,8 |
| 83 | 21:00 | 34,7 | 56,1 |
| 84 | 21:15 | 32,8 | 51,2 |
| 85 | 21:30 | 33,3 | 54,0 |
| 86 | 21:45 | 34,0 | 52,1 |
| 87 | 22:00 | 35,3 | 53,9 |
| 88 | 22:15 | 34,7 | 55,1 |
| 89 | 22:30 | 35,8 | 56,1 |
| 90 | 22:45 | 34,2 | 52,3 |
| 91 | 23:00 | 36,9 | 50,8 |
| 92 | 23:15 | 42,4 | 59,8 |
| 93 | 23:30 | 38,5 | 56,2 |
| 94 | 23:45 | 39,4 | 57,8 |
| 95 | 00:00 | 37,4 | 57,8 |
| 96 | 00:15 | 36,3 | 57,1 |

**1.GÜN**
**19-20.09.2022**
**9.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 34,9 | 57,7 |
| 2 | 00:45 | 36,6 | 53,6 |
| 3 | 01:00 | 35,5 | 55,1 |
| 4 | 01:15 | 37,0 | 55,2 |
| 5 | 01:30 | 36,8 | 53,9 |
| 6 | 01:45 | 36,9 | 54,8 |
| 7 | 02:00 | 37,3 | 56,4 |
| 8 | 02:15 | 37,1 | 54,2 |
| 9 | 02:30 | 39,1 | 53,3 |
| 10 | 02:45 | 38,5 | 53,6 |
| 11 | 03:00 | 37,4 | 55,2 |
| 12 | 03:15 | 35,7 | 56,6 |
| 13 | 03:30 | 37,8 | 55,3 |
| 14 | 03:45 | 39,4 | 55,0 |
| 15 | 04:00 | 38,7 | 56,3 |
| 16 | 04:15 | 37,1 | 55,5 |
| 17 | 04:30 | 39,1 | 58,0 |
| 18 | 04:45 | 38,7 | 53,4 |
| 19 | 05:00 | 37,4 | 52,3 |
| 20 | 05:15 | 39,0 | 52,2 |
| 21 | 05:30 | 38,8 | 54,5 |
| 22 | 05:45 | 40,4 | 55,7 |
| 23 | 06:00 | 39,6 | 54,8 |
| 24 | 06:15 | 37,7 | 53,9 |
| 25 | 06:30 | 36,4 | 52,4 |
| 26 | 06:45 | 38,7 | 57,1 |
| 27 | 07:00 | 40,3 | 54,1 |
| 28 | 07:15 | 41,2 | 55,4 |
| 29 | 07:30 | 40,7 | 58,8 |
| 30 | 07:45 | 42,3 | 56,2 |
| 31 | 08:00 | 41,2 | 55,0 |
| 32 | 08:15 | 48,2 | 60,0 |
| 33 | 08:30 | 46,6 | 58,9 |
| 34 | 08:45 | 48,3 | 56,9 |
| 35 | 09:00 | 50,7 | 59,4 |
| 36 | 09:15 | 52,8 | 57,5 |
| 37 | 09:30 | 51,3 | 59,9 |
| 38 | 09:45 | 52,4 | 58,5 |
| 39 | 10:00 | 51,4 | 59,1 |
| 40 | 10:15 | 51,7 | 60,5 |
| 41 | 10:30 | 50,9 | 59,8 |
| 42 | 10:45 | 52,8 | 60,4 |
| 43 | 11:00 | 50,5 | 58,9 |
| 44 | 11:15 | 49,9 | 56,8 |
| 45 | 11:30 | 49,4 | 56,2 |
| 46 | 11:45 | 50,3 | 57,5 |
| 47 | 12:00 | 49,8 | 56,7 |
| 48 | 12:15 | 47,1 | 57,5 |
| 49 | 12:30 | 49,9 | 57,6 |
| 50 | 12:45 | 52,6 | 59,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 51 | 13:00 | 48,8 | 61,2 |
| 52 | 13:15 | 51,4 | 58,0 |
| 53 | 13:30 | 52,7 | 59,9 |
| 54 | 13:45 | 51,1 | 55,9 |
| 55 | 14:00 | 52,4 | 60,9 |
| 56 | 14:15 | 52,7 | 58,8 |
| 57 | 14:30 | 49,9 | 57,9 |
| 58 | 14:45 | 49,3 | 57,6 |
| 59 | 15:00 | 51,0 | 58,5 |
| 60 | 15:15 | 52,4 | 58,8 |
| 61 | 15:30 | 49,4 | 60,0 |
| 62 | 15:45 | 51,5 | 58,0 |
| 63 | 16:00 | 52,4 | 59,4 |
| 64 | 16:15 | 49,8 | 60,4 |
| 65 | 16:30 | 49,0 | 56,0 |
| 66 | 16:45 | 51,7 | 58,0 |
| 67 | 17:00 | 49,7 | 57,3 |
| 68 | 17:15 | 50,4 | 56,3 |
| 69 | 17:30 | 51,3 | 60,0 |
| 70 | 17:45 | 49,4 | 57,8 |
| 71 | 18:00 | 47,0 | 61,8 |
| 72 | 18:15 | 47,1 | 57,4 |
| 73 | 18:30 | 44,9 | 56,7 |
| 74 | 18:45 | 44,4 | 53,0 |
| 75 | 19:00 | 43,8 | 53,9 |
| 76 | 19:15 | 42,9 | 52,7 |
| 77 | 19:30 | 43,2 | 52,4 |
| 78 | 19:45 | 40,4 | 50,7 |
| 79 | 20:00 | 39,1 | 50,2 |
| 80 | 20:15 | 41,2 | 49,4 |
| 81 | 20:30 | 40,2 | 50,3 |
| 82 | 20:45 | 38,9 | 47,8 |
| 83 | 21:00 | 41,3 | 48,3 |
| 84 | 21:15 | 39,1 | 48,8 |
| 85 | 21:30 | 39,0 | 47,0 |
| 86 | 21:45 | 39,3 | 46,5 |
| 87 | 22:00 | 40,3 | 47,2 |
| 88 | 22:15 | 39,2 | 46,5 |
| 89 | 22:30 | 39,5 | 45,8 |
| 90 | 22:45 | 42,5 | 45,9 |
| 91 | 23:00 | 41,0 | 49,8 |
| 92 | 23:15 | 42,6 | 50,3 |
| 93 | 23:30 | 40,5 | 51,0 |
| 94 | 23:45 | 40,9 | 48,9 |
| 95 | 00:00 | 40,8 | 48,3 |
| 96 | 00:15 | 38,3 | 49,0 |

**1.GÜN**
**19-20.09.2022**
**10.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,2 | 54,5 |
| 2 | 00:45 | 40,3 | 59,6 |
| 3 | 01:00 | 41,9 | 60,1 |
| 4 | 01:15 | 42,7 | 61,3 |
| 5 | 01:30 | 45,1 | 59,4 |
| 6 | 01:45 | 44,1 | 62,5 |
| 7 | 02:00 | 42,2 | 57,3 |
| 8 | 02:15 | 47,2 | 65,1 |
| 9 | 02:30 | 44,5 | 58,8 |
| 10 | 02:45 | 44,0 | 57,0 |
| 11 | 03:00 | 45,1 | 58,2 |
| 12 | 03:15 | 46,9 | 60,5 |
| 13 | 03:30 | 45,3 | 60,8 |
| 14 | 03:45 | 43,1 | 58,7 |
| 15 | 04:00 | 44,9 | 58,5 |
| 16 | 04:15 | 41,8 | 57,8 |
| 17 | 04:30 | 46,0 | 59,3 |
| 18 | 04:45 | 42,4 | 57,2 |
| 19 | 05:00 | 43,8 | 62,7 |
| 20 | 05:15 | 42,5 | 58,8 |
| 21 | 05:30 | 42,8 | 57,0 |
| 22 | 05:45 | 41,5 | 56,9 |
| 23 | 06:00 | 38,5 | 56,9 |
| 24 | 06:15 | 40,2 | 52,9 |
| 25 | 06:30 | 41,5 | 53,9 |
| 26 | 06:45 | 43,0 | 57,0 |
| 27 | 07:00 | 46,2 | 59,1 |
| 28 | 07:15 | 46,1 | 61,0 |
| 29 | 07:30 | 47,6 | 58,2 |
| 30 | 07:45 | 49,8 | 58,9 |
| 31 | 08:00 | 50,1 | 61,2 |
| 32 | 08:15 | 53,0 | 64,5 |
| 33 | 08:30 | 53,1 | 61,3 |
| 34 | 08:45 | 54,2 | 61,6 |
| 35 | 09:00 | 55,3 | 64,9 |
| 36 | 09:15 | 57,2 | 66,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 37 | 09:30 | 55,7 | 61,9 |
| 38 | 09:45 | 53,0 | 58,9 |
| 39 | 10:00 | 53,3 | 56,5 |
| 40 | 10:15 | 53,4 | 61,4 |
| 41 | 10:30 | 54,1 | 63,7 |
| 42 | 10:45 | 51,6 | 61,0 |
| 43 | 11:00 | 52,6 | 59,8 |
| 44 | 11:15 | 52,9 | 61,3 |
| 45 | 11:30 | 51,9 | 63,2 |
| 46 | 11:45 | 52,9 | 62,9 |
| 47 | 12:00 | 49,4 | 58,5 |
| 48 | 12:15 | 51,8 | 59,2 |
| 49 | 12:30 | 49,8 | 59,6 |
| 50 | 12:45 | 50,8 | 57,3 |
| 51 | 13:00 | 52,7 | 61,1 |
| 52 | 13:15 | 52,0 | 62,9 |
| 53 | 13:30 | 53,8 | 61,8 |
| 54 | 13:45 | 51,9 | 59,1 |
| 55 | 14:00 | 52,1 | 58,4 |
| 56 | 14:15 | 53,8 | 59,9 |
| 57 | 14:30 | 55,6 | 62,3 |
| 58 | 14:45 | 51,2 | 59,0 |
| 59 | 15:00 | 53,5 | 66,2 |
| 60 | 15:15 | 53,8 | 62,3 |
| 61 | 15:30 | 54,0 | 61,7 |
| 62 | 15:45 | 51,0 | 58,9 |
| 63 | 16:00 | 51,7 | 61,0 |
| 64 | 16:15 | 54,0 | 62,5 |
| 65 | 16:30 | 51,1 | 60,4 |
| 66 | 16:45 | 50,4 | 59,2 |
| 67 | 17:00 | 51,9 | 61,8 |
| 68 | 17:15 | 53,2 | 61,1 |
| 69 | 17:30 | 53,5 | 65,9 |
| 70 | 17:45 | 51,1 | 62,3 |
| 71 | 18:00 | 51,5 | 65,7 |
| 72 | 18:15 | 52,7 | 68,5 |
| 73 | 18:30 | 51,3 | 63,2 |
| 74 | 18:45 | 51,5 | 65,1 |
| 75 | 19:00 | 52,2 | 67,6 |
| 76 | 19:15 | 51,4 | 62,9 |
| 77 | 19:30 | 53,9 | 68,7 |
| 78 | 19:45 | 53,3 | 66,8 |
| 79 | 20:00 | 47,3 | 64,5 |
| 80 | 20:15 | 48,0 | 63,2 |
| 81 | 20:30 | 46,6 | 61,2 |
| 82 | 20:45 | 43,7 | 60,1 |
| 83 | 21:00 | 44,5 | 61,4 |
| 84 | 21:15 | 43,5 | 62,1 |
| 85 | 21:30 | 44,4 | 61,7 |
| 86 | 21:45 | 42,2 | 61,9 |
| 87 | 22:00 | 41,2 | 61,3 |
| 88 | 22:15 | 44,2 | 60,8 |
| 89 | 22:30 | 43,1 | 56,3 |
| 90 | 22:45 | 46,5 | 57,6 |
| 91 | 23:00 | 41,9 | 55,2 |
| 92 | 23:15 | 40,3 | 57,2 |
| 93 | 23:30 | 41,0 | 55,1 |
| 94 | 23:45 | 39,5 | 51,1 |
| 95 | 00:00 | 40,0 | 53,4 |
| 96 | 00:15 | 40,8 | 56,3 |

**1.GÜN**
**19-20.09.2022**
**11.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,7 | 57,0 |
| 2 | 00:45 | 44,4 | 60,0 |
| 3 | 01:00 | 45,6 | 61,5 |
| 4 | 01:15 | 42,9 | 61,0 |
| 5 | 01:30 | 45,9 | 62,1 |
| 6 | 01:45 | 42,4 | 59,2 |
| 7 | 02:00 | 43,1 | 59,7 |
| 8 | 02:15 | 45,1 | 58,2 |
| 9 | 02:30 | 44,8 | 62,1 |
| 10 | 02:45 | 42,5 | 54,7 |
| 11 | 03:00 | 43,5 | 57,2 |
| 12 | 03:15 | 45,5 | 60,0 |
| 13 | 03:30 | 40,2 | 52,8 |
| 14 | 03:45 | 40,0 | 53,8 |
| 15 | 04:00 | 40,5 | 56,4 |
| 16 | 04:15 | 39,2 | 56,4 |
| 17 | 04:30 | 43,9 | 61,4 |
| 18 | 04:45 | 43,7 | 59,9 |
| 19 | 05:00 | 44,5 | 58,0 |
| 20 | 05:15 | 44,8 | 60,3 |
| 21 | 05:30 | 43,1 | 56,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 22 | 05:45 | 42,2 | 54,6 |
| 23 | 06:00 | 42,9 | 52,3 |
| 24 | 06:15 | 41,7 | 56,4 |
| 25 | 06:30 | 45,1 | 57,0 |
| 26 | 06:45 | 43,0 | 59,5 |
| 27 | 07:00 | 42,0 | 58,5 |
| 28 | 07:15 | 46,8 | 64,2 |
| 29 | 07:30 | 46,8 | 56,8 |
| 30 | 07:45 | 48,5 | 59,3 |
| 31 | 08:00 | 49,5 | 58,1 |
| 32 | 08:15 | 50,8 | 62,6 |
| 33 | 08:30 | 52,8 | 64,2 |
| 34 | 08:45 | 50,4 | 64,9 |
| 35 | 09:00 | 51,6 | 63,1 |
| 36 | 09:15 | 50,7 | 65,0 |
| 37 | 09:30 | 50,3 | 62,4 |
| 38 | 09:45 | 50,8 | 59,8 |
| 39 | 10:00 | 48,6 | 55,8 |
| 40 | 10:15 | 50,2 | 59,6 |
| 41 | 10:30 | 52,5 | 58,5 |
| 42 | 10:45 | 49,8 | 57,4 |
| 43 | 11:00 | 50,8 | 58,1 |
| 44 | 11:15 | 49,2 | 58,2 |
| 45 | 11:30 | 51,6 | 59,0 |
| 46 | 11:45 | 49,4 | 54,7 |
| 47 | 12:00 | 49,8 | 56,3 |
| 48 | 12:15 | 47,8 | 57,3 |
| 49 | 12:30 | 49,4 | 55,7 |
| 50 | 12:45 | 47,6 | 58,1 |
| 51 | 13:00 | 51,6 | 65,1 |
| 52 | 13:15 | 48,9 | 59,1 |
| 53 | 13:30 | 52,5 | 62,8 |
| 54 | 13:45 | 48,6 | 57,7 |
| 55 | 14:00 | 52,4 | 62,2 |
| 56 | 14:15 | 52,3 | 57,3 |
| 57 | 14:30 | 52,1 | 63,8 |
| 58 | 14:45 | 47,4 | 59,2 |
| 59 | 15:00 | 50,6 | 62,4 |
| 60 | 15:15 | 49,2 | 62,4 |
| 61 | 15:30 | 50,2 | 59,8 |
| 62 | 15:45 | 47,1 | 54,9 |
| 63 | 16:00 | 49,8 | 54,3 |
| 64 | 16:15 | 50,2 | 59,1 |
| 65 | 16:30 | 47,1 | 59,5 |
| 66 | 16:45 | 48,6 | 58,3 |
| 67 | 17:00 | 46,5 | 61,4 |
| 68 | 17:15 | 47,4 | 59,8 |
| 69 | 17:30 | 48,7 | 61,3 |
| 70 | 17:45 | 49,6 | 60,6 |
| 71 | 18:00 | 45,0 | 57,9 |
| 72 | 18:15 | 47,7 | 62,3 |
| 73 | 18:30 | 48,3 | 61,2 |
| 74 | 18:45 | 45,7 | 57,8 |
| 75 | 19:00 | 48,1 | 66,2 |
| 76 | 19:15 | 46,2 | 63,2 |
| 77 | 19:30 | 48,0 | 60,7 |
| 78 | 19:45 | 49,8 | 60,6 |
| 79 | 20:00 | 46,9 | 57,4 |
| 80 | 20:15 | 45,4 | 58,5 |
| 81 | 20:30 | 45,0 | 52,1 |
| 82 | 20:45 | 41,6 | 53,8 |
| 83 | 21:00 | 46,8 | 54,1 |
| 84 | 21:15 | 43,7 | 54,3 |
| 85 | 21:30 | 46,8 | 57,3 |
| 86 | 21:45 | 44,3 | 57,4 |
| 87 | 22:00 | 43,5 | 55,3 |
| 88 | 22:15 | 43,3 | 59,0 |
| 89 | 22:30 | 44,2 | 59,3 |
| 90 | 22:45 | 45,9 | 59,3 |
| 91 | 23:00 | 44,5 | 59,3 |
| 92 | 23:15 | 45,6 | 55,7 |
| 93 | 23:30 | 43,4 | 55,9 |
| 94 | 23:45 | 45,9 | 57,3 |
| 95 | 00:00 | 43,0 | 57,2 |
| 96 | 00:15 | 45,1 | 53,1 |

**1.GÜN**
**19-20.09.2022**
**12.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,4 | 54,8 |
| 2 | 00:45 | 37,1 | 55,6 |
| 3 | 01:00 | 39,2 | 57,4 |
| 4 | 01:15 | 40,4 | 57,7 |
| 5 | 01:30 | 41,2 | 59,4 |
| 6 | 01:45 | 41,2 | 59,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 7 | 02:00 | 41,5 | 60,0 | 51 | 13:00 | 59,5 | 75,9 |
| 8 | 02:15 | 41,4 | 58,0 | 52 | 13:15 | 59,6 | 77,8 |
| 9 | 02:30 | 38,4 | 55,6 | 53 | 13:30 | 57,1 | 72,3 |
| 10 | 02:45 | 39,6 | 58,0 | 54 | 13:45 | 58,6 | 74,8 |
| 11 | 03:00 | 41,3 | 60,2 | 55 | 14:00 | 57,7 | 75,3 |
| 12 | 03:15 | 40,2 | 60,0 | 56 | 14:15 | 55,4 | 74,1 |
| 13 | 03:30 | 40,7 | 58,8 | 57 | 14:30 | 55,3 | 75,6 |
| 14 | 03:45 | 39,5 | 57,6 | 58 | 14:45 | 58,6 | 75,4 |
| 15 | 04:00 | 39,5 | 59,8 | 59 | 15:00 | 58,6 | 76,9 |
| 16 | 04:15 | 40,3 | 57,7 | 60 | 15:15 | 58,1 | 73,8 |
| 17 | 04:30 | 36,6 | 53,0 | 61 | 15:30 | 60,4 | 75,4 |
| 18 | 04:45 | 38,4 | 54,2 | 62 | 15:45 | 59,5 | 76,2 |
| 19 | 05:00 | 39,2 | 53,4 | 63 | 16:00 | 60,4 | 78,0 |
| 20 | 05:15 | 37,9 | 55,8 | 64 | 16:15 | 60,0 | 75,5 |
| 21 | 05:30 | 38,0 | 55,2 | 65 | 16:30 | 59,5 | 72,9 |
| 22 | 05:45 | 38,6 | 54,8 | 66 | 16:45 | 56,0 | 74,7 |
| 23 | 06:00 | 35,9 | 51,1 | 67 | 17:00 | 56,5 | 75,5 |
| 24 | 06:15 | 36,1 | 53,3 | 68 | 17:15 | 57,1 | 72,6 |
| 25 | 06:30 | 36,6 | 51,7 | 69 | 17:30 | 58,4 | 76,2 |
| 26 | 06:45 | 36,1 | 53,3 | 70 | 17:45 | 59,0 | 77,4 |
| 27 | 07:00 | 44,4 | 61,2 | 71 | 18:00 | 58,4 | 76,2 |
| 28 | 07:15 | 45,7 | 63,2 | 72 | 18:15 | 51,2 | 69,1 |
| 29 | 07:30 | 44,4 | 61,4 | 73 | 18:30 | 49,2 | 70,8 |
| 30 | 07:45 | 44,9 | 62,3 | 74 | 18:45 | 45,7 | 64,0 |
| 31 | 08:00 | 44,9 | 62,5 | 75 | 19:00 | 44,4 | 65,2 |
| 32 | 08:15 | 46,7 | 63,5 | 76 | 19:15 | 39,8 | 60,7 |
| 33 | 08:30 | 47,9 | 66,2 | 77 | 19:30 | 38,8 | 56,6 |
| 34 | 08:45 | 53,8 | 71,1 | 78 | 19:45 | 39,1 | 59,4 |
| 35 | 09:00 | 55,6 | 73,3 | 79 | 20:00 | 39,2 | 59,9 |
| 36 | 09:15 | 55,1 | 73,6 | 80 | 20:15 | 38,8 | 60,7 |
| 37 | 09:30 | 55,0 | 73,3 | 81 | 20:30 | 38,8 | 59,6 |
| 38 | 09:45 | 54,5 | 73,1 | 82 | 20:45 | 39,1 | 58,4 |
| 39 | 10:00 | 53,9 | 67,5 | 83 | 21:00 | 38,6 | 58,3 |
| 40 | 10:15 | 53,6 | 70,5 | 84 | 21:15 | 38,3 | 55,4 |
| 41 | 10:30 | 54,1 | 68,3 | 85 | 21:30 | 37,3 | 54,1 |
| 42 | 10:45 | 55,4 | 72,4 | 86 | 21:45 | 40,0 | 56,8 |
| 43 | 11:00 | 53,4 | 69,7 | 87 | 22:00 | 39,1 | 57,6 |
| 44 | 11:15 | 54,6 | 70,3 | 88 | 22:15 | 40,2 | 59,5 |
| 45 | 11:30 | 55,6 | 71,2 | 89 | 22:30 | 41,5 | 59,8 |
| 46 | 11:45 | 56,4 | 73,2 | 90 | 22:45 | 39,5 | 55,7 |
| 47 | 12:00 | 53,4 | 68,2 | 91 | 23:00 | 42,7 | 60,0 |
| 48 | 12:15 | 53,2 | 70,0 | 92 | 23:15 | 44,4 | 66,7 |
| 49 | 12:30 | 54,6 | 70,7 | 93 | 23:30 | 44,0 | 63,7 |
| 50 | 12:45 | 60,7 | 75,4 | 94 | 23:45 | 42,0 | 65,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 95 | 00:00 | 43,1 | 64,2 |
| 96 | 00:15 | 42,8 | 63,5 |

**1.GÜN**
**19-20.09.2022**
**13.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,1 | 56,7 |
| 2 | 00:45 | 40,9 | 55,3 |
| 3 | 01:00 | 40,1 | 58,9 |
| 4 | 01:15 | 42,7 | 64,2 |
| 5 | 01:30 | 43,8 | 60,6 |
| 6 | 01:45 | 46,2 | 59,1 |
| 7 | 02:00 | 45,6 | 56,2 |
| 8 | 02:15 | 43,8 | 63,6 |
| 9 | 02:30 | 42,1 | 56,4 |
| 10 | 02:45 | 43,7 | 58,8 |
| 11 | 03:00 | 43,8 | 53,4 |
| 12 | 03:15 | 43,5 | 56,0 |
| 13 | 03:30 | 43,9 | 59,1 |
| 14 | 03:45 | 43,5 | 61,1 |
| 15 | 04:00 | 43,7 | 57,1 |
| 16 | 04:15 | 43,9 | 59,0 |
| 17 | 04:30 | 43,4 | 60,8 |
| 18 | 04:45 | 41,7 | 61,4 |
| 19 | 05:00 | 43,7 | 56,4 |
| 20 | 05:15 | 43,3 | 56,1 |
| 21 | 05:30 | 43,0 | 54,0 |
| 22 | 05:45 | 41,2 | 53,6 |
| 23 | 06:00 | 38,5 | 53,4 |
| 24 | 06:15 | 38,0 | 49,9 |
| 25 | 06:30 | 39,9 | 51,0 |
| 26 | 06:45 | 39,5 | 48,1 |
| 27 | 07:00 | 41,4 | 58,0 |
| 28 | 07:15 | 41,0 | 54,2 |
| 29 | 07:30 | 44,1 | 56,3 |
| 30 | 07:45 | 47,6 | 56,8 |
| 31 | 08:00 | 47,8 | 53,3 |
| 32 | 08:15 | 51,3 | 55,8 |
| 33 | 08:30 | 49,7 | 53,2 |
| 34 | 08:45 | 50,9 | 56,0 |
| 35 | 09:00 | 52,3 | 57,1 |
| 36 | 09:15 | 51,3 | 59,0 |
| 37 | 09:30 | 51,7 | 60,7 |
| 38 | 09:45 | 52,1 | 61,9 |
| 39 | 10:00 | 51,4 | 61,6 |
| 40 | 10:15 | 51,2 | 58,4 |
| 41 | 10:30 | 51,7 | 59,8 |
| 42 | 10:45 | 52,3 | 58,4 |
| 43 | 11:00 | 51,2 | 61,2 |
| 44 | 11:15 | 50,7 | 61,7 |
| 45 | 11:30 | 49,3 | 61,8 |
| 46 | 11:45 | 51,4 | 61,1 |
| 47 | 12:00 | 52,5 | 60,5 |
| 48 | 12:15 | 49,2 | 59,1 |
| 49 | 12:30 | 49,3 | 58,3 |
| 50 | 12:45 | 49,9 | 58,9 |
| 51 | 13:00 | 49,0 | 60,5 |
| 52 | 13:15 | 51,0 | 59,2 |
| 53 | 13:30 | 50,8 | 61,0 |
| 54 | 13:45 | 49,4 | 61,9 |
| 55 | 14:00 | 49,8 | 60,0 |
| 56 | 14:15 | 48,7 | 59,4 |
| 57 | 14:30 | 51,4 | 56,2 |
| 58 | 14:45 | 51,7 | 57,8 |
| 59 | 15:00 | 52,1 | 59,9 |
| 60 | 15:15 | 50,7 | 63,8 |
| 61 | 15:30 | 52,2 | 63,9 |
| 62 | 15:45 | 51,9 | 57,7 |
| 63 | 16:00 | 52,4 | 62,2 |
| 64 | 16:15 | 51,6 | 59,8 |
| 65 | 16:30 | 50,4 | 59,4 |
| 66 | 16:45 | 51,0 | 58,6 |
| 67 | 17:00 | 51,8 | 59,3 |
| 68 | 17:15 | 51,3 | 56,7 |
| 69 | 17:30 | 51,7 | 61,4 |
| 70 | 17:45 | 50,7 | 62,8 |
| 71 | 18:00 | 52,2 | 60,9 |
| 72 | 18:15 | 52,0 | 60,3 |
| 73 | 18:30 | 52,3 | 65,2 |
| 74 | 18:45 | 53,4 | 64,6 |
| 75 | 19:00 | 52,8 | 62,5 |
| 76 | 19:15 | 50,5 | 55,4 |
| 77 | 19:30 | 51,1 | 61,2 |
| 78 | 19:45 | 52,8 | 65,2 |
| 79 | 20:00 | 51,2 | 59,9 |
| 80 | 20:15 | 47,0 | 61,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 81 | 20:30 | 43,9 | 63,1 |
| 82 | 20:45 | 41,6 | 59,2 |
| 83 | 21:00 | 41,1 | 53,4 |
| 84 | 21:15 | 40,5 | 53,8 |
| 85 | 21:30 | 40,9 | 55,9 |
| 86 | 21:45 | 40,3 | 55,3 |
| 87 | 22:00 | 40,3 | 53,7 |
| 88 | 22:15 | 41,6 | 56,1 |
| 89 | 22:30 | 41,7 | 57,8 |
| 90 | 22:45 | 40,3 | 58,5 |
| 91 | 23:00 | 41,1 | 56,4 |
| 92 | 23:15 | 42,4 | 56,8 |
| 93 | 23:30 | 40,0 | 59,7 |
| 94 | 23:45 | 39,0 | 56,7 |
| 95 | 00:00 | 40,5 | 60,2 |
| 96 | 00:15 | 38,7 | 57,3 |

**1.GÜN**
**19-20.09.2022**
**14.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,6 | 50,2 |
| 2 | 00:45 | 40,4 | 47,6 |
| 3 | 01:00 | 40,6 | 48,5 |
| 4 | 01:15 | 36,7 | 43,8 |
| 5 | 01:30 | 38,5 | 45,7 |
| 6 | 01:45 | 36,8 | 44,6 |
| 7 | 02:00 | 37,8 | 46,4 |
| 8 | 02:15 | 41,3 | 49,7 |
| 9 | 02:30 | 38,2 | 45,6 |
| 10 | 02:45 | 38,0 | 45,6 |
| 11 | 03:00 | 37,9 | 43,2 |
| 12 | 03:15 | 38,7 | 46,0 |
| 13 | 03:30 | 39,4 | 46,9 |
| 14 | 03:45 | 38,7 | 45,5 |
| 15 | 04:00 | 39,8 | 46,9 |
| 16 | 04:15 | 38,7 | 45,4 |
| 17 | 04:30 | 40,0 | 47,7 |
| 18 | 04:45 | 37,1 | 43,5 |
| 19 | 05:00 | 40,4 | 47,8 |
| 20 | 05:15 | 37,7 | 45,6 |
| 21 | 05:30 | 39,6 | 46,9 |
| 22 | 05:45 | 37,0 | 45,5 |
| 23 | 06:00 | 36,2 | 42,7 |
| 24 | 06:15 | 36,9 | 44,2 |
| 25 | 06:30 | 39,6 | 47,6 |
| 26 | 06:45 | 37,7 | 46,7 |
| 27 | 07:00 | 39,8 | 46,8 |
| 28 | 07:15 | 41,4 | 48,1 |
| 29 | 07:30 | 41,9 | 49,5 |
| 30 | 07:45 | 44,2 | 49,1 |
| 31 | 08:00 | 43,7 | 50,3 |
| 32 | 08:15 | 45,1 | 52,1 |
| 33 | 08:30 | 45,6 | 50,3 |
| 34 | 08:45 | 46,9 | 53,5 |
| 35 | 09:00 | 47,8 | 55,4 |
| 36 | 09:15 | 48,5 | 57,9 |
| 37 | 09:30 | 49,9 | 57,7 |
| 38 | 09:45 | 48,5 | 53,5 |
| 39 | 10:00 | 47,0 | 53,7 |
| 40 | 10:15 | 50,2 | 56,9 |
| 41 | 10:30 | 50,4 | 55,8 |
| 42 | 10:45 | 47,6 | 52,9 |
| 43 | 11:00 | 48,7 | 53,1 |
| 44 | 11:15 | 49,7 | 56,1 |
| 45 | 11:30 | 51,0 | 55,5 |
| 46 | 11:45 | 48,7 | 58,4 |
| 47 | 12:00 | 47,5 | 52,9 |
| 48 | 12:15 | 50,3 | 56,5 |
| 49 | 12:30 | 50,6 | 56,1 |
| 50 | 12:45 | 50,5 | 54,4 |
| 51 | 13:00 | 49,2 | 56,2 |
| 52 | 13:15 | 49,4 | 54,9 |
| 53 | 13:30 | 50,7 | 57,2 |
| 54 | 13:45 | 50,0 | 55,9 |
| 55 | 14:00 | 48,4 | 54,6 |
| 56 | 14:15 | 50,1 | 54,6 |
| 57 | 14:30 | 51,6 | 58,6 |
| 58 | 14:45 | 50,3 | 55,2 |
| 59 | 15:00 | 49,8 | 56,6 |
| 60 | 15:15 | 52,0 | 57,6 |
| 61 | 15:30 | 52,5 | 59,8 |
| 62 | 15:45 | 50,0 | 55,2 |
| 63 | 16:00 | 50,7 | 54,7 |
| 64 | 16:15 | 51,5 | 58,7 |
| 65 | 16:30 | 49,7 | 56,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 66 | 16:45 | 47,6 | 53,1 |
| 67 | 17:00 | 47,9 | 54,2 |
| 68 | 17:15 | 51,0 | 55,5 |
| 69 | 17:30 | 48,6 | 58,2 |
| 70 | 17:45 | 49,5 | 59,4 |
| 71 | 18:00 | 50,7 | 60,8 |
| 72 | 18:15 | 49,4 | 57,9 |
| 73 | 18:30 | 46,8 | 53,6 |
| 74 | 18:45 | 46,9 | 55,7 |
| 75 | 19:00 | 48,6 | 55,3 |
| 76 | 19:15 | 47,1 | 55,3 |
| 77 | 19:30 | 48,4 | 56,9 |
| 78 | 19:45 | 48,7 | 56,6 |
| 79 | 20:00 | 46,7 | 53,1 |
| 80 | 20:15 | 46,6 | 52,5 |
| 81 | 20:30 | 42,1 | 51,0 |
| 82 | 20:45 | 42,3 | 50,8 |
| 83 | 21:00 | 43,1 | 50,8 |
| 84 | 21:15 | 42,6 | 49,4 |
| 85 | 21:30 | 45,0 | 52,6 |
| 86 | 21:45 | 43,3 | 51,0 |
| 87 | 22:00 | 41,0 | 47,9 |
| 88 | 22:15 | 43,3 | 51,0 |
| 89 | 22:30 | 40,7 | 47,9 |
| 90 | 22:45 | 43,2 | 51,0 |
| 91 | 23:00 | 41,8 | 51,6 |
| 92 | 23:15 | 43,5 | 51,9 |
| 93 | 23:30 | 39,4 | 47,9 |
| 94 | 23:45 | 41,9 | 49,1 |
| 95 | 00:00 | 40,3 | 47,4 |
| 96 | 00:15 | 41,8 | 51,6 |

**1.GÜN**
**19-20.09.2022**
**15.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,5 | 49,9 |
| 2 | 00:45 | 42,5 | 54,5 |
| 3 | 01:00 | 40,0 | 54,5 |
| 4 | 01:15 | 39,9 | 53,1 |
| 5 | 01:30 | 42,2 | 54,5 |
| 6 | 01:45 | 41,0 | 53,6 |
| 7 | 02:00 | 40,5 | 51,4 |
| 8 | 02:15 | 43,6 | 55,3 |
| 9 | 02:30 | 41,5 | 52,9 |
| 10 | 02:45 | 40,4 | 52,4 |
| 11 | 03:00 | 43,5 | 56,9 |
| 12 | 03:15 | 44,9 | 58,2 |
| 13 | 03:30 | 43,6 | 57,7 |
| 14 | 03:45 | 43,4 | 56,6 |
| 15 | 04:00 | 44,8 | 59,4 |
| 16 | 04:15 | 41,1 | 55,1 |
| 17 | 04:30 | 46,0 | 56,7 |
| 18 | 04:45 | 43,3 | 54,9 |
| 19 | 05:00 | 47,0 | 59,9 |
| 20 | 05:15 | 41,4 | 53,6 |
| 21 | 05:30 | 43,9 | 56,9 |
| 22 | 05:45 | 42,0 | 53,4 |
| 23 | 06:00 | 39,5 | 50,8 |
| 24 | 06:15 | 40,9 | 54,0 |
| 25 | 06:30 | 44,5 | 56,5 |
| 26 | 06:45 | 41,2 | 54,4 |
| 27 | 07:00 | 45,9 | 60,4 |
| 28 | 07:15 | 49,4 | 62,0 |
| 29 | 07:30 | 50,4 | 61,6 |
| 30 | 07:45 | 50,9 | 61,6 |
| 31 | 08:00 | 53,4 | 62,6 |
| 32 | 08:15 | 51,5 | 63,1 |
| 33 | 08:30 | 53,2 | 63,1 |
| 34 | 08:45 | 52,4 | 61,7 |
| 35 | 09:00 | 53,5 | 64,7 |
| 36 | 09:15 | 50,9 | 67,1 |
| 37 | 09:30 | 53,0 | 64,4 |
| 38 | 09:45 | 51,3 | 63,2 |
| 39 | 10:00 | 53,3 | 63,6 |
| 40 | 10:15 | 51,4 | 63,7 |
| 41 | 10:30 | 54,5 | 63,8 |
| 42 | 10:45 | 50,7 | 61,7 |
| 43 | 11:00 | 50,5 | 60,7 |
| 44 | 11:15 | 52,6 | 59,9 |
| 45 | 11:30 | 49,5 | 59,7 |
| 46 | 11:45 | 49,7 | 61,7 |
| 47 | 12:00 | 47,6 | 55,1 |
| 48 | 12:15 | 48,0 | 59,6 |
| 49 | 12:30 | 49,3 | 57,4 |
| 50 | 12:45 | 49,4 | 60,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 51 | 13:00 | 53,2 | 63,9 |
| 52 | 13:15 | 52,0 | 64,1 |
| 53 | 13:30 | 54,2 | 63,8 |
| 54 | 13:45 | 50,5 | 63,2 |
| 55 | 14:00 | 52,2 | 59,4 |
| 56 | 14:15 | 52,5 | 62,5 |
| 57 | 14:30 | 52,0 | 63,3 |
| 58 | 14:45 | 48,2 | 58,2 |
| 59 | 15:00 | 54,1 | 63,7 |
| 60 | 15:15 | 51,9 | 63,0 |
| 61 | 15:30 | 52,6 | 61,1 |
| 62 | 15:45 | 49,2 | 59,0 |
| 63 | 16:00 | 50,0 | 59,4 |
| 64 | 16:15 | 53,8 | 62,1 |
| 65 | 16:30 | 49,5 | 60,8 |
| 66 | 16:45 | 49,5 | 58,1 |
| 67 | 17:00 | 50,3 | 61,8 |
| 68 | 17:15 | 46,9 | 59,7 |
| 69 | 17:30 | 50,7 | 61,0 |
| 70 | 17:45 | 51,7 | 62,2 |
| 71 | 18:00 | 48,0 | 65,4 |
| 72 | 18:15 | 47,7 | 65,2 |
| 73 | 18:30 | 46,6 | 64,1 |
| 74 | 18:45 | 44,3 | 59,7 |
| 75 | 19:00 | 45,6 | 59,9 |
| 76 | 19:15 | 44,0 | 57,3 |
| 77 | 19:30 | 48,1 | 60,8 |
| 78 | 19:45 | 48,1 | 59,4 |
| 79 | 20:00 | 45,4 | 56,3 |
| 80 | 20:15 | 43,5 | 54,9 |
| 81 | 20:30 | 44,5 | 55,0 |
| 82 | 20:45 | 38,9 | 50,1 |
| 83 | 21:00 | 40,0 | 51,1 |
| 84 | 21:15 | 39,4 | 49,6 |
| 85 | 21:30 | 44,1 | 53,1 |
| 86 | 21:45 | 41,1 | 54,8 |
| 87 | 22:00 | 41,5 | 51,8 |
| 88 | 22:15 | 42,1 | 52,6 |
| 89 | 22:30 | 39,2 | 52,0 |
| 90 | 22:45 | 41,5 | 55,0 |
| 91 | 23:00 | 39,5 | 51,4 |
| 92 | 23:15 | 41,7 | 53,3 |
| 93 | 23:30 | 40,8 | 53,1 |
| 94 | 23:45 | 39,4 | 50,0 |
| 95 | 00:00 | 36,6 | 52,9 |
| 96 | 00:15 | 37,8 | 53,7 |

**1.GÜN**
**19-20.09.2022**
**16.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,1 | 51,0 |
| 2 | 00:45 | 43,2 | 51,8 |
| 3 | 01:00 | 43,6 | 54,4 |
| 4 | 01:15 | 41,4 | 50,4 |
| 5 | 01:30 | 44,6 | 53,8 |
| 6 | 01:45 | 42,7 | 51,0 |
| 7 | 02:00 | 43,7 | 51,4 |
| 8 | 02:15 | 44,3 | 52,5 |
| 9 | 02:30 | 42,0 | 52,2 |
| 10 | 02:45 | 42,8 | 51,8 |
| 11 | 03:00 | 46,1 | 56,2 |
| 12 | 03:15 | 46,2 | 57,6 |
| 13 | 03:30 | 44,4 | 54,8 |
| 14 | 03:45 | 45,6 | 55,9 |
| 15 | 04:00 | 45,6 | 55,3 |
| 16 | 04:15 | 44,0 | 53,3 |
| 17 | 04:30 | 44,4 | 52,3 |
| 18 | 04:45 | 44,3 | 53,6 |
| 19 | 05:00 | 45,9 | 55,7 |
| 20 | 05:15 | 41,9 | 52,0 |
| 21 | 05:30 | 43,0 | 53,0 |
| 22 | 05:45 | 41,2 | 49,7 |
| 23 | 06:00 | 40,0 | 49,4 |
| 24 | 06:15 | 43,9 | 52,9 |
| 25 | 06:30 | 43,7 | 52,8 |
| 26 | 06:45 | 45,0 | 52,3 |
| 27 | 07:00 | 46,8 | 56,3 |
| 28 | 07:15 | 49,0 | 58,5 |
| 29 | 07:30 | 50,4 | 59,8 |
| 30 | 07:45 | 52,0 | 58,8 |
| 31 | 08:00 | 52,5 | 59,1 |
| 32 | 08:15 | 50,6 | 61,3 |
| 33 | 08:30 | 52,3 | 60,1 |
| 34 | 08:45 | 52,9 | 57,7 |
| 35 | 09:00 | 51,6 | 61,4 |
| 36 | 09:15 | 52,8 | 62,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 37 | 09:30 | 53,0 | 61,3 |
| 38 | 09:45 | 50,6 | 58,1 |
| 39 | 10:00 | 51,8 | 59,9 |
| 40 | 10:15 | 52,5 | 61,4 |
| 41 | 10:30 | 51,9 | 60,7 |
| 42 | 10:45 | 50,6 | 59,4 |
| 43 | 11:00 | 51,0 | 59,1 |
| 44 | 11:15 | 48,4 | 55,6 |
| 45 | 11:30 | 50,7 | 57,1 |
| 46 | 11:45 | 47,9 | 55,4 |
| 47 | 12:00 | 48,1 | 54,1 |
| 48 | 12:15 | 46,1 | 53,5 |
| 49 | 12:30 | 50,6 | 55,8 |
| 50 | 12:45 | 49,4 | 56,7 |
| 51 | 13:00 | 51,7 | 59,2 |
| 52 | 13:15 | 49,9 | 57,0 |
| 53 | 13:30 | 51,2 | 58,5 |
| 54 | 13:45 | 48,4 | 56,8 |
| 55 | 14:00 | 52,2 | 57,9 |
| 56 | 14:15 | 50,4 | 58,3 |
| 57 | 14:30 | 52,1 | 59,1 |
| 58 | 14:45 | 48,7 | 54,2 |
| 59 | 15:00 | 51,5 | 59,0 |
| 60 | 15:15 | 49,9 | 57,1 |
| 61 | 15:30 | 49,4 | 56,1 |
| 62 | 15:45 | 47,2 | 53,4 |
| 63 | 16:00 | 48,1 | 55,5 |
| 64 | 16:15 | 51,2 | 56,3 |
| 65 | 16:30 | 47,7 | 57,2 |
| 66 | 16:45 | 49,6 | 54,6 |
| 67 | 17:00 | 48,2 | 53,8 |
| 68 | 17:15 | 46,9 | 54,0 |
| 69 | 17:30 | 48,6 | 55,3 |
| 70 | 17:45 | 49,3 | 58,7 |
| 71 | 18:00 | 46,0 | 55,6 |
| 72 | 18:15 | 45,4 | 54,9 |
| 73 | 18:30 | 46,7 | 56,7 |
| 74 | 18:45 | 42,6 | 52,0 |
| 75 | 19:00 | 45,7 | 53,8 |
| 76 | 19:15 | 43,9 | 53,4 |
| 77 | 19:30 | 45,6 | 56,8 |
| 78 | 19:45 | 46,2 | 55,6 |
| 79 | 20:00 | 45,6 | 54,7 |
| 80 | 20:15 | 43,9 | 51,9 |
| 81 | 20:30 | 42,8 | 51,5 |
| 82 | 20:45 | 38,8 | 49,6 |
| 83 | 21:00 | 40,5 | 48,9 |
| 84 | 21:15 | 39,3 | 46,4 |
| 85 | 21:30 | 42,4 | 49,6 |
| 86 | 21:45 | 39,4 | 48,7 |
| 87 | 22:00 | 39,7 | 48,3 |
| 88 | 22:15 | 40,5 | 47,1 |
| 89 | 22:30 | 37,7 | 46,6 |
| 90 | 22:45 | 39,8 | 49,4 |
| 91 | 23:00 | 38,0 | 46,1 |
| 92 | 23:15 | 41,8 | 49,8 |
| 93 | 23:30 | 39,5 | 47,2 |
| 94 | 23:45 | 39,4 | 48,6 |
| 95 | 00:00 | 35,8 | 44,1 |
| 96 | 00:15 | 38,3 | 46,1 |

**1.GÜN**
**19-20.09.2022**
**17.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,2 | 62,3 |
| 2 | 00:45 | 41,9 | 57,9 |
| 3 | 01:00 | 40,9 | 59,5 |
| 4 | 01:15 | 42,4 | 59,7 |
| 5 | 01:30 | 42,2 | 58,3 |
| 6 | 01:45 | 42,3 | 59,1 |
| 7 | 02:00 | 42,7 | 60,9 |
| 8 | 02:15 | 42,6 | 58,5 |
| 9 | 02:30 | 39,5 | 57,4 |
| 10 | 02:45 | 40,6 | 57,8 |
| 11 | 03:00 | 42,4 | 59,5 |
| 12 | 03:15 | 41,3 | 61,0 |
| 13 | 03:30 | 41,7 | 59,7 |
| 14 | 03:45 | 40,1 | 59,2 |
| 15 | 04:00 | 40,2 | 60,5 |
| 16 | 04:15 | 40,9 | 59,8 |
| 17 | 04:30 | 37,1 | 52,5 |
| 18 | 04:45 | 38,9 | 57,4 |
| 19 | 05:00 | 39,8 | 56,4 |
| 20 | 05:15 | 39,3 | 56,0 |
| 21 | 05:30 | 39,6 | 58,5 |
| 22 | 05:45 | 40,1 | 55,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 23 | 06:00 | 37,4 | 54,5 |
| 24 | 06:15 | 37,6 | 52,4 |
| 25 | 06:30 | 40,4 | 53,9 |
| 26 | 06:45 | 41,5 | 53,0 |
| 27 | 07:00 | 47,1 | 54,9 |
| 28 | 07:15 | 48,5 | 53,9 |
| 29 | 07:30 | 48,4 | 52,8 |
| 30 | 07:45 | 49,3 | 57,0 |
| 31 | 08:00 | 48,7 | 63,4 |
| 32 | 08:15 | 54,0 | 71,6 |
| 33 | 08:30 | 54,3 | 73,0 |
| 34 | 08:45 | 59,6 | 71,5 |
| 35 | 09:00 | 60,2 | 72,5 |
| 36 | 09:15 | 60,6 | 70,3 |
| 37 | 09:30 | 60,7 | 73,0 |
| 38 | 09:45 | 60,2 | 71,5 |
| 39 | 10:00 | 57,5 | 70,5 |
| 40 | 10:15 | 58,5 | 72,8 |
| 41 | 10:30 | 57,5 | 71,9 |
| 42 | 10:45 | 59,6 | 75,2 |
| 43 | 11:00 | 56,9 | 70,9 |
| 44 | 11:15 | 56,4 | 68,2 |
| 45 | 11:30 | 57,6 | 69,7 |
| 46 | 11:45 | 58,6 | 71,5 |
| 47 | 12:00 | 55,8 | 67,6 |
| 48 | 12:15 | 54,7 | 71,5 |
| 49 | 12:30 | 55,9 | 68,9 |
| 50 | 12:45 | 61,3 | 73,4 |
| 51 | 13:00 | 62,9 | 72,2 |
| 52 | 13:15 | 64,3 | 76,5 |
| 53 | 13:30 | 58,6 | 71,3 |
| 54 | 13:45 | 59,0 | 69,2 |
| 55 | 14:00 | 58,1 | 72,6 |
| 56 | 14:15 | 58,5 | 70,2 |
| 57 | 14:30 | 58,9 | 71,9 |
| 58 | 14:45 | 58,1 | 72,2 |
| 59 | 15:00 | 60,8 | 69,8 |
| 60 | 15:15 | 59,9 | 72,1 |
| 61 | 15:30 | 60,8 | 71,6 |
| 62 | 15:45 | 58,9 | 71,4 |
| 63 | 16:00 | 60,4 | 70,9 |
| 64 | 16:15 | 58,0 | 71,3 |
| 65 | 16:30 | 56,6 | 69,4 |
| 66 | 16:45 | 57,2 | 69,1 |
| 67 | 17:00 | 57,3 | 71,1 |
| 68 | 17:15 | 58,1 | 70,1 |
| 69 | 17:30 | 57,7 | 71,6 |
| 70 | 17:45 | 56,8 | 69,8 |
| 71 | 18:00 | 56,4 | 71,5 |
| 72 | 18:15 | 51,2 | 72,1 |
| 73 | 18:30 | 49,7 | 72,5 |
| 74 | 18:45 | 43,7 | 64,1 |
| 75 | 19:00 | 45,1 | 64,9 |
| 76 | 19:15 | 41,0 | 61,5 |
| 77 | 19:30 | 39,5 | 59,0 |
| 78 | 19:45 | 41,3 | 61,8 |
| 79 | 20:00 | 40,6 | 62,3 |
| 80 | 20:15 | 40,1 | 60,3 |
| 81 | 20:30 | 40,0 | 61,5 |
| 82 | 20:45 | 40,5 | 62,3 |
| 83 | 21:00 | 39,8 | 60,7 |
| 84 | 21:15 | 39,3 | 57,8 |
| 85 | 21:30 | 38,3 | 58,3 |
| 86 | 21:45 | 40,4 | 58,3 |
| 87 | 22:00 | 39,7 | 57,0 |
| 88 | 22:15 | 40,8 | 60,7 |
| 89 | 22:30 | 41,8 | 62,0 |
| 90 | 22:45 | 40,2 | 57,8 |
| 91 | 23:00 | 43,1 | 55,9 |
| 92 | 23:15 | 47,7 | 63,4 |
| 93 | 23:30 | 45,3 | 62,1 |
| 94 | 23:45 | 44,4 | 61,2 |
| 95 | 00:00 | 44,0 | 63,9 |
| 96 | 00:15 | 42,4 | 62,9 |

**1.GÜN**
**22-23.09.2022**
**18.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,8 | 47,1 |
| 2 | 00:45 | 40,4 | 49,8 |
| 3 | 01:00 | 39,5 | 48,5 |
| 4 | 01:15 | 39,0 | 49,4 |
| 5 | 01:30 | 39,7 | 50,0 |
| 6 | 01:45 | 39,7 | 48,5 |
| 7 | 02:00 | 38,4 | 47,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | 02:15 | 41,7 | 50,9 | 52 | 13:15 | 52,3 | 64,2 |
| 9 | 02:30 | 39,6 | 47,5 | 53 | 13:30 | 49,9 | 66,7 |
| 10 | 02:45 | 37,1 | 46,0 | 54 | 13:45 | 51,7 | 63,4 |
| 11 | 03:00 | 38,3 | 47,9 | 55 | 14:00 | 50,7 | 63,0 |
| 12 | 03:15 | 41,7 | 48,3 | 56 | 14:15 | 52,3 | 63,7 |
| 13 | 03:30 | 40,4 | 49,9 | 57 | 14:30 | 50,7 | 67,4 |
| 14 | 03:45 | 39,2 | 48,1 | 58 | 14:45 | 53,1 | 64,4 |
| 15 | 04:00 | 40,1 | 50,3 | 59 | 15:00 | 52,5 | 65,6 |
| 16 | 04:15 | 37,5 | 48,4 | 60 | 15:15 | 50,6 | 68,3 |
| 17 | 04:30 | 39,2 | 49,9 | 61 | 15:30 | 49,9 | 68,0 |
| 18 | 04:45 | 39,8 | 47,9 | 62 | 15:45 | 51,6 | 65,4 |
| 19 | 05:00 | 40,7 | 52,0 | 63 | 16:00 | 51,8 | 66,5 |
| 20 | 05:15 | 40,0 | 48,4 | 64 | 16:15 | 52,0 | 70,3 |
| 21 | 05:30 | 41,6 | 49,2 | 65 | 16:30 | 49,8 | 65,6 |
| 22 | 05:45 | 39,3 | 48,3 | 66 | 16:45 | 51,7 | 64,0 |
| 23 | 06:00 | 38,7 | 47,0 | 67 | 17:00 | 52,3 | 67,2 |
| 24 | 06:15 | 37,6 | 48,0 | 68 | 17:15 | 52,0 | 65,1 |
| 25 | 06:30 | 42,1 | 52,3 | 69 | 17:30 | 51,3 | 63,8 |
| 26 | 06:45 | 39,5 | 49,4 | 70 | 17:45 | 49,5 | 67,7 |
| 27 | 07:00 | 42,2 | 54,8 | 71 | 18:00 | 53,0 | 64,0 |
| 28 | 07:15 | 46,1 | 55,2 | 72 | 18:15 | 48,7 | 63,2 |
| 29 | 07:30 | 46,2 | 55,1 | 73 | 18:30 | 45,4 | 60,0 |
| 30 | 07:45 | 46,6 | 54,6 | 74 | 18:45 | 46,6 | 58,4 |
| 31 | 08:00 | 45,8 | 55,5 | 75 | 19:00 | 45,1 | 58,7 |
| 32 | 08:15 | 48,9 | 55,8 | 76 | 19:15 | 45,5 | 55,1 |
| 33 | 08:30 | 48,3 | 56,7 | 77 | 19:30 | 49,7 | 57,8 |
| 34 | 08:45 | 52,2 | 61,0 | 78 | 19:45 | 50,5 | 59,0 |
| 35 | 09:00 | 53,2 | 62,1 | 79 | 20:00 | 48,6 | 55,9 |
| 36 | 09:15 | 51,6 | 64,1 | 80 | 20:15 | 45,6 | 55,1 |
| 37 | 09:30 | 53,0 | 61,0 | 81 | 20:30 | 46,2 | 53,6 |
| 38 | 09:45 | 49,9 | 59,1 | 82 | 20:45 | 40,3 | 50,2 |
| 39 | 10:00 | 52,1 | 59,9 | 83 | 21:00 | 42,8 | 50,1 |
| 40 | 10:15 | 52,8 | 61,1 | 84 | 21:15 | 39,6 | 48,5 |
| 41 | 10:30 | 50,9 | 61,8 | 85 | 21:30 | 44,5 | 52,8 |
| 42 | 10:45 | 51,5 | 59,4 | 86 | 21:45 | 43,2 | 52,7 |
| 43 | 11:00 | 50,0 | 57,4 | 87 | 22:00 | 43,3 | 51,3 |
| 44 | 11:15 | 50,9 | 59,6 | 88 | 22:15 | 42,8 | 53,2 |
| 45 | 11:30 | 50,6 | 61,4 | 89 | 22:30 | 40,6 | 51,6 |
| 46 | 11:45 | 52,3 | 61,7 | 90 | 22:45 | 43,7 | 54,0 |
| 47 | 12:00 | 50,7 | 57,8 | 91 | 23:00 | 44,6 | 56,6 |
| 48 | 12:15 | 52,0 | 59,0 | 92 | 23:15 | 47,7 | 56,9 |
| 49 | 12:30 | 50,0 | 58,7 | 93 | 23:30 | 45,3 | 56,5 |
| 50 | 12:45 | 53,3 | 59,1 | 94 | 23:45 | 44,8 | 51,5 |
| 51 | 13:00 | 51,5 | 62,7 | 95 | 00:00 | 42,9 | 53,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 96 | 00:15 | 42,4 | 52,0 |

**1.GÜN**
**22-23.09.2022**
**19.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 46,4 | 55,2 |
| 2 | 00:45 | 47,1 | 55,0 |
| 3 | 01:00 | 48,1 | 53,9 |
| 4 | 01:15 | 44,9 | 55,7 |
| 5 | 01:30 | 44,9 | 54,1 |
| 6 | 01:45 | 45,3 | 55,0 |
| 7 | 02:00 | 46,0 | 57,8 |
| 8 | 02:15 | 44,7 | 54,4 |
| 9 | 02:30 | 46,1 | 55,7 |
| 10 | 02:45 | 46,0 | 54,8 |
| 11 | 03:00 | 44,7 | 52,9 |
| 12 | 03:15 | 47,8 | 56,6 |
| 13 | 03:30 | 43,7 | 54,0 |
| 14 | 03:45 | 44,3 | 53,5 |
| 15 | 04:00 | 46,1 | 56,4 |
| 16 | 04:15 | 46,3 | 57,8 |
| 17 | 04:30 | 46,3 | 57,3 |
| 18 | 04:45 | 45,6 | 56,2 |
| 19 | 05:00 | 47,4 | 57,8 |
| 20 | 05:15 | 44,2 | 53,6 |
| 21 | 05:30 | 48,4 | 56,8 |
| 22 | 05:45 | 45,2 | 54,8 |
| 23 | 06:00 | 49,3 | 59,8 |
| 24 | 06:15 | 43,2 | 53,5 |
| 25 | 06:30 | 43,2 | 53,5 |
| 26 | 06:45 | 46,5 | 51,8 |
| 27 | 07:00 | 49,4 | 57,5 |
| 28 | 07:15 | 47,6 | 57,4 |
| 29 | 07:30 | 45,6 | 55,9 |
| 30 | 07:45 | 44,7 | 54,1 |
| 31 | 08:00 | 46,8 | 57,1 |
| 32 | 08:15 | 45,1 | 54,3 |
| 33 | 08:30 | 47,7 | 57,6 |
| 34 | 08:45 | 49,4 | 59,3 |
| 35 | 09:00 | 50,1 | 60,0 |
| 36 | 09:15 | 52,8 | 60,0 |
| 37 | 09:30 | 56,1 | 60,9 |
| 38 | 09:45 | 52,6 | 63,8 |
| 39 | 10:00 | 54,8 | 63,5 |
| 40 | 10:15 | 56,1 | 62,8 |
| 41 | 10:30 | 54,2 | 65,8 |
| 42 | 10:45 | 51,3 | 59,1 |
| 43 | 11:00 | 51,4 | 57,4 |
| 44 | 11:15 | 55,6 | 61,2 |
| 45 | 11:30 | 53,2 | 57,9 |
| 46 | 11:45 | 55,0 | 64,0 |
| 47 | 12:00 | 52,8 | 58,1 |
| 48 | 12:15 | 55,6 | 63,1 |
| 49 | 12:30 | 52,1 | 59,1 |
| 50 | 12:45 | 53,6 | 58,1 |
| 51 | 13:00 | 52,4 | 58,1 |
| 52 | 13:15 | 55,1 | 62,5 |
| 53 | 13:30 | 56,6 | 62,2 |
| 54 | 13:45 | 55,8 | 62,5 |
| 55 | 14:00 | 53,4 | 64,2 |
| 56 | 14:15 | 55,0 | 65,5 |
| 57 | 14:30 | 54,9 | 66,7 |
| 58 | 14:45 | 52,6 | 65,8 |
| 59 | 15:00 | 54,4 | 63,7 |
| 60 | 15:15 | 56,3 | 61,9 |
| 61 | 15:30 | 52,8 | 65,9 |
| 62 | 15:45 | 55,5 | 64,4 |
| 63 | 16:00 | 54,0 | 64,1 |
| 64 | 16:15 | 55,8 | 65,6 |
| 65 | 16:30 | 53,8 | 63,3 |
| 66 | 16:45 | 51,9 | 59,9 |
| 67 | 17:00 | 52,0 | 61,7 |
| 68 | 17:15 | 53,2 | 61,5 |
| 69 | 17:30 | 54,6 | 64,7 |
| 70 | 17:45 | 55,2 | 67,4 |
| 71 | 18:00 | 53,5 | 68,3 |
| 72 | 18:15 | 54,2 | 70,3 |
| 73 | 18:30 | 55,5 | 68,5 |
| 74 | 18:45 | 53,5 | 67,7 |
| 75 | 19:00 | 56,4 | 72,9 |
| 76 | 19:15 | 55,6 | 68,1 |
| 77 | 19:30 | 56,0 | 71,2 |
| 78 | 19:45 | 55,3 | 69,4 |
| 79 | 20:00 | 51,2 | 69,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 80 | 20:15 | 54,5 | 66,4 |
| 81 | 20:30 | 56,1 | 60,5 |
| 82 | 20:45 | 55,2 | 63,7 |
| 83 | 21:00 | 53,3 | 62,1 |
| 84 | 21:15 | 54,1 | 58,8 |
| 85 | 21:30 | 56,1 | 59,5 |
| 86 | 21:45 | 54,8 | 59,5 |
| 87 | 22:00 | 53,2 | 58,3 |
| 88 | 22:15 | 52,1 | 62,2 |
| 89 | 22:30 | 48,9 | 62,9 |
| 90 | 22:45 | 47,9 | 58,3 |
| 91 | 23:00 | 44,1 | 56,5 |
| 92 | 23:15 | 46,5 | 62,2 |
| 93 | 23:30 | 41,2 | 57,3 |
| 94 | 23:45 | 43,5 | 60,9 |
| 95 | 00:00 | 43,3 | 63,3 |
| 96 | 00:15 | 41,9 | 62,7 |

**1.GÜN**
**22-23.09.2022**
**20.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 47,4 | 58,2 |
| 2 | 00:45 | 47,8 | 59,3 |
| 3 | 01:00 | 50,3 | 59,1 |
| 4 | 01:15 | 47,9 | 53,8 |
| 5 | 01:30 | 51,1 | 59,3 |
| 6 | 01:45 | 48,4 | 57,4 |
| 7 | 02:00 | 47,5 | 56,3 |
| 8 | 02:15 | 48,9 | 57,4 |
| 9 | 02:30 | 47,5 | 55,9 |
| 10 | 02:45 | 46,9 | 53,4 |
| 11 | 03:00 | 48,1 | 59,2 |
| 12 | 03:15 | 48,7 | 59,8 |
| 13 | 03:30 | 45,3 | 57,4 |
| 14 | 03:45 | 44,4 | 57,8 |
| 15 | 04:00 | 45,2 | 61,4 |
| 16 | 04:15 | 44,3 | 60,9 |
| 17 | 04:30 | 47,0 | 60,7 |
| 18 | 04:45 | 45,4 | 62,1 |
| 19 | 05:00 | 45,5 | 58,0 |
| 20 | 05:15 | 45,3 | 61,8 |
| 21 | 05:30 | 43,1 | 61,8 |
| 22 | 05:45 | 40,5 | 58,5 |
| 23 | 06:00 | 40,2 | 60,8 |
| 24 | 06:15 | 41,8 | 59,8 |
| 25 | 06:30 | 43,2 | 57,0 |
| 26 | 06:45 | 42,5 | 60,5 |
| 27 | 07:00 | 42,9 | 56,7 |
| 28 | 07:15 | 44,7 | 61,3 |
| 29 | 07:30 | 44,0 | 61,7 |
| 30 | 07:45 | 47,2 | 56,4 |
| 31 | 08:00 | 48,1 | 60,5 |
| 32 | 08:15 | 52,1 | 58,9 |
| 33 | 08:30 | 52,9 | 56,8 |
| 34 | 08:45 | 53,5 | 59,1 |
| 35 | 09:00 | 53,9 | 60,5 |
| 36 | 09:15 | 51,2 | 59,4 |
| 37 | 09:30 | 51,6 | 61,0 |
| 38 | 09:45 | 49,4 | 60,9 |
| 39 | 10:00 | 48,4 | 61,1 |
| 40 | 10:15 | 50,3 | 59,8 |
| 41 | 10:30 | 51,2 | 56,7 |
| 42 | 10:45 | 49,3 | 58,5 |
| 43 | 11:00 | 51,0 | 61,7 |
| 44 | 11:15 | 48,7 | 61,1 |
| 45 | 11:30 | 50,7 | 58,9 |
| 46 | 11:45 | 49,3 | 59,7 |
| 47 | 12:00 | 48,6 | 58,8 |
| 48 | 12:15 | 49,1 | 59,5 |
| 49 | 12:30 | 49,7 | 57,9 |
| 50 | 12:45 | 49,4 | 61,3 |
| 51 | 13:00 | 53,7 | 61,2 |
| 52 | 13:15 | 50,8 | 59,5 |
| 53 | 13:30 | 50,6 | 60,8 |
| 54 | 13:45 | 49,9 | 61,6 |
| 55 | 14:00 | 50,9 | 60,5 |
| 56 | 14:15 | 49,7 | 61,3 |
| 57 | 14:30 | 50,8 | 55,3 |
| 58 | 14:45 | 47,1 | 52,5 |
| 59 | 15:00 | 47,9 | 54,8 |
| 60 | 15:15 | 47,4 | 53,7 |
| 61 | 15:30 | 46,7 | 50,4 |
| 62 | 15:45 | 44,4 | 53,7 |
| 63 | 16:00 | 45,9 | 51,6 |
| 64 | 16:15 | 47,5 | 51,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 65 | 16:30 | 45,4 | 51,0 |
| 66 | 16:45 | 46,0 | 50,3 |
| 67 | 17:00 | 46,7 | 51,0 |
| 68 | 17:15 | 48,1 | 50,1 |
| 69 | 17:30 | 46,6 | 52,7 |
| 70 | 17:45 | 48,8 | 55,9 |
| 71 | 18:00 | 46,4 | 57,1 |
| 72 | 18:15 | 48,1 | 59,0 |
| 73 | 18:30 | 49,1 | 60,6 |
| 74 | 18:45 | 45,3 | 58,0 |
| 75 | 19:00 | 47,9 | 59,8 |
| 76 | 19:15 | 45,7 | 52,8 |
| 77 | 19:30 | 46,1 | 58,5 |
| 78 | 19:45 | 47,9 | 58,4 |
| 79 | 20:00 | 45,6 | 59,8 |
| 80 | 20:15 | 46,1 | 56,2 |
| 81 | 20:30 | 43,8 | 50,7 |
| 82 | 20:45 | 44,0 | 52,8 |
| 83 | 21:00 | 45,3 | 57,1 |
| 84 | 21:15 | 45,0 | 55,2 |
| 85 | 21:30 | 46,3 | 59,1 |
| 86 | 21:45 | 45,0 | 55,8 |
| 87 | 22:00 | 42,7 | 55,6 |
| 88 | 22:15 | 45,3 | 59,3 |
| 89 | 22:30 | 47,9 | 59,5 |
| 90 | 22:45 | 48,8 | 60,0 |
| 91 | 23:00 | 47,0 | 56,7 |
| 92 | 23:15 | 46,8 | 57,0 |
| 93 | 23:30 | 47,4 | 58,2 |
| 94 | 23:45 | 46,0 | 58,0 |
| 95 | 00:00 | 45,4 | 58,7 |
| 96 | 00:15 | 48,2 | 60,8 |

**1.GÜN**
**22-23.09.2022**
**21.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,8 | 51,1 |
| 2 | 00:45 | 43,3 | 51,9 |
| 3 | 01:00 | 43,1 | 52,7 |
| 4 | 01:15 | 42,8 | 51,3 |
| 5 | 01:30 | 43,1 | 52,1 |
| 6 | 01:45 | 42,9 | 51,0 |
| 7 | 02:00 | 42,5 | 52,2 |
| 8 | 02:15 | 43,3 | 51,1 |
| 9 | 02:30 | 43,1 | 49,9 |
| 10 | 02:45 | 41,5 | 51,2 |
| 11 | 03:00 | 41,0 | 50,4 |
| 12 | 03:15 | 42,7 | 49,2 |
| 13 | 03:30 | 41,2 | 51,6 |
| 14 | 03:45 | 41,8 | 49,9 |
| 15 | 04:00 | 41,3 | 51,0 |
| 16 | 04:15 | 41,9 | 52,4 |
| 17 | 04:30 | 42,3 | 53,1 |
| 18 | 04:45 | 43,1 | 51,7 |
| 19 | 05:00 | 42,3 | 51,6 |
| 20 | 05:15 | 42,0 | 51,6 |
| 21 | 05:30 | 39,9 | 49,4 |
| 22 | 05:45 | 39,8 | 49,8 |
| 23 | 06:00 | 39,9 | 48,0 |
| 24 | 06:15 | 40,8 | 49,0 |
| 25 | 06:30 | 41,7 | 50,2 |
| 26 | 06:45 | 42,1 | 49,0 |
| 27 | 07:00 | 41,7 | 48,5 |
| 28 | 07:15 | 44,3 | 52,2 |
| 29 | 07:30 | 45,5 | 51,3 |
| 30 | 07:45 | 48,6 | 54,0 |
| 31 | 08:00 | 49,0 | 54,8 |
| 32 | 08:15 | 46,6 | 52,1 |
| 33 | 08:30 | 49,9 | 53,0 |
| 34 | 08:45 | 50,8 | 56,0 |
| 35 | 09:00 | 51,8 | 58,7 |
| 36 | 09:15 | 51,9 | 59,8 |
| 37 | 09:30 | 52,8 | 58,0 |
| 38 | 09:45 | 53,8 | 59,2 |
| 39 | 10:00 | 53,2 | 56,5 |
| 40 | 10:15 | 52,7 | 58,1 |
| 41 | 10:30 | 52,9 | 59,5 |
| 42 | 10:45 | 52,4 | 60,4 |
| 43 | 11:00 | 53,0 | 59,1 |
| 44 | 11:15 | 54,5 | 60,0 |
| 45 | 11:30 | 55,3 | 60,3 |
| 46 | 11:45 | 53,9 | 62,7 |
| 47 | 12:00 | 54,4 | 59,9 |
| 48 | 12:15 | 54,5 | 61,8 |
| 49 | 12:30 | 53,2 | 60,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 50 | 12:45 | 54,7 | 59,3 |
| 51 | 13:00 | 53,9 | 59,9 |
| 52 | 13:15 | 54,0 | 61,2 |
| 53 | 13:30 | 54,4 | 59,7 |
| 54 | 13:45 | 54,8 | 61,2 |
| 55 | 14:00 | 54,4 | 60,0 |
| 56 | 14:15 | 56,8 | 58,4 |
| 57 | 14:30 | 56,0 | 61,7 |
| 58 | 14:45 | 53,2 | 63,0 |
| 59 | 15:00 | 54,1 | 59,5 |
| 60 | 15:15 | 53,8 | 61,4 |
| 61 | 15:30 | 52,2 | 59,4 |
| 62 | 15:45 | 52,7 | 61,2 |
| 63 | 16:00 | 54,8 | 60,4 |
| 64 | 16:15 | 53,7 | 59,1 |
| 65 | 16:30 | 54,5 | 60,3 |
| 66 | 16:45 | 54,6 | 60,9 |
| 67 | 17:00 | 55,3 | 60,4 |
| 68 | 17:15 | 54,9 | 61,7 |
| 69 | 17:30 | 55,5 | 63,2 |
| 70 | 17:45 | 54,8 | 64,4 |
| 71 | 18:00 | 47,5 | 62,6 |
| 72 | 18:15 | 47,8 | 58,4 |
| 73 | 18:30 | 48,3 | 57,5 |
| 74 | 18:45 | 47,8 | 57,2 |
| 75 | 19:00 | 48,5 | 59,6 |
| 76 | 19:15 | 47,3 | 58,5 |
| 77 | 19:30 | 47,7 | 57,8 |
| 78 | 19:45 | 46,8 | 59,0 |
| 79 | 20:00 | 47,0 | 58,1 |
| 80 | 20:15 | 47,6 | 57,3 |
| 81 | 20:30 | 45,6 | 58,4 |
| 82 | 20:45 | 45,2 | 55,2 |
| 83 | 21:00 | 47,7 | 55,9 |
| 84 | 21:15 | 45,5 | 56,5 |
| 85 | 21:30 | 44,2 | 54,1 |
| 86 | 21:45 | 44,7 | 52,8 |
| 87 | 22:00 | 44,2 | 53,4 |
| 88 | 22:15 | 44,3 | 52,8 |
| 89 | 22:30 | 44,8 | 51,9 |
| 90 | 22:45 | 48,0 | 52,3 |
| 91 | 23:00 | 47,7 | 56,3 |
| 92 | 23:15 | 46,7 | 55,3 |
| 93 | 23:30 | 44,6 | 56,2 |
| 94 | 23:45 | 45,1 | 53,9 |
| 95 | 00:00 | 45,0 | 53,0 |
| 96 | 00:15 | 42,7 | 54,0 |

**1.GÜN**
**22-23.09.2022**
**22.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,9 | 48,1 |
| 2 | 00:45 | 42,5 | 50,8 |
| 3 | 01:00 | 40,8 | 50,8 |
| 4 | 01:15 | 40,7 | 49,5 |
| 5 | 01:30 | 42,2 | 50,8 |
| 6 | 01:45 | 41,9 | 50,0 |
| 7 | 02:00 | 40,9 | 48,0 |
| 8 | 02:15 | 43,5 | 51,6 |
| 9 | 02:30 | 39,8 | 49,3 |
| 10 | 02:45 | 40,4 | 48,9 |
| 11 | 03:00 | 43,4 | 53,1 |
| 12 | 03:15 | 43,5 | 54,3 |
| 13 | 03:30 | 43,5 | 53,9 |
| 14 | 03:45 | 43,0 | 52,8 |
| 15 | 04:00 | 44,8 | 54,3 |
| 16 | 04:15 | 41,5 | 50,3 |
| 17 | 04:30 | 43,9 | 51,8 |
| 18 | 04:45 | 41,4 | 50,1 |
| 19 | 05:00 | 44,9 | 54,7 |
| 20 | 05:15 | 39,5 | 49,0 |
| 21 | 05:30 | 42,0 | 51,9 |
| 22 | 05:45 | 40,3 | 48,8 |
| 23 | 06:00 | 37,5 | 46,4 |
| 24 | 06:15 | 40,9 | 49,2 |
| 25 | 06:30 | 42,8 | 51,6 |
| 26 | 06:45 | 41,2 | 49,6 |
| 27 | 07:00 | 45,9 | 55,2 |
| 28 | 07:15 | 47,5 | 56,6 |
| 29 | 07:30 | 48,4 | 57,5 |
| 30 | 07:45 | 50,8 | 57,5 |
| 31 | 08:00 | 53,9 | 58,4 |
| 32 | 08:15 | 53,3 | 58,9 |
| 33 | 08:30 | 53,1 | 58,9 |
| 34 | 08:45 | 52,9 | 57,6 |
| 35 | 09:00 | 52,6 | 60,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 36 | 09:15 | 56,0 | 62,5 |
| 37 | 09:30 | 52,1 | 60,2 |
| 38 | 09:45 | 50,4 | 59,0 |
| 39 | 10:00 | 51,1 | 59,4 |
| 40 | 10:15 | 52,7 | 59,5 |
| 41 | 10:30 | 52,7 | 59,6 |
| 42 | 10:45 | 49,1 | 57,6 |
| 43 | 11:00 | 48,9 | 56,6 |
| 44 | 11:15 | 48,9 | 55,9 |
| 45 | 11:30 | 49,5 | 55,7 |
| 46 | 11:45 | 49,7 | 57,6 |
| 47 | 12:00 | 45,7 | 51,4 |
| 48 | 12:15 | 48,0 | 55,6 |
| 49 | 12:30 | 47,4 | 53,6 |
| 50 | 12:45 | 49,4 | 56,6 |
| 51 | 13:00 | 50,5 | 59,7 |
| 52 | 13:15 | 52,4 | 59,9 |
| 53 | 13:30 | 52,0 | 59,6 |
| 54 | 13:45 | 50,4 | 59,0 |
| 55 | 14:00 | 50,0 | 55,4 |
| 56 | 14:15 | 50,3 | 58,3 |
| 57 | 14:30 | 51,9 | 59,1 |
| 58 | 14:45 | 48,7 | 54,3 |
| 59 | 15:00 | 51,9 | 59,5 |
| 60 | 15:15 | 51,3 | 58,8 |
| 61 | 15:30 | 50,4 | 57,0 |
| 62 | 15:45 | 48,7 | 55,1 |
| 63 | 16:00 | 48,1 | 55,4 |
| 64 | 16:15 | 51,1 | 56,2 |
| 65 | 16:30 | 49,5 | 55,1 |
| 66 | 16:45 | 47,6 | 52,6 |
| 67 | 17:00 | 50,2 | 55,9 |
| 68 | 17:15 | 46,9 | 54,1 |
| 69 | 17:30 | 48,7 | 55,3 |
| 70 | 17:45 | 49,5 | 56,3 |
| 71 | 18:00 | 49,2 | 59,3 |
| 72 | 18:15 | 48,9 | 59,1 |
| 73 | 18:30 | 47,8 | 58,1 |
| 74 | 18:45 | 44,3 | 54,1 |
| 75 | 19:00 | 46,1 | 54,3 |
| 76 | 19:15 | 43,9 | 53,5 |
| 77 | 19:30 | 46,2 | 56,7 |
| 78 | 19:45 | 46,2 | 55,4 |
| 79 | 20:00 | 43,6 | 52,5 |
| 80 | 20:15 | 43,4 | 51,2 |
| 81 | 20:30 | 42,8 | 51,3 |
| 82 | 20:45 | 39,2 | 46,8 |
| 83 | 21:00 | 38,4 | 47,7 |
| 84 | 21:15 | 39,3 | 46,3 |
| 85 | 21:30 | 42,4 | 49,5 |
| 86 | 21:45 | 41,5 | 51,1 |
| 87 | 22:00 | 39,8 | 48,3 |
| 88 | 22:15 | 42,1 | 49,1 |
| 89 | 22:30 | 39,1 | 48,5 |
| 90 | 22:45 | 41,5 | 51,3 |
| 91 | 23:00 | 39,5 | 48,0 |
| 92 | 23:15 | 40,0 | 49,7 |
| 93 | 23:30 | 40,8 | 49,5 |
| 94 | 23:45 | 37,8 | 46,7 |
| 95 | 00:00 | 36,6 | 45,9 |
| 96 | 00:15 | 37,7 | 45,6 |

**1.GÜN**
**22-23.09.2022**
**23.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 43,3 | 55,7 |
| 2 | 00:45 | 42,1 | 57,3 |
| 3 | 01:00 | 42,4 | 59,4 |
| 4 | 01:15 | 43,7 | 57,1 |
| 5 | 01:30 | 42,6 | 54,5 |
| 6 | 01:45 | 42,5 | 52,5 |
| 7 | 02:00 | 42,4 | 60,0 |
| 8 | 02:15 | 43,4 | 58,1 |
| 9 | 02:30 | 43,3 | 58,4 |
| 10 | 02:45 | 43,3 | 52,9 |
| 11 | 03:00 | 44,8 | 57,7 |
| 12 | 03:15 | 43,8 | 59,2 |
| 13 | 03:30 | 43,9 | 61,8 |
| 14 | 03:45 | 43,6 | 57,1 |
| 15 | 04:00 | 43,5 | 58,5 |
| 16 | 04:15 | 45,3 | 63,5 |
| 17 | 04:30 | 46,6 | 61,2 |
| 18 | 04:45 | 45,7 | 55,6 |
| 19 | 05:00 | 45,1 | 55,2 |
| 20 | 05:15 | 44,8 | 53,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 21 | 05:30 | 42,6 | 52,5 |
| 22 | 05:45 | 42,6 | 55,7 |
| 23 | 06:00 | 41,7 | 51,8 |
| 24 | 06:15 | 43,6 | 52,8 |
| 25 | 06:30 | 43,5 | 49,7 |
| 26 | 06:45 | 43,6 | 57,8 |
| 27 | 07:00 | 43,0 | 54,1 |
| 28 | 07:15 | 46,3 | 55,7 |
| 29 | 07:30 | 48,1 | 54,1 |
| 30 | 07:45 | 44,4 | 55,5 |
| 31 | 08:00 | 44,5 | 56,7 |
| 32 | 08:15 | 44,8 | 57,8 |
| 33 | 08:30 | 49,2 | 56,6 |
| 34 | 08:45 | 49,7 | 57,4 |
| 35 | 09:00 | 49,9 | 55,6 |
| 36 | 09:15 | 50,0 | 57,8 |
| 37 | 09:30 | 49,7 | 56,6 |
| 38 | 09:45 | 47,5 | 55,8 |
| 39 | 10:00 | 48,3 | 57,7 |
| 40 | 10:15 | 47,5 | 56,9 |
| 41 | 10:30 | 49,2 | 59,7 |
| 42 | 10:45 | 47,0 | 56,1 |
| 43 | 11:00 | 46,5 | 54,1 |
| 44 | 11:15 | 47,6 | 55,2 |
| 45 | 11:30 | 48,4 | 56,6 |
| 46 | 11:45 | 46,0 | 53,6 |
| 47 | 12:00 | 45,1 | 56,6 |
| 48 | 12:15 | 46,1 | 54,6 |
| 49 | 12:30 | 50,6 | 58,1 |
| 50 | 12:45 | 51,9 | 57,2 |
| 51 | 13:00 | 53,1 | 60,5 |
| 52 | 13:15 | 52,4 | 61,0 |
| 53 | 13:30 | 52,8 | 59,5 |
| 54 | 13:45 | 52,0 | 62,3 |
| 55 | 14:00 | 52,3 | 60,1 |
| 56 | 14:15 | 52,7 | 61,7 |
| 57 | 14:30 | 52,0 | 62,0 |
| 58 | 14:45 | 54,4 | 60,0 |
| 59 | 15:00 | 53,6 | 61,9 |
| 60 | 15:15 | 54,4 | 61,5 |
| 61 | 15:30 | 52,7 | 61,3 |
| 62 | 15:45 | 54,0 | 60,7 |
| 63 | 16:00 | 51,7 | 61,0 |
| 64 | 16:15 | 50,5 | 59,6 |
| 65 | 16:30 | 51,2 | 59,4 |
| 66 | 16:45 | 51,3 | 60,9 |
| 67 | 17:00 | 51,9 | 60,0 |
| 68 | 17:15 | 52,8 | 62,7 |
| 69 | 17:30 | 51,9 | 61,3 |
| 70 | 17:45 | 51,5 | 58,9 |
| 71 | 18:00 | 49,3 | 61,1 |
| 72 | 18:15 | 50,6 | 63,5 |
| 73 | 18:30 | 51,8 | 56,2 |
| 74 | 18:45 | 51,1 | 56,9 |
| 75 | 19:00 | 49,3 | 60,0 |
| 76 | 19:15 | 52,5 | 63,1 |
| 77 | 19:30 | 52,4 | 64,6 |
| 78 | 19:45 | 53,5 | 59,3 |
| 79 | 20:00 | 44,5 | 58,4 |
| 80 | 20:15 | 46,1 | 62,5 |
| 81 | 20:30 | 44,8 | 55,9 |
| 82 | 20:45 | 46,3 | 52,9 |
| 83 | 21:00 | 45,0 | 52,8 |
| 84 | 21:15 | 44,8 | 56,9 |
| 85 | 21:30 | 43,7 | 53,7 |
| 86 | 21:45 | 44,8 | 54,7 |
| 87 | 22:00 | 45,5 | 53,3 |
| 88 | 22:15 | 43,3 | 54,9 |
| 89 | 22:30 | 42,3 | 58,0 |
| 90 | 22:45 | 43,0 | 55,8 |
| 91 | 23:00 | 44,5 | 56,2 |
| 92 | 23:15 | 40,2 | 56,9 |
| 93 | 23:30 | 46,1 | 56,2 |
| 94 | 23:45 | 43,6 | 57,2 |
| 95 | 00:00 | 45,5 | 54,4 |
| 96 | 00:15 | 41,5 | 47,2 |

**1.GÜN**
**22-23.09.2022**
**24.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 43,9 | 54,3 |
| 2 | 00:45 | 44,2 | 56,9 |
| 3 | 01:00 | 45,8 | 59,6 |
| 4 | 01:15 | 43,4 | 53,4 |
| 5 | 01:30 | 45,5 | 59,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | 01:45 | 43,1 | 54,7 | 50 | 12:45 | 50,1 | 59,9 |
| 7 | 02:00 | 43,0 | 55,9 | 51 | 13:00 | 54,1 | 61,3 |
| 8 | 02:15 | 45,2 | 60,4 | 52 | 13:15 | 51,4 | 60,7 |
| 9 | 02:30 | 43,3 | 54,5 | 53 | 13:30 | 50,7 | 62,5 |
| 10 | 02:45 | 42,3 | 55,2 | 54 | 13:45 | 50,5 | 63,3 |
| 11 | 03:00 | 43,0 | 56,9 | 55 | 14:00 | 51,2 | 66,0 |
| 12 | 03:15 | 43,6 | 55,2 | 56 | 14:15 | 50,4 | 62,6 |
| 13 | 03:30 | 40,2 | 53,0 | 57 | 14:30 | 54,6 | 64,5 |
| 14 | 03:45 | 39,5 | 54,0 | 58 | 14:45 | 50,7 | 61,5 |
| 15 | 04:00 | 39,8 | 52,4 | 59 | 15:00 | 50,4 | 60,9 |
| 16 | 04:15 | 38,9 | 52,9 | 60 | 15:15 | 48,8 | 59,2 |
| 17 | 04:30 | 40,6 | 54,4 | 61 | 15:30 | 48,7 | 54,3 |
| 18 | 04:45 | 40,3 | 56,1 | 62 | 15:45 | 46,5 | 54,4 |
| 19 | 05:00 | 41,5 | 54,0 | 63 | 16:00 | 48,0 | 56,4 |
| 20 | 05:15 | 41,8 | 54,6 | 64 | 16:15 | 48,6 | 57,4 |
| 21 | 05:30 | 39,6 | 51,2 | 65 | 16:30 | 47,8 | 53,1 |
| 22 | 05:45 | 38,3 | 49,0 | 66 | 16:45 | 48,6 | 52,1 |
| 23 | 06:00 | 38,1 | 50,3 | 67 | 17:00 | 48,5 | 52,8 |
| 24 | 06:15 | 41,6 | 52,9 | 68 | 17:15 | 49,7 | 56,7 |
| 25 | 06:30 | 43,0 | 55,1 | 69 | 17:30 | 49,5 | 58,6 |
| 26 | 06:45 | 42,7 | 56,7 | 70 | 17:45 | 50,8 | 57,9 |
| 27 | 07:00 | 42,3 | 55,0 | 71 | 18:00 | 46,5 | 61,1 |
| 28 | 07:15 | 45,1 | 58,5 | 72 | 18:15 | 50,6 | 65,1 |
| 29 | 07:30 | 44,8 | 60,1 | 73 | 18:30 | 51,5 | 62,0 |
| 30 | 07:45 | 48,5 | 58,8 | 74 | 18:45 | 48,4 | 59,6 |
| 31 | 08:00 | 49,4 | 61,0 | 75 | 19:00 | 51,4 | 61,0 |
| 32 | 08:15 | 53,3 | 60,6 | 76 | 19:15 | 49,6 | 61,0 |
| 33 | 08:30 | 53,9 | 63,9 | 77 | 19:30 | 48,8 | 62,6 |
| 34 | 08:45 | 51,4 | 65,6 | 78 | 19:45 | 50,2 | 63,1 |
| 35 | 09:00 | 52,3 | 62,4 | 79 | 20:00 | 47,9 | 59,0 |
| 36 | 09:15 | 51,9 | 57,8 | 80 | 20:15 | 47,9 | 61,8 |
| 37 | 09:30 | 52,5 | 60,8 | 81 | 20:30 | 44,7 | 55,2 |
| 38 | 09:45 | 49,9 | 58,8 | 82 | 20:45 | 43,9 | 53,8 |
| 39 | 10:00 | 49,2 | 58,8 | 83 | 21:00 | 46,1 | 59,5 |
| 40 | 10:15 | 51,3 | 58,3 | 84 | 21:15 | 44,0 | 56,6 |
| 41 | 10:30 | 51,9 | 60,2 | 85 | 21:30 | 44,5 | 58,3 |
| 42 | 10:45 | 50,4 | 58,9 | 86 | 21:45 | 43,8 | 59,0 |
| 43 | 11:00 | 52,7 | 62,3 | 87 | 22:00 | 42,0 | 54,8 |
| 44 | 11:15 | 49,8 | 57,9 | 88 | 22:15 | 43,3 | 57,6 |
| 45 | 11:30 | 51,9 | 59,8 | 89 | 22:30 | 45,2 | 60,2 |
| 46 | 11:45 | 49,7 | 56,5 | 90 | 22:45 | 47,7 | 61,9 |
| 47 | 12:00 | 49,6 | 57,5 | 91 | 23:00 | 45,7 | 57,2 |
| 48 | 12:15 | 50,2 | 58,8 | 92 | 23:15 | 44,7 | 60,0 |
| 49 | 12:30 | 51,1 | 58,5 | 93 | 23:30 | 45,7 | 58,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 94 | 23:45 | 44,9 | 60,2 |
| 95 | 00:00 | 44,3 | 55,4 |
| 96 | 00:15 | 46,0 | 57,5 |

**1.GÜN**
**22-23.09.2022**
**25.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,0 | 45,6 |
| 2 | 00:45 | 40,7 | 48,1 |
| 3 | 01:00 | 40,7 | 48,7 |
| 4 | 01:15 | 40,6 | 47,6 |
| 5 | 01:30 | 39,7 | 47,7 |
| 6 | 01:45 | 39,7 | 47,1 |
| 7 | 02:00 | 38,7 | 45,9 |
| 8 | 02:15 | 41,2 | 49,4 |
| 9 | 02:30 | 38,8 | 46,2 |
| 10 | 02:45 | 37,2 | 43,9 |
| 11 | 03:00 | 37,5 | 44,7 |
| 12 | 03:15 | 39,1 | 45,6 |
| 13 | 03:30 | 37,9 | 45,3 |
| 14 | 03:45 | 36,2 | 43,7 |
| 15 | 04:00 | 38,3 | 44,9 |
| 16 | 04:15 | 36,9 | 43,6 |
| 17 | 04:30 | 38,6 | 45,8 |
| 18 | 04:45 | 37,4 | 44,3 |
| 19 | 05:00 | 39,9 | 46,7 |
| 20 | 05:15 | 36,8 | 43,1 |
| 21 | 05:30 | 39,2 | 45,7 |
| 22 | 05:45 | 37,7 | 45,7 |
| 23 | 06:00 | 35,9 | 42,6 |
| 24 | 06:15 | 37,1 | 44,3 |
| 25 | 06:30 | 40,1 | 46,6 |
| 26 | 06:45 | 38,5 | 45,5 |
| 27 | 07:00 | 39,8 | 48,3 |
| 28 | 07:15 | 40,3 | 48,7 |
| 29 | 07:30 | 41,2 | 49,7 |
| 30 | 07:45 | 44,0 | 50,7 |
| 31 | 08:00 | 44,4 | 50,3 |
| 32 | 08:15 | 45,5 | 50,3 |
| 33 | 08:30 | 44,0 | 49,0 |
| 34 | 08:45 | 48,1 | 54,2 |
| 35 | 09:00 | 48,6 | 53,9 |
| 36 | 09:15 | 51,8 | 56,6 |
| 37 | 09:30 | 50,5 | 57,9 |
| 38 | 09:45 | 48,7 | 55,5 |
| 39 | 10:00 | 49,2 | 54,5 |
| 40 | 10:15 | 49,7 | 55,7 |
| 41 | 10:30 | 50,3 | 56,3 |
| 42 | 10:45 | 46,0 | 53,9 |
| 43 | 11:00 | 47,2 | 54,5 |
| 44 | 11:15 | 48,7 | 55,7 |
| 45 | 11:30 | 48,3 | 56,2 |
| 46 | 11:45 | 50,7 | 58,5 |
| 47 | 12:00 | 46,7 | 54,3 |
| 48 | 12:15 | 49,7 | 56,6 |
| 49 | 12:30 | 47,5 | 54,7 |
| 50 | 12:45 | 46,2 | 53,1 |
| 51 | 13:00 | 48,7 | 56,2 |
| 52 | 13:15 | 48,7 | 55,1 |
| 53 | 13:30 | 49,7 | 57,4 |
| 54 | 13:45 | 48,9 | 56,1 |
| 55 | 14:00 | 48,7 | 56,4 |
| 56 | 14:15 | 49,5 | 56,0 |
| 57 | 14:30 | 51,3 | 57,9 |
| 58 | 14:45 | 48,8 | 56,3 |
| 59 | 15:00 | 53,1 | 61,0 |
| 60 | 15:15 | 51,2 | 57,8 |
| 61 | 15:30 | 51,0 | 59,6 |
| 62 | 15:45 | 49,7 | 56,5 |
| 63 | 16:00 | 48,7 | 56,4 |
| 64 | 16:15 | 51,3 | 59,2 |
| 65 | 16:30 | 49,4 | 57,2 |
| 66 | 16:45 | 48,7 | 55,2 |
| 67 | 17:00 | 51,0 | 58,7 |
| 68 | 17:15 | 48,6 | 55,1 |
| 69 | 17:30 | 48,7 | 56,9 |
| 70 | 17:45 | 50,6 | 58,7 |
| 71 | 18:00 | 49,7 | 60,1 |
| 72 | 18:15 | 45,6 | 56,5 |
| 73 | 18:30 | 43,7 | 53,1 |
| 74 | 18:45 | 45,1 | 55,6 |
| 75 | 19:00 | 46,2 | 56,1 |
| 76 | 19:15 | 43,7 | 53,6 |
| 77 | 19:30 | 45,2 | 56,4 |
| 78 | 19:45 | 44,6 | 54,5 |
| 79 | 20:00 | 44,4 | 52,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 80 | 20:15 | 43,9 | 52,5 |
| 81 | 20:30 | 42,6 | 51,4 |
| 82 | 20:45 | 38,7 | 46,4 |
| 83 | 21:00 | 39,2 | 47,9 |
| 84 | 21:15 | 39,2 | 47,3 |
| 85 | 21:30 | 41,4 | 49,1 |
| 86 | 21:45 | 40,7 | 48,5 |
| 87 | 22:00 | 40,1 | 46,9 |
| 88 | 22:15 | 41,2 | 46,9 |
| 89 | 22:30 | 38,3 | 45,7 |
| 90 | 22:45 | 41,8 | 48,3 |
| 91 | 23:00 | 41,5 | 50,4 |
| 92 | 23:15 | 41,2 | 49,6 |
| 93 | 23:30 | 41,8 | 49,9 |
| 94 | 23:45 | 39,7 | 45,6 |
| 95 | 00:00 | 40,7 | 46,4 |
| 96 | 00:15 | 40,0 | 46,1 |

**1.GÜN**
**22-23.09.2022**
**26.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 36,6 | 56,2 |
| 2 | 00:45 | 37,7 | 55,1 |
| 3 | 01:00 | 37,8 | 56,6 |
| 4 | 01:15 | 41,7 | 61,7 |
| 5 | 01:30 | 43,0 | 59,2 |
| 6 | 01:45 | 41,9 | 56,7 |
| 7 | 02:00 | 41,8 | 54,6 |
| 8 | 02:15 | 41,8 | 62,4 |
| 9 | 02:30 | 40,4 | 57,4 |
| 10 | 02:45 | 40,5 | 57,6 |
| 11 | 03:00 | 42,7 | 52,2 |
| 12 | 03:15 | 41,7 | 56,3 |
| 13 | 03:30 | 40,6 | 57,9 |
| 14 | 03:45 | 40,8 | 60,4 |
| 15 | 04:00 | 40,5 | 56,0 |
| 16 | 04:15 | 40,2 | 57,2 |
| 17 | 04:30 | 42,8 | 62,0 |
| 18 | 04:45 | 42,9 | 63,0 |
| 19 | 05:00 | 42,5 | 57,7 |
| 20 | 05:15 | 42,1 | 57,5 |
| 21 | 05:30 | 41,8 | 55,3 |
| 22 | 05:45 | 39,6 | 54,6 |
| 23 | 06:00 | 37,4 | 55,1 |
| 24 | 06:15 | 36,9 | 50,9 |
| 25 | 06:30 | 38,5 | 52,2 |
| 26 | 06:45 | 39,1 | 53,4 |
| 27 | 07:00 | 39,7 | 51,9 |
| 28 | 07:15 | 41,3 | 51,6 |
| 29 | 07:30 | 41,8 | 53,1 |
| 30 | 07:45 | 45,6 | 51,0 |
| 31 | 08:00 | 46,0 | 51,6 |
| 32 | 08:15 | 45,9 | 51,3 |
| 33 | 08:30 | 48,3 | 51,3 |
| 34 | 08:45 | 49,5 | 54,7 |
| 35 | 09:00 | 49,5 | 56,5 |
| 36 | 09:15 | 51,5 | 59,7 |
| 37 | 09:30 | 50,8 | 55,9 |
| 38 | 09:45 | 51,9 | 57,0 |
| 39 | 10:00 | 52,6 | 56,3 |
| 40 | 10:15 | 50,8 | 55,9 |
| 41 | 10:30 | 51,4 | 57,8 |
| 42 | 10:45 | 48,5 | 58,2 |
| 43 | 11:00 | 48,4 | 54,1 |
| 44 | 11:15 | 50,3 | 55,1 |
| 45 | 11:30 | 49,9 | 54,6 |
| 46 | 11:45 | 51,6 | 60,2 |
| 47 | 12:00 | 49,8 | 54,8 |
| 48 | 12:15 | 52,4 | 59,5 |
| 49 | 12:30 | 51,2 | 55,9 |
| 50 | 12:45 | 52,6 | 57,0 |
| 51 | 13:00 | 51,2 | 57,1 |
| 52 | 13:15 | 51,9 | 61,3 |
| 53 | 13:30 | 52,2 | 61,0 |
| 54 | 13:45 | 53,6 | 59,2 |
| 55 | 14:00 | 52,3 | 57,8 |
| 56 | 14:15 | 53,0 | 58,1 |
| 57 | 14:30 | 53,6 | 59,3 |
| 58 | 14:45 | 50,7 | 59,9 |
| 59 | 15:00 | 52,5 | 60,0 |
| 60 | 15:15 | 53,8 | 61,5 |
| 61 | 15:30 | 53,3 | 60,7 |
| 62 | 15:45 | 52,8 | 61,1 |
| 63 | 16:00 | 52,7 | 60,7 |
| 64 | 16:15 | 52,0 | 59,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 65 | 16:30 | 52,3 | 60,5 |
| 66 | 16:45 | 52,3 | 58,6 |
| 67 | 17:00 | 53,6 | 60,7 |
| 68 | 17:15 | 52,9 | 59,3 |
| 69 | 17:30 | 53,7 | 63,4 |
| 70 | 17:45 | 52,6 | 61,9 |
| 71 | 18:00 | 47,6 | 62,7 |
| 72 | 18:15 | 48,3 | 58,8 |
| 73 | 18:30 | 43,6 | 55,3 |
| 74 | 18:45 | 44,9 | 53,7 |
| 75 | 19:00 | 42,7 | 52,5 |
| 76 | 19:15 | 41,8 | 51,4 |
| 77 | 19:30 | 43,6 | 53,0 |
| 78 | 19:45 | 41,0 | 51,4 |
| 79 | 20:00 | 39,5 | 48,9 |
| 80 | 20:15 | 39,8 | 47,7 |
| 81 | 20:30 | 39,9 | 51,0 |
| 82 | 20:45 | 37,8 | 46,5 |
| 83 | 21:00 | 39,6 | 46,5 |
| 84 | 21:15 | 38,0 | 47,6 |
| 85 | 21:30 | 39,5 | 47,6 |
| 86 | 21:45 | 39,9 | 53,5 |
| 87 | 22:00 | 42,0 | 54,8 |
| 88 | 22:15 | 41,7 | 54,8 |
| 89 | 22:30 | 41,8 | 56,7 |
| 90 | 22:45 | 41,5 | 58,8 |
| 91 | 23:00 | 42,2 | 56,8 |
| 92 | 23:15 | 45,1 | 59,6 |
| 93 | 23:30 | 41,0 | 60,2 |
| 94 | 23:45 | 43,3 | 59,4 |
| 95 | 00:00 | 40,9 | 60,6 |
| 96 | 00:15 | 39,8 | 57,7 |

**1.GÜN**
**22-23.09.2022**
**27.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,3 | 62,0 |
| 2 | 00:45 | 44,3 | 63,9 |
| 3 | 01:00 | 42,6 | 63,6 |
| 4 | 01:15 | 47,4 | 64,1 |
| 5 | 01:30 | 46,1 | 66,1 |
| 6 | 01:45 | 47,7 | 64,8 |
| 7 | 02:00 | 44,6 | 60,7 |
| 8 | 02:15 | 46,5 | 63,6 |
| 9 | 02:30 | 42,9 | 61,6 |
| 10 | 02:45 | 43,2 | 64,2 |
| 11 | 03:00 | 43,4 | 58,0 |
| 12 | 03:15 | 43,1 | 61,0 |
| 13 | 03:30 | 45,3 | 67,1 |
| 14 | 03:45 | 43,1 | 62,8 |
| 15 | 04:00 | 45,0 | 62,7 |
| 16 | 04:15 | 43,4 | 59,4 |
| 17 | 04:30 | 45,2 | 61,4 |
| 18 | 04:45 | 43,4 | 62,0 |
| 19 | 05:00 | 45,0 | 64,0 |
| 20 | 05:15 | 42,9 | 57,4 |
| 21 | 05:30 | 44,3 | 58,0 |
| 22 | 05:45 | 42,3 | 61,0 |
| 23 | 06:00 | 38,2 | 52,5 |
| 24 | 06:15 | 37,3 | 53,9 |
| 25 | 06:30 | 41,3 | 57,9 |
| 26 | 06:45 | 39,4 | 52,9 |
| 27 | 07:00 | 42,6 | 59,8 |
| 28 | 07:15 | 40,9 | 54,4 |
| 29 | 07:30 | 43,7 | 55,9 |
| 30 | 07:45 | 45,5 | 55,2 |
| 31 | 08:00 | 46,5 | 51,8 |
| 32 | 08:15 | 48,9 | 55,3 |
| 33 | 08:30 | 47,8 | 51,7 |
| 34 | 08:45 | 49,6 | 54,8 |
| 35 | 09:00 | 50,5 | 56,6 |
| 36 | 09:15 | 52,8 | 61,0 |
| 37 | 09:30 | 51,1 | 60,2 |
| 38 | 09:45 | 51,7 | 56,6 |
| 39 | 10:00 | 52,5 | 58,6 |
| 40 | 10:15 | 50,7 | 57,2 |
| 41 | 10:30 | 51,7 | 59,8 |
| 42 | 10:45 | 51,9 | 60,2 |
| 43 | 11:00 | 51,0 | 58,1 |
| 44 | 11:15 | 51,4 | 61,8 |
| 45 | 11:30 | 51,7 | 59,9 |
| 46 | 11:45 | 51,6 | 60,3 |
| 47 | 12:00 | 51,6 | 58,8 |
| 48 | 12:15 | 52,8 | 62,7 |
| 49 | 12:30 | 52,8 | 57,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 50 | 12:45 | 53,0 | 58,3 |
| 51 | 13:00 | 51,9 | 59,5 |
| 52 | 13:15 | 52,7 | 61,2 |
| 53 | 13:30 | 52,6 | 60,8 |
| 54 | 13:45 | 53,0 | 62,2 |
| 55 | 14:00 | 53,1 | 56,3 |
| 56 | 14:15 | 52,4 | 61,3 |
| 57 | 14:30 | 49,5 | 55,8 |
| 58 | 14:45 | 50,6 | 56,7 |
| 59 | 15:00 | 52,4 | 62,4 |
| 60 | 15:15 | 51,7 | 61,2 |
| 61 | 15:30 | 53,0 | 59,5 |
| 62 | 15:45 | 51,4 | 56,7 |
| 63 | 16:00 | 52,1 | 61,2 |
| 64 | 16:15 | 52,3 | 59,3 |
| 65 | 16:30 | 52,0 | 58,6 |
| 66 | 16:45 | 50,6 | 55,4 |
| 67 | 17:00 | 51,4 | 58,5 |
| 68 | 17:15 | 50,9 | 57,8 |
| 69 | 17:30 | 53,2 | 61,9 |
| 70 | 17:45 | 51,3 | 59,2 |
| 71 | 18:00 | 51,9 | 62,9 |
| 72 | 18:15 | 54,2 | 62,9 |
| 73 | 18:30 | 51,9 | 62,4 |
| 74 | 18:45 | 53,1 | 65,7 |
| 75 | 19:00 | 52,5 | 61,1 |
| 76 | 19:15 | 48,5 | 59,4 |
| 77 | 19:30 | 52,7 | 63,2 |
| 78 | 19:45 | 52,6 | 67,3 |
| 79 | 20:00 | 51,7 | 59,2 |
| 80 | 20:15 | 46,1 | 56,6 |
| 81 | 20:30 | 45,4 | 58,1 |
| 82 | 20:45 | 41,4 | 58,7 |
| 83 | 21:00 | 40,2 | 52,4 |
| 84 | 21:15 | 40,2 | 53,2 |
| 85 | 21:30 | 42,2 | 57,6 |
| 86 | 21:45 | 41,6 | 57,0 |
| 87 | 22:00 | 41,7 | 55,4 |
| 88 | 22:15 | 43,0 | 57,7 |
| 89 | 22:30 | 43,1 | 59,6 |
| 90 | 22:45 | 40,3 | 60,4 |
| 91 | 23:00 | 41,2 | 58,1 |
| 92 | 23:15 | 42,4 | 58,6 |
| 93 | 23:30 | 39,6 | 62,2 |
| 94 | 23:45 | 37,7 | 64,2 |
| 95 | 00:00 | 40,5 | 62,2 |
| 96 | 00:15 | 37,0 | 63,6 |

**1.GÜN**
**22-23.09.2022**
**28.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,3 | 56,5 |
| 2 | 00:45 | 40,4 | 55,0 |
| 3 | 01:00 | 41,3 | 58,7 |
| 4 | 01:15 | 43,0 | 61,0 |
| 5 | 01:30 | 43,5 | 57,5 |
| 6 | 01:45 | 43,2 | 56,0 |
| 7 | 02:00 | 42,5 | 53,2 |
| 8 | 02:15 | 42,1 | 60,4 |
| 9 | 02:30 | 41,5 | 56,2 |
| 10 | 02:45 | 42,8 | 58,7 |
| 11 | 03:00 | 43,1 | 53,1 |
| 12 | 03:15 | 43,2 | 56,3 |
| 13 | 03:30 | 43,6 | 59,5 |
| 14 | 03:45 | 43,2 | 61,5 |
| 15 | 04:00 | 43,4 | 57,5 |
| 16 | 04:15 | 43,6 | 59,3 |
| 17 | 04:30 | 43,1 | 61,1 |
| 18 | 04:45 | 41,9 | 58,7 |
| 19 | 05:00 | 40,9 | 53,5 |
| 20 | 05:15 | 40,6 | 53,1 |
| 21 | 05:30 | 40,2 | 51,1 |
| 22 | 05:45 | 38,5 | 50,7 |
| 23 | 06:00 | 38,0 | 53,2 |
| 24 | 06:15 | 37,5 | 49,7 |
| 25 | 06:30 | 39,3 | 50,7 |
| 26 | 06:45 | 39,1 | 47,9 |
| 27 | 07:00 | 39,2 | 55,5 |
| 28 | 07:15 | 38,7 | 51,9 |
| 29 | 07:30 | 41,8 | 53,9 |
| 30 | 07:45 | 45,0 | 54,4 |
| 31 | 08:00 | 45,7 | 51,5 |
| 32 | 08:15 | 47,3 | 53,9 |
| 33 | 08:30 | 47,6 | 51,4 |
| 34 | 08:45 | 46,3 | 53,5 |
| 35 | 09:00 | 49,5 | 54,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 36 | 09:15 | 48,6 | 56,5 |
| 37 | 09:30 | 49,0 | 58,1 |
| 38 | 09:45 | 49,3 | 54,7 |
| 39 | 10:00 | 50,5 | 57,2 |
| 40 | 10:15 | 50,3 | 53,7 |
| 41 | 10:30 | 50,7 | 56,8 |
| 42 | 10:45 | 51,4 | 54,5 |
| 43 | 11:00 | 51,1 | 56,7 |
| 44 | 11:15 | 50,7 | 57,3 |
| 45 | 11:30 | 50,3 | 59,0 |
| 46 | 11:45 | 51,4 | 55,8 |
| 47 | 12:00 | 51,1 | 54,0 |
| 48 | 12:15 | 51,8 | 56,0 |
| 49 | 12:30 | 51,9 | 57,5 |
| 50 | 12:45 | 52,1 | 58,1 |
| 51 | 13:00 | 51,6 | 59,7 |
| 52 | 13:15 | 50,9 | 56,7 |
| 53 | 13:30 | 50,7 | 55,3 |
| 54 | 13:45 | 50,4 | 57,7 |
| 55 | 14:00 | 51,7 | 54,4 |
| 56 | 14:15 | 49,9 | 56,8 |
| 57 | 14:30 | 48,7 | 53,8 |
| 58 | 14:45 | 49,0 | 55,3 |
| 59 | 15:00 | 49,3 | 57,3 |
| 60 | 15:15 | 50,7 | 56,7 |
| 61 | 15:30 | 49,4 | 54,1 |
| 62 | 15:45 | 49,1 | 52,6 |
| 63 | 16:00 | 49,6 | 56,7 |
| 64 | 16:15 | 48,9 | 54,5 |
| 65 | 16:30 | 49,3 | 55,9 |
| 66 | 16:45 | 49,8 | 55,0 |
| 67 | 17:00 | 50,4 | 55,8 |
| 68 | 17:15 | 50,1 | 53,2 |
| 69 | 17:30 | 49,0 | 56,0 |
| 70 | 17:45 | 50,7 | 57,2 |
| 71 | 18:00 | 49,4 | 58,3 |
| 72 | 18:15 | 49,3 | 57,8 |
| 73 | 18:30 | 49,5 | 62,4 |
| 74 | 18:45 | 50,5 | 61,9 |
| 75 | 19:00 | 50,1 | 59,8 |
| 76 | 19:15 | 49,8 | 55,1 |
| 77 | 19:30 | 50,2 | 61,0 |
| 78 | 19:45 | 48,1 | 62,4 |
| 79 | 20:00 | 44,7 | 57,2 |
| 80 | 20:15 | 42,5 | 58,7 |
| 81 | 20:30 | 39,9 | 60,4 |
| 82 | 20:45 | 39,4 | 56,7 |
| 83 | 21:00 | 38,8 | 51,0 |
| 84 | 21:15 | 38,2 | 53,0 |
| 85 | 21:30 | 39,9 | 55,0 |
| 86 | 21:45 | 37,6 | 54,5 |
| 87 | 22:00 | 38,1 | 52,9 |
| 88 | 22:15 | 39,4 | 53,6 |
| 89 | 22:30 | 39,5 | 55,3 |
| 90 | 22:45 | 38,6 | 56,7 |
| 91 | 23:00 | 39,3 | 54,6 |
| 92 | 23:15 | 39,6 | 52,8 |
| 93 | 23:30 | 36,7 | 55,5 |
| 94 | 23:45 | 37,3 | 52,7 |
| 95 | 00:00 | 37,6 | 56,0 |
| 96 | 00:15 | 35,5 | 53,2 |

**1.GÜN**
**22-23.09.2022**
**29.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,0 | 54,1 |
| 2 | 00:45 | 36,6 | 54,9 |
| 3 | 01:00 | 38,7 | 56,7 |
| 4 | 01:15 | 40,0 | 57,0 |
| 5 | 01:30 | 40,7 | 58,7 |
| 6 | 01:45 | 40,7 | 58,6 |
| 7 | 02:00 | 41,1 | 59,3 |
| 8 | 02:15 | 41,0 | 57,2 |
| 9 | 02:30 | 38,0 | 54,9 |
| 10 | 02:45 | 38,3 | 56,1 |
| 11 | 03:00 | 38,9 | 56,7 |
| 12 | 03:15 | 37,9 | 56,2 |
| 13 | 03:30 | 38,2 | 55,3 |
| 14 | 03:45 | 36,9 | 53,5 |
| 15 | 04:00 | 36,9 | 55,6 |
| 16 | 04:15 | 37,5 | 53,7 |
| 17 | 04:30 | 36,6 | 52,8 |
| 18 | 04:45 | 38,3 | 54,3 |
| 19 | 05:00 | 39,3 | 53,1 |
| 20 | 05:15 | 37,7 | 55,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 21 | 05:30 | 37,9 | 55,2 |
| 22 | 05:45 | 38,6 | 54,7 |
| 23 | 06:00 | 35,9 | 51,1 |
| 24 | 06:15 | 36,2 | 53,1 |
| 25 | 06:30 | 36,5 | 51,6 |
| 26 | 06:45 | 36,2 | 53,1 |
| 27 | 07:00 | 40,1 | 55,2 |
| 28 | 07:15 | 41,2 | 56,8 |
| 29 | 07:30 | 40,1 | 55,5 |
| 30 | 07:45 | 40,5 | 56,2 |
| 31 | 08:00 | 40,5 | 56,3 |
| 32 | 08:15 | 44,4 | 60,2 |
| 33 | 08:30 | 45,3 | 62,8 |
| 34 | 08:45 | 51,1 | 67,4 |
| 35 | 09:00 | 52,7 | 69,7 |
| 36 | 09:15 | 52,3 | 69,9 |
| 37 | 09:30 | 52,2 | 69,7 |
| 38 | 09:45 | 52,3 | 70,2 |
| 39 | 10:00 | 51,7 | 64,6 |
| 40 | 10:15 | 51,5 | 67,5 |
| 41 | 10:30 | 52,0 | 65,5 |
| 42 | 10:45 | 52,2 | 68,1 |
| 43 | 11:00 | 52,3 | 68,1 |
| 44 | 11:15 | 53,5 | 68,7 |
| 45 | 11:30 | 54,4 | 69,8 |
| 46 | 11:45 | 55,2 | 71,6 |
| 47 | 12:00 | 52,3 | 66,9 |
| 48 | 12:15 | 52,1 | 68,4 |
| 49 | 12:30 | 53,5 | 69,2 |
| 50 | 12:45 | 57,0 | 70,8 |
| 51 | 13:00 | 56,1 | 71,4 |
| 52 | 13:15 | 56,1 | 73,3 |
| 53 | 13:30 | 52,0 | 66,1 |
| 54 | 13:45 | 52,7 | 67,5 |
| 55 | 14:00 | 52,0 | 67,8 |
| 56 | 14:15 | 50,3 | 67,0 |
| 57 | 14:30 | 50,2 | 68,3 |
| 58 | 14:45 | 52,8 | 67,9 |
| 59 | 15:00 | 52,7 | 69,5 |
| 60 | 15:15 | 52,3 | 66,8 |
| 61 | 15:30 | 54,6 | 67,9 |
| 62 | 15:45 | 53,8 | 68,7 |
| 63 | 16:00 | 54,6 | 70,5 |
| 64 | 16:15 | 54,9 | 68,7 |
| 65 | 16:30 | 54,3 | 66,6 |
| 66 | 16:45 | 51,0 | 68,1 |
| 67 | 17:00 | 51,4 | 68,9 |
| 68 | 17:15 | 52,0 | 66,3 |
| 69 | 17:30 | 52,7 | 68,6 |
| 70 | 17:45 | 53,3 | 69,9 |
| 71 | 18:00 | 52,7 | 68,6 |
| 72 | 18:15 | 47,3 | 62,3 |
| 73 | 18:30 | 46,5 | 63,9 |
| 74 | 18:45 | 42,8 | 61,1 |
| 75 | 19:00 | 42,6 | 62,3 |
| 76 | 19:15 | 38,2 | 58,1 |
| 77 | 19:30 | 37,4 | 56,6 |
| 78 | 19:45 | 39,7 | 59,9 |
| 79 | 20:00 | 39,8 | 60,3 |
| 80 | 20:15 | 39,3 | 61,1 |
| 81 | 20:30 | 39,3 | 60,2 |
| 82 | 20:45 | 39,7 | 59,1 |
| 83 | 21:00 | 39,1 | 58,6 |
| 84 | 21:15 | 40,1 | 55,9 |
| 85 | 21:30 | 39,2 | 54,6 |
| 86 | 21:45 | 39,5 | 56,1 |
| 87 | 22:00 | 38,8 | 56,8 |
| 88 | 22:15 | 39,8 | 58,7 |
| 89 | 22:30 | 40,5 | 58,4 |
| 90 | 22:45 | 38,7 | 54,6 |
| 91 | 23:00 | 41,7 | 58,6 |
| 92 | 23:15 | 42,1 | 58,0 |
| 93 | 23:30 | 41,7 | 56,7 |
| 94 | 23:45 | 41,4 | 55,9 |
| 95 | 00:00 | 42,8 | 54,8 |
| 96 | 00:15 | 41,2 | 54,4 |

**1.GÜN**
**22-23.09.2022**
**30.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,8 | 57,5 |
| 2 | 00:45 | 40,0 | 57,3 |
| 3 | 01:00 | 40,6 | 57,0 |
| 4 | 01:15 | 42,0 | 62,7 |
| 5 | 01:30 | 41,8 | 61,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | 01:45 | 41,9 | 62,1 | 50 | 12:45 | 52,7 | 66,7 |
| 7 | 02:00 | 42,2 | 63,9 | 51 | 13:00 | 53,9 | 65,8 |
| 8 | 02:15 | 42,1 | 61,3 | 52 | 13:15 | 55,2 | 69,9 |
| 9 | 02:30 | 39,1 | 60,3 | 53 | 13:30 | 52,9 | 68,2 |
| 10 | 02:45 | 39,5 | 59,3 | 54 | 13:45 | 52,7 | 65,7 |
| 11 | 03:00 | 40,0 | 59,1 | 55 | 14:00 | 52,1 | 68,9 |
| 12 | 03:15 | 39,0 | 60,7 | 56 | 14:15 | 52,5 | 66,6 |
| 13 | 03:30 | 39,4 | 59,5 | 57 | 14:30 | 52,6 | 68,2 |
| 14 | 03:45 | 38,2 | 59,7 | 58 | 14:45 | 52,1 | 68,5 |
| 15 | 04:00 | 38,3 | 61,1 | 59 | 15:00 | 54,1 | 66,4 |
| 16 | 04:15 | 38,9 | 60,1 | 60 | 15:15 | 53,3 | 68,4 |
| 17 | 04:30 | 38,0 | 56,9 | 61 | 15:30 | 54,1 | 67,9 |
| 18 | 04:45 | 39,8 | 62,1 | 62 | 15:45 | 52,6 | 67,7 |
| 19 | 05:00 | 40,6 | 61,2 | 63 | 16:00 | 53,9 | 67,3 |
| 20 | 05:15 | 40,1 | 60,5 | 64 | 16:15 | 52,3 | 68,2 |
| 21 | 05:30 | 40,3 | 63,1 | 65 | 16:30 | 51,0 | 66,5 |
| 22 | 05:45 | 40,9 | 59,7 | 66 | 16:45 | 51,7 | 66,1 |
| 23 | 06:00 | 38,2 | 58,9 | 67 | 17:00 | 51,9 | 68,2 |
| 24 | 06:15 | 38,4 | 56,7 | 68 | 17:15 | 52,5 | 67,2 |
| 25 | 06:30 | 38,8 | 57,6 | 69 | 17:30 | 52,8 | 69,3 |
| 26 | 06:45 | 38,4 | 56,8 | 70 | 17:45 | 51,9 | 67,7 |
| 27 | 07:00 | 43,0 | 61,0 | 71 | 18:00 | 51,5 | 69,1 |
| 28 | 07:15 | 44,3 | 62,8 | 72 | 18:15 | 46,8 | 69,6 |
| 29 | 07:30 | 44,0 | 61,2 | 73 | 18:30 | 45,5 | 70,1 |
| 30 | 07:45 | 45,0 | 62,2 | 74 | 18:45 | 42,4 | 65,9 |
| 31 | 08:00 | 44,4 | 64,0 | 75 | 19:00 | 43,7 | 66,9 |
| 32 | 08:15 | 46,8 | 64,7 | 76 | 19:15 | 39,6 | 63,0 |
| 33 | 08:30 | 47,2 | 67,2 | 77 | 19:30 | 39,8 | 63,0 |
| 34 | 08:45 | 51,7 | 65,8 | 78 | 19:45 | 42,1 | 66,9 |
| 35 | 09:00 | 52,2 | 66,5 | 79 | 20:00 | 41,5 | 67,5 |
| 36 | 09:15 | 52,6 | 64,8 | 80 | 20:15 | 40,9 | 65,4 |
| 37 | 09:30 | 52,7 | 67,1 | 81 | 20:30 | 40,8 | 66,4 |
| 38 | 09:45 | 52,8 | 66,3 | 82 | 20:45 | 41,3 | 67,5 |
| 39 | 10:00 | 50,3 | 65,5 | 83 | 21:00 | 40,7 | 65,7 |
| 40 | 10:15 | 51,1 | 67,7 | 84 | 21:15 | 40,1 | 62,4 |
| 41 | 10:30 | 50,3 | 66,7 | 85 | 21:30 | 39,1 | 63,1 |
| 42 | 10:45 | 51,1 | 68,7 | 86 | 21:45 | 41,3 | 62,9 |
| 43 | 11:00 | 51,0 | 67,1 | 87 | 22:00 | 40,4 | 61,7 |
| 44 | 11:15 | 50,3 | 64,7 | 88 | 22:15 | 41,5 | 65,7 |
| 45 | 11:30 | 51,4 | 66,3 | 89 | 22:30 | 42,2 | 66,4 |
| 46 | 11:45 | 52,5 | 67,7 | 90 | 22:45 | 40,7 | 61,7 |
| 47 | 12:00 | 49,9 | 64,1 | 91 | 23:00 | 43,6 | 59,8 |
| 48 | 12:15 | 49,0 | 67,8 | 92 | 23:15 | 46,8 | 65,8 |
| 49 | 12:30 | 50,1 | 65,3 | 93 | 23:30 | 44,3 | 64,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 94 | 23:45 | 43,3 | 63,5 |
| 95 | 00:00 | 43,0 | 66,1 |
| 96 | 00:15 | 41,8 | 65,4 |

**1.GÜN**
**22-23.09.2022**
**31.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,7 | 54,9 |
| 2 | 00:45 | 39,8 | 54,7 |
| 3 | 01:00 | 40,4 | 54,5 |
| 4 | 01:15 | 41,7 | 59,9 |
| 5 | 01:30 | 41,6 | 58,4 |
| 6 | 01:45 | 41,6 | 59,3 |
| 7 | 02:00 | 42,0 | 61,0 |
| 8 | 02:15 | 41,9 | 58,6 |
| 9 | 02:30 | 39,0 | 57,5 |
| 10 | 02:45 | 39,3 | 56,7 |
| 11 | 03:00 | 39,8 | 56,4 |
| 12 | 03:15 | 38,9 | 58,0 |
| 13 | 03:30 | 39,2 | 56,9 |
| 14 | 03:45 | 37,7 | 56,4 |
| 15 | 04:00 | 37,8 | 57,7 |
| 16 | 04:15 | 38,4 | 56,8 |
| 17 | 04:30 | 37,5 | 53,8 |
| 18 | 04:45 | 39,2 | 58,7 |
| 19 | 05:00 | 39,9 | 57,8 |
| 20 | 05:15 | 39,5 | 57,1 |
| 21 | 05:30 | 39,7 | 59,7 |
| 22 | 05:45 | 40,3 | 56,4 |
| 23 | 06:00 | 37,7 | 55,7 |
| 24 | 06:15 | 37,9 | 53,6 |
| 25 | 06:30 | 38,3 | 54,5 |
| 26 | 06:45 | 37,9 | 53,7 |
| 27 | 07:00 | 42,3 | 57,6 |
| 28 | 07:15 | 43,6 | 59,4 |
| 29 | 07:30 | 43,3 | 57,8 |
| 30 | 07:45 | 44,4 | 58,8 |
| 31 | 08:00 | 43,8 | 60,4 |
| 32 | 08:15 | 48,4 | 64,2 |
| 33 | 08:30 | 48,8 | 66,9 |
| 34 | 08:45 | 53,7 | 65,5 |
| 35 | 09:00 | 54,2 | 66,2 |
| 36 | 09:15 | 54,5 | 64,3 |
| 37 | 09:30 | 54,7 | 66,7 |
| 38 | 09:45 | 54,8 | 65,9 |
| 39 | 10:00 | 52,3 | 65,0 |
| 40 | 10:15 | 53,1 | 67,3 |
| 41 | 10:30 | 52,3 | 66,4 |
| 42 | 10:45 | 53,1 | 68,2 |
| 43 | 11:00 | 53,0 | 66,7 |
| 44 | 11:15 | 52,3 | 64,2 |
| 45 | 11:30 | 53,3 | 65,9 |
| 46 | 11:45 | 54,4 | 67,3 |
| 47 | 12:00 | 51,9 | 63,7 |
| 48 | 12:15 | 50,8 | 67,4 |
| 49 | 12:30 | 52,0 | 64,8 |
| 50 | 12:45 | 54,7 | 66,4 |
| 51 | 13:00 | 56,0 | 65,5 |
| 52 | 13:15 | 57,3 | 69,4 |
| 53 | 13:30 | 52,9 | 65,0 |
| 54 | 13:45 | 52,6 | 62,7 |
| 55 | 14:00 | 52,0 | 65,8 |
| 56 | 14:15 | 52,4 | 63,5 |
| 57 | 14:30 | 52,5 | 65,0 |
| 58 | 14:45 | 52,0 | 65,5 |
| 59 | 15:00 | 53,9 | 63,3 |
| 60 | 15:15 | 53,2 | 65,4 |
| 61 | 15:30 | 53,9 | 64,8 |
| 62 | 15:45 | 52,5 | 64,6 |
| 63 | 16:00 | 53,7 | 64,2 |
| 64 | 16:15 | 52,3 | 65,0 |
| 65 | 16:30 | 50,9 | 63,4 |
| 66 | 16:45 | 51,7 | 63,1 |
| 67 | 17:00 | 51,8 | 65,0 |
| 68 | 17:15 | 52,4 | 64,1 |
| 69 | 17:30 | 52,1 | 65,5 |
| 70 | 17:45 | 51,2 | 63,9 |
| 71 | 18:00 | 50,9 | 65,4 |
| 72 | 18:15 | 46,2 | 65,8 |
| 73 | 18:30 | 44,8 | 66,3 |
| 74 | 18:45 | 41,7 | 62,3 |
| 75 | 19:00 | 43,1 | 63,2 |
| 76 | 19:15 | 39,1 | 59,6 |
| 77 | 19:30 | 39,2 | 59,6 |
| 78 | 19:45 | 41,5 | 63,2 |
| 79 | 20:00 | 40,9 | 63,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 80 | 20:15 | 40,3 | 61,8 |
| 81 | 20:30 | 40,2 | 62,7 |
| 82 | 20:45 | 40,7 | 63,8 |
| 83 | 21:00 | 40,1 | 62,0 |
| 84 | 21:15 | 39,5 | 59,1 |
| 85 | 21:30 | 38,6 | 59,7 |
| 86 | 21:45 | 40,7 | 59,5 |
| 87 | 22:00 | 39,8 | 58,4 |
| 88 | 22:15 | 40,9 | 62,0 |
| 89 | 22:30 | 41,6 | 62,7 |
| 90 | 22:45 | 40,1 | 58,4 |
| 91 | 23:00 | 42,9 | 56,4 |
| 92 | 23:15 | 46,2 | 62,2 |
| 93 | 23:30 | 43,6 | 61,0 |
| 94 | 23:45 | 42,7 | 60,1 |
| 95 | 00:00 | 42,3 | 58,0 |
| 96 | 00:15 | 41,1 | 56,1 |

**1.GÜN**
**22-23.09.2022**
**32.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,8 | 56,2 |
| 2 | 00:45 | 40,4 | 54,7 |
| 3 | 01:00 | 39,6 | 58,4 |
| 4 | 01:15 | 42,4 | 63,7 |
| 5 | 01:30 | 43,4 | 60,0 |
| 6 | 01:45 | 45,9 | 58,6 |
| 7 | 02:00 | 45,2 | 55,6 |
| 8 | 02:15 | 43,4 | 63,1 |
| 9 | 02:30 | 41,8 | 55,9 |
| 10 | 02:45 | 43,3 | 58,3 |
| 11 | 03:00 | 43,4 | 52,9 |
| 12 | 03:15 | 43,1 | 55,4 |
| 13 | 03:30 | 43,5 | 58,6 |
| 14 | 03:45 | 43,1 | 60,5 |
| 15 | 04:00 | 43,3 | 56,6 |
| 16 | 04:15 | 43,5 | 58,5 |
| 17 | 04:30 | 43,0 | 60,2 |
| 18 | 04:45 | 41,4 | 60,9 |
| 19 | 05:00 | 43,3 | 55,9 |
| 20 | 05:15 | 42,9 | 55,6 |
| 21 | 05:30 | 42,6 | 53,5 |
| 22 | 05:45 | 40,8 | 53,1 |
| 23 | 06:00 | 38,2 | 52,9 |
| 24 | 06:15 | 37,7 | 49,4 |
| 25 | 06:30 | 39,4 | 50,4 |
| 26 | 06:45 | 39,2 | 47,7 |
| 27 | 07:00 | 41,1 | 57,5 |
| 28 | 07:15 | 40,6 | 53,7 |
| 29 | 07:30 | 43,7 | 55,8 |
| 30 | 07:45 | 47,2 | 56,3 |
| 31 | 08:00 | 47,4 | 52,8 |
| 32 | 08:15 | 49,0 | 55,2 |
| 33 | 08:30 | 49,2 | 52,7 |
| 34 | 08:45 | 48,6 | 55,4 |
| 35 | 09:00 | 51,8 | 56,6 |
| 36 | 09:15 | 50,8 | 58,5 |
| 37 | 09:30 | 51,2 | 60,1 |
| 38 | 09:45 | 51,6 | 61,4 |
| 39 | 10:00 | 50,9 | 61,1 |
| 40 | 10:15 | 50,7 | 57,9 |
| 41 | 10:30 | 51,2 | 59,1 |
| 42 | 10:45 | 51,8 | 57,9 |
| 43 | 11:00 | 53,6 | 60,6 |
| 44 | 11:15 | 53,1 | 61,2 |
| 45 | 11:30 | 52,7 | 61,3 |
| 46 | 11:45 | 53,8 | 60,5 |
| 47 | 12:00 | 52,1 | 59,9 |
| 48 | 12:15 | 52,6 | 58,6 |
| 49 | 12:30 | 52,7 | 57,8 |
| 50 | 12:45 | 53,0 | 58,4 |
| 51 | 13:00 | 52,4 | 59,9 |
| 52 | 13:15 | 53,4 | 58,7 |
| 53 | 13:30 | 53,2 | 60,4 |
| 54 | 13:45 | 52,8 | 61,4 |
| 55 | 14:00 | 54,1 | 59,4 |
| 56 | 14:15 | 52,2 | 58,9 |
| 57 | 14:30 | 50,9 | 59,8 |
| 58 | 14:45 | 51,2 | 57,3 |
| 59 | 15:00 | 51,6 | 59,3 |
| 60 | 15:15 | 53,1 | 63,3 |
| 61 | 15:30 | 51,7 | 63,4 |
| 62 | 15:45 | 51,4 | 57,2 |
| 63 | 16:00 | 51,9 | 61,7 |
| 64 | 16:15 | 51,1 | 59,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 65 | 16:30 | 49,8 | 58,9 |
| 66 | 16:45 | 50,4 | 58,1 |
| 67 | 17:00 | 51,3 | 58,8 |
| 68 | 17:15 | 50,8 | 56,2 |
| 69 | 17:30 | 51,2 | 60,9 |
| 70 | 17:45 | 53,1 | 62,3 |
| 71 | 18:00 | 51,7 | 60,3 |
| 72 | 18:15 | 51,5 | 59,7 |
| 73 | 18:30 | 51,8 | 64,6 |
| 74 | 18:45 | 52,9 | 64,0 |
| 75 | 19:00 | 52,4 | 62,0 |
| 76 | 19:15 | 49,9 | 63,2 |
| 77 | 19:30 | 50,5 | 60,4 |
| 78 | 19:45 | 52,4 | 64,6 |
| 79 | 20:00 | 53,6 | 59,2 |
| 80 | 20:15 | 46,6 | 60,7 |
| 81 | 20:30 | 43,5 | 62,5 |
| 82 | 20:45 | 41,3 | 58,7 |
| 83 | 21:00 | 40,7 | 56,0 |
| 84 | 21:15 | 40,0 | 53,3 |
| 85 | 21:30 | 40,4 | 55,3 |
| 86 | 21:45 | 39,8 | 54,7 |
| 87 | 22:00 | 39,8 | 53,2 |
| 88 | 22:15 | 41,3 | 55,5 |
| 89 | 22:30 | 41,4 | 57,3 |
| 90 | 22:45 | 39,8 | 58,0 |
| 91 | 23:00 | 40,7 | 55,9 |
| 92 | 23:15 | 42,1 | 56,3 |
| 93 | 23:30 | 39,5 | 59,0 |
| 94 | 23:45 | 38,7 | 56,2 |
| 95 | 00:00 | 40,0 | 59,6 |
| 96 | 00:15 | 38,4 | 56,8 |

**1.GÜN**
**22-23.09.2022**
**33.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,5 | 53,4 |
| 2 | 00:45 | 35,7 | 53,7 |
| 3 | 01:00 | 37,1 | 54,3 |
| 4 | 01:15 | 38,3 | 54,6 |
| 5 | 01:30 | 39,7 | 57,4 |
| 6 | 01:45 | 38,9 | 56,1 |
| 7 | 02:00 | 39,7 | 57,3 |
| 8 | 02:15 | 40,0 | 56,0 |
| 9 | 02:30 | 38,6 | 55,8 |
| 10 | 02:45 | 38,3 | 56,0 |
| 11 | 03:00 | 39,8 | 58,1 |
| 12 | 03:15 | 40,0 | 59,6 |
| 13 | 03:30 | 39,3 | 56,8 |
| 14 | 03:45 | 38,2 | 55,6 |
| 15 | 04:00 | 37,8 | 57,2 |
| 16 | 04:15 | 38,1 | 54,6 |
| 17 | 04:30 | 36,5 | 53,0 |
| 18 | 04:45 | 38,4 | 54,3 |
| 19 | 05:00 | 39,2 | 53,3 |
| 20 | 05:15 | 37,9 | 55,7 |
| 21 | 05:30 | 38,0 | 55,2 |
| 22 | 05:45 | 38,4 | 54,6 |
| 23 | 06:00 | 36,0 | 51,4 |
| 24 | 06:15 | 36,0 | 53,2 |
| 25 | 06:30 | 36,5 | 51,8 |
| 26 | 06:45 | 36,0 | 53,2 |
| 27 | 07:00 | 44,3 | 61,1 |
| 28 | 07:15 | 45,7 | 63,2 |
| 29 | 07:30 | 44,1 | 61,0 |
| 30 | 07:45 | 42,8 | 59,5 |
| 31 | 08:00 | 42,3 | 59,1 |
| 32 | 08:15 | 48,7 | 66,3 |
| 33 | 08:30 | 48,1 | 66,6 |
| 34 | 08:45 | 53,5 | 70,7 |
| 35 | 09:00 | 51,7 | 74,9 |
| 36 | 09:15 | 51,3 | 75,1 |
| 37 | 09:30 | 52,1 | 74,9 |
| 38 | 09:45 | 51,7 | 74,7 |
| 39 | 10:00 | 51,5 | 70,6 |
| 40 | 10:15 | 51,6 | 73,0 |
| 41 | 10:30 | 56,2 | 70,8 |
| 42 | 10:45 | 53,5 | 75,1 |
| 43 | 11:00 | 51,4 | 72,3 |
| 44 | 11:15 | 51,7 | 72,9 |
| 45 | 11:30 | 51,8 | 71,5 |
| 46 | 11:45 | 51,7 | 73,7 |
| 47 | 12:00 | 51,8 | 71,3 |
| 48 | 12:15 | 53,4 | 70,3 |
| 49 | 12:30 | 50,8 | 73,9 |
| 50 | 12:45 | 53,0 | 75,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 51 | 13:00 | 53,1 | 80,2 |
| 52 | 13:15 | 50,4 | 77,5 |
| 53 | 13:30 | 53,4 | 72,6 |
| 54 | 13:45 | 51,6 | 72,2 |
| 55 | 14:00 | 54,0 | 75,7 |
| 56 | 14:15 | 51,6 | 74,4 |
| 57 | 14:30 | 53,4 | 73,1 |
| 58 | 14:45 | 52,0 | 72,0 |
| 59 | 15:00 | 52,9 | 77,5 |
| 60 | 15:15 | 51,7 | 72,0 |
| 61 | 15:30 | 52,5 | 75,8 |
| 62 | 15:45 | 54,1 | 74,4 |
| 63 | 16:00 | 52,5 | 78,4 |
| 64 | 16:15 | 52,8 | 76,7 |
| 65 | 16:30 | 53,5 | 70,3 |
| 66 | 16:45 | 51,3 | 75,0 |
| 67 | 17:00 | 50,6 | 72,9 |
| 68 | 17:15 | 52,4 | 70,1 |
| 69 | 17:30 | 54,1 | 75,8 |
| 70 | 17:45 | 52,7 | 77,1 |
| 71 | 18:00 | 51,8 | 71,0 |
| 72 | 18:15 | 47,8 | 64,5 |
| 73 | 18:30 | 45,7 | 66,1 |
| 74 | 18:45 | 43,7 | 61,0 |
| 75 | 19:00 | 42,0 | 61,6 |
| 76 | 19:15 | 38,0 | 58,0 |
| 77 | 19:30 | 38,6 | 56,3 |
| 78 | 19:45 | 38,9 | 59,1 |
| 79 | 20:00 | 39,0 | 59,5 |
| 80 | 20:15 | 37,1 | 58,0 |
| 81 | 20:30 | 38,6 | 59,3 |
| 82 | 20:45 | 37,0 | 55,2 |
| 83 | 21:00 | 38,4 | 58,0 |
| 84 | 21:15 | 36,6 | 53,1 |
| 85 | 21:30 | 37,1 | 53,8 |
| 86 | 21:45 | 37,7 | 53,7 |
| 87 | 22:00 | 38,9 | 57,3 |
| 88 | 22:15 | 38,4 | 56,9 |
| 89 | 22:30 | 39,6 | 57,2 |
| 90 | 22:45 | 37,8 | 53,3 |
| 91 | 23:00 | 40,8 | 57,3 |
| 92 | 23:15 | 44,1 | 66,5 |
| 93 | 23:30 | 42,0 | 60,9 |
| 94 | 23:45 | 41,8 | 64,6 |
| 95 | 00:00 | 41,2 | 61,3 |
| 96 | 00:15 | 40,9 | 60,7 |

**1.GÜN**
**22-23.09.2022**
**34.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,4 | 50,8 |
| 2 | 00:45 | 42,6 | 49,9 |
| 3 | 01:00 | 44,6 | 53,3 |
| 4 | 01:15 | 42,8 | 48,9 |
| 5 | 01:30 | 44,7 | 52,7 |
| 6 | 01:45 | 43,0 | 52,4 |
| 7 | 02:00 | 42,8 | 50,5 |
| 8 | 02:15 | 44,3 | 53,7 |
| 9 | 02:30 | 43,3 | 51,1 |
| 10 | 02:45 | 43,7 | 50,6 |
| 11 | 03:00 | 45,0 | 54,5 |
| 12 | 03:15 | 47,8 | 55,6 |
| 13 | 03:30 | 44,3 | 55,6 |
| 14 | 03:45 | 44,3 | 54,0 |
| 15 | 04:00 | 44,0 | 53,8 |
| 16 | 04:15 | 43,7 | 54,2 |
| 17 | 04:30 | 44,3 | 52,4 |
| 18 | 04:45 | 43,3 | 53,9 |
| 19 | 05:00 | 44,0 | 54,2 |
| 20 | 05:15 | 42,0 | 50,5 |
| 21 | 05:30 | 41,4 | 52,1 |
| 22 | 05:45 | 42,4 | 49,0 |
| 23 | 06:00 | 43,2 | 50,2 |
| 24 | 06:15 | 41,9 | 51,5 |
| 25 | 06:30 | 43,0 | 52,4 |
| 26 | 06:45 | 43,8 | 53,8 |
| 27 | 07:00 | 45,0 | 55,1 |
| 28 | 07:15 | 47,5 | 57,4 |
| 29 | 07:30 | 47,0 | 58,9 |
| 30 | 07:45 | 50,5 | 59,2 |
| 31 | 08:00 | 53,6 | 60,2 |
| 32 | 08:15 | 52,3 | 64,2 |
| 33 | 08:30 | 53,8 | 63,2 |
| 34 | 08:45 | 52,7 | 63,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 35 | 09:00 | 50,9 | 63,4 |
| 36 | 09:15 | 54,1 | 65,0 |
| 37 | 09:30 | 52,3 | 64,3 |
| 38 | 09:45 | 53,1 | 59,7 |
| 39 | 10:00 | 52,7 | 59,9 |
| 40 | 10:15 | 54,0 | 63,8 |
| 41 | 10:30 | 50,3 | 63,3 |
| 42 | 10:45 | 53,5 | 58,9 |
| 43 | 11:00 | 52,6 | 60,3 |
| 44 | 11:15 | 50,5 | 58,6 |
| 45 | 11:30 | 52,7 | 61,3 |
| 46 | 11:45 | 50,2 | 58,1 |
| 47 | 12:00 | 51,3 | 58,6 |
| 48 | 12:15 | 48,6 | 59,3 |
| 49 | 12:30 | 51,4 | 58,5 |
| 50 | 12:45 | 51,7 | 56,6 |
| 51 | 13:00 | 50,4 | 62,7 |
| 52 | 13:15 | 51,2 | 56,8 |
| 53 | 13:30 | 53,8 | 58,9 |
| 54 | 13:45 | 51,1 | 56,6 |
| 55 | 14:00 | 52,4 | 58,6 |
| 56 | 14:15 | 53,9 | 59,4 |
| 57 | 14:30 | 51,1 | 61,1 |
| 58 | 14:45 | 51,5 | 63,4 |
| 59 | 15:00 | 53,4 | 61,5 |
| 60 | 15:15 | 52,6 | 61,6 |
| 61 | 15:30 | 51,9 | 63,0 |
| 62 | 15:45 | 48,4 | 60,2 |
| 63 | 16:00 | 50,7 | 59,9 |
| 64 | 16:15 | 53,4 | 58,2 |
| 65 | 16:30 | 49,0 | 59,6 |
| 66 | 16:45 | 51,7 | 58,1 |
| 67 | 17:00 | 48,8 | 58,8 |
| 68 | 17:15 | 50,3 | 56,9 |
| 69 | 17:30 | 51,8 | 60,4 |
| 70 | 17:45 | 50,6 | 63,7 |
| 71 | 18:00 | 52,9 | 58,5 |
| 72 | 18:15 | 51,7 | 59,0 |
| 73 | 18:30 | 51,1 | 58,8 |
| 74 | 18:45 | 46,1 | 54,2 |
| 75 | 19:00 | 48,6 | 57,9 |
| 76 | 19:15 | 47,2 | 55,4 |
| 77 | 19:30 | 49,6 | 56,4 |
| 78 | 19:45 | 49,4 | 57,7 |
| 79 | 20:00 | 49,6 | 56,5 |
| 80 | 20:15 | 47,0 | 55,5 |
| 81 | 20:30 | 45,3 | 54,9 |
| 82 | 20:45 | 42,7 | 49,0 |
| 83 | 21:00 | 45,4 | 53,9 |
| 84 | 21:15 | 41,9 | 49,6 |
| 85 | 21:30 | 46,1 | 53,1 |
| 86 | 21:45 | 44,5 | 51,6 |
| 87 | 22:00 | 43,1 | 51,6 |
| 88 | 22:15 | 42,4 | 50,3 |
| 89 | 22:30 | 41,4 | 49,3 |
| 90 | 22:45 | 44,3 | 52,0 |
| 91 | 23:00 | 41,9 | 48,9 |
| 92 | 23:15 | 44,2 | 52,7 |
| 93 | 23:30 | 43,1 | 49,9 |
| 94 | 23:45 | 42,4 | 51,6 |
| 95 | 00:00 | 40,3 | 48,3 |
| 96 | 00:15 | 44,2 | 52,7 |

**1.GÜN**
**26-27.09.2022**
**35.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,5 | 48,7 |
| 2 | 00:45 | 39,8 | 50,0 |
| 3 | 01:00 | 38,7 | 50,6 |
| 4 | 01:15 | 39,2 | 48,8 |
| 5 | 01:30 | 40,0 | 50,6 |
| 6 | 01:45 | 39,3 | 52,4 |
| 7 | 02:00 | 37,7 | 47,9 |
| 8 | 02:15 | 41,3 | 53,6 |
| 9 | 02:30 | 40,4 | 48,9 |
| 10 | 02:45 | 39,3 | 48,4 |
| 11 | 03:00 | 40,2 | 52,3 |
| 12 | 03:15 | 44,1 | 53,2 |
| 13 | 03:30 | 41,2 | 55,5 |
| 14 | 03:45 | 40,0 | 51,9 |
| 15 | 04:00 | 40,9 | 54,8 |
| 16 | 04:15 | 38,9 | 53,2 |
| 17 | 04:30 | 43,6 | 53,9 |
| 18 | 04:45 | 40,1 | 52,2 |
| 19 | 05:00 | 42,8 | 55,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 20 | 05:15 | 39,2 | 49,3 |
| 21 | 05:30 | 40,2 | 53,0 |
| 22 | 05:45 | 39,2 | 49,8 |
| 23 | 06:00 | 37,7 | 48,9 |
| 24 | 06:15 | 37,1 | 49,7 |
| 25 | 06:30 | 41,7 | 53,3 |
| 26 | 06:45 | 39,5 | 53,1 |
| 27 | 07:00 | 41,9 | 56,1 |
| 28 | 07:15 | 45,5 | 57,8 |
| 29 | 07:30 | 44,5 | 57,5 |
| 30 | 07:45 | 46,9 | 58,9 |
| 31 | 08:00 | 49,7 | 60,6 |
| 32 | 08:15 | 52,4 | 62,7 |
| 33 | 08:30 | 49,8 | 62,9 |
| 34 | 08:45 | 49,4 | 64,5 |
| 35 | 09:00 | 52,5 | 63,3 |
| 36 | 09:15 | 53,8 | 64,7 |
| 37 | 09:30 | 52,6 | 64,2 |
| 38 | 09:45 | 50,3 | 59,6 |
| 39 | 10:00 | 51,6 | 60,4 |
| 40 | 10:15 | 52,4 | 62,9 |
| 41 | 10:30 | 54,6 | 63,1 |
| 42 | 10:45 | 50,8 | 58,1 |
| 43 | 11:00 | 49,3 | 58,7 |
| 44 | 11:15 | 49,8 | 60,2 |
| 45 | 11:30 | 48,9 | 61,0 |
| 46 | 11:45 | 49,4 | 61,4 |
| 47 | 12:00 | 48,0 | 56,6 |
| 48 | 12:15 | 48,0 | 57,7 |
| 49 | 12:30 | 48,6 | 57,1 |
| 50 | 12:45 | 49,0 | 57,5 |
| 51 | 13:00 | 53,6 | 60,0 |
| 52 | 13:15 | 50,5 | 60,7 |
| 53 | 13:30 | 54,7 | 61,0 |
| 54 | 13:45 | 50,4 | 59,9 |
| 55 | 14:00 | 52,3 | 60,3 |
| 56 | 14:15 | 53,2 | 61,8 |
| 57 | 14:30 | 52,5 | 62,0 |
| 58 | 14:45 | 48,3 | 57,2 |
| 59 | 15:00 | 54,0 | 63,1 |
| 60 | 15:15 | 52,1 | 61,1 |
| 61 | 15:30 | 52,3 | 61,0 |
| 62 | 15:45 | 47,8 | 56,1 |
| 63 | 16:00 | 50,0 | 58,1 |
| 64 | 16:15 | 54,3 | 60,9 |
| 65 | 16:30 | 48,4 | 59,3 |
| 66 | 16:45 | 49,0 | 58,4 |
| 67 | 17:00 | 48,2 | 61,0 |
| 68 | 17:15 | 47,7 | 59,6 |
| 69 | 17:30 | 52,5 | 63,3 |
| 70 | 17:45 | 53,3 | 64,0 |
| 71 | 18:00 | 48,4 | 65,2 |
| 72 | 18:15 | 49,1 | 66,6 |
| 73 | 18:30 | 47,5 | 63,1 |
| 74 | 18:45 | 45,5 | 59,2 |
| 75 | 19:00 | 45,5 | 61,1 |
| 76 | 19:15 | 44,7 | 56,3 |
| 77 | 19:30 | 49,0 | 57,2 |
| 78 | 19:45 | 48,9 | 58,6 |
| 79 | 20:00 | 47,1 | 55,2 |
| 80 | 20:15 | 44,2 | 55,7 |
| 81 | 20:30 | 44,8 | 55,7 |
| 82 | 20:45 | 40,2 | 50,5 |
| 83 | 21:00 | 42,7 | 52,1 |
| 84 | 21:15 | 39,7 | 50,5 |
| 85 | 21:30 | 45,4 | 53,9 |
| 86 | 21:45 | 42,5 | 55,2 |
| 87 | 22:00 | 42,5 | 52,3 |
| 88 | 22:15 | 41,9 | 53,1 |
| 89 | 22:30 | 40,8 | 52,2 |
| 90 | 22:45 | 43,8 | 55,1 |
| 91 | 23:00 | 41,3 | 51,8 |
| 92 | 23:15 | 43,8 | 53,4 |
| 93 | 23:30 | 42,2 | 53,3 |
| 94 | 23:45 | 40,2 | 50,3 |
| 95 | 00:00 | 39,8 | 51,1 |
| 96 | 00:15 | 41,5 | 53,0 |

**1.GÜN**
**26-27.09.2022**
**36.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,0 | 56,4 |
| 2 | 00:45 | 39,1 | 56,2 |
| 3 | 01:00 | 39,7 | 55,9 |
| 4 | 01:15 | 40,9 | 61,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | 01:30 | 40,6 | 59,5 | 49 | 12:30 | 47,3 | 61,6 |
| 6 | 01:45 | 40,6 | 60,4 | 50 | 12:45 | 49,7 | 63,1 |
| 7 | 02:00 | 39,0 | 59,2 | 51 | 13:00 | 51,1 | 62,2 |
| 8 | 02:15 | 41,0 | 59,7 | 52 | 13:15 | 52,3 | 66,0 |
| 9 | 02:30 | 37,8 | 58,2 | 53 | 13:30 | 48,1 | 61,8 |
| 10 | 02:45 | 38,1 | 57,4 | 54 | 13:45 | 47,8 | 59,6 |
| 11 | 03:00 | 38,6 | 57,2 | 55 | 14:00 | 47,3 | 62,6 |
| 12 | 03:15 | 37,7 | 58,7 | 56 | 14:15 | 47,6 | 60,5 |
| 13 | 03:30 | 38,9 | 59,0 | 57 | 14:30 | 47,7 | 61,8 |
| 14 | 03:45 | 37,3 | 58,6 | 58 | 14:45 | 47,3 | 62,2 |
| 15 | 04:00 | 37,4 | 59,9 | 59 | 15:00 | 49,1 | 60,2 |
| 16 | 04:15 | 38,1 | 58,9 | 60 | 15:15 | 48,4 | 62,1 |
| 17 | 04:30 | 37,1 | 55,8 | 61 | 15:30 | 49,1 | 61,6 |
| 18 | 04:45 | 36,4 | 56,9 | 62 | 15:45 | 47,7 | 61,5 |
| 19 | 05:00 | 39,0 | 59,1 | 63 | 16:00 | 48,9 | 61,1 |
| 20 | 05:15 | 37,1 | 56,1 | 64 | 16:15 | 47,6 | 61,8 |
| 21 | 05:30 | 38,8 | 60,9 | 65 | 16:30 | 46,2 | 60,4 |
| 22 | 05:45 | 39,4 | 57,7 | 66 | 16:45 | 47,0 | 60,0 |
| 23 | 06:00 | 35,3 | 54,6 | 67 | 17:00 | 47,1 | 61,8 |
| 24 | 06:15 | 37,5 | 55,5 | 68 | 17:15 | 47,6 | 61,0 |
| 25 | 06:30 | 37,9 | 56,5 | 69 | 17:30 | 47,4 | 62,2 |
| 26 | 06:45 | 37,5 | 55,6 | 70 | 17:45 | 46,5 | 60,8 |
| 27 | 07:00 | 42,0 | 59,8 | 71 | 18:00 | 46,2 | 62,1 |
| 28 | 07:15 | 39,7 | 56,5 | 72 | 18:15 | 42,0 | 62,6 |
| 29 | 07:30 | 39,5 | 55,1 | 73 | 18:30 | 40,7 | 62,9 |
| 30 | 07:45 | 40,3 | 55,9 | 74 | 18:45 | 38,0 | 59,2 |
| 31 | 08:00 | 39,9 | 57,4 | 75 | 19:00 | 39,3 | 60,1 |
| 32 | 08:15 | 44,0 | 61,1 | 76 | 19:15 | 35,6 | 56,7 |
| 33 | 08:30 | 44,4 | 63,5 | 77 | 19:30 | 35,7 | 56,7 |
| 34 | 08:45 | 48,9 | 62,2 | 78 | 19:45 | 37,8 | 60,1 |
| 35 | 09:00 | 49,3 | 62,9 | 79 | 20:00 | 37,2 | 60,7 |
| 36 | 09:15 | 49,5 | 61,2 | 80 | 20:15 | 36,7 | 58,8 |
| 37 | 09:30 | 49,7 | 63,4 | 81 | 20:30 | 38,0 | 61,8 |
| 38 | 09:45 | 49,8 | 62,7 | 82 | 20:45 | 39,8 | 65,2 |
| 39 | 10:00 | 47,6 | 61,8 | 83 | 21:00 | 39,3 | 63,3 |
| 40 | 10:15 | 48,3 | 64,0 | 84 | 21:15 | 38,6 | 60,3 |
| 41 | 10:30 | 47,6 | 63,1 | 85 | 21:30 | 37,7 | 61,0 |
| 42 | 10:45 | 48,3 | 64,8 | 86 | 21:45 | 39,9 | 61,0 |
| 43 | 11:00 | 48,2 | 63,4 | 87 | 22:00 | 39,1 | 59,7 |
| 44 | 11:15 | 47,6 | 61,1 | 88 | 22:15 | 40,1 | 63,5 |
| 45 | 11:30 | 48,5 | 62,7 | 89 | 22:30 | 40,8 | 64,3 |
| 46 | 11:45 | 49,5 | 64,0 | 90 | 22:45 | 39,4 | 59,7 |
| 47 | 12:00 | 47,2 | 60,6 | 91 | 23:00 | 42,1 | 57,9 |
| 48 | 12:15 | 46,1 | 64,1 | 92 | 23:15 | 45,3 | 63,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 93 | 23:30 | 40,1 | 58,6 |
| 94 | 23:45 | 39,3 | 57,8 |
| 95 | 00:00 | 38,9 | 60,1 |
| 96 | 00:15 | 40,3 | 63,3 |

**1.GÜN**
**26-27.09.2022**
**37.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,8 | 55,7 |
| 2 | 00:45 | 39,8 | 54,3 |
| 3 | 01:00 | 41,7 | 58,0 |
| 4 | 01:15 | 44,6 | 56,5 |
| 5 | 01:30 | 45,1 | 59,5 |
| 6 | 01:45 | 44,8 | 58,1 |
| 7 | 02:00 | 44,2 | 55,2 |
| 8 | 02:15 | 43,6 | 58,0 |
| 9 | 02:30 | 40,9 | 55,4 |
| 10 | 02:45 | 42,4 | 57,9 |
| 11 | 03:00 | 42,6 | 52,5 |
| 12 | 03:15 | 42,3 | 55,0 |
| 13 | 03:30 | 42,7 | 58,1 |
| 14 | 03:45 | 42,3 | 60,0 |
| 15 | 04:00 | 42,5 | 56,1 |
| 16 | 04:15 | 42,7 | 58,0 |
| 17 | 04:30 | 42,2 | 59,6 |
| 18 | 04:45 | 43,0 | 60,3 |
| 19 | 05:00 | 42,5 | 55,4 |
| 20 | 05:15 | 42,1 | 55,1 |
| 21 | 05:30 | 41,7 | 53,2 |
| 22 | 05:45 | 39,9 | 52,8 |
| 23 | 06:00 | 37,5 | 52,6 |
| 24 | 06:15 | 37,0 | 49,0 |
| 25 | 06:30 | 38,8 | 50,0 |
| 26 | 06:45 | 38,5 | 47,2 |
| 27 | 07:00 | 40,2 | 57,0 |
| 28 | 07:15 | 39,7 | 53,4 |
| 29 | 07:30 | 42,9 | 55,3 |
| 30 | 07:45 | 46,2 | 55,8 |
| 31 | 08:00 | 46,5 | 52,5 |
| 32 | 08:15 | 48,0 | 54,8 |
| 33 | 08:30 | 48,3 | 52,4 |
| 34 | 08:45 | 47,6 | 54,9 |
| 35 | 09:00 | 50,8 | 56,1 |
| 36 | 09:15 | 49,7 | 58,1 |
| 37 | 09:30 | 50,2 | 59,6 |
| 38 | 09:45 | 50,6 | 56,1 |
| 39 | 10:00 | 49,8 | 56,5 |
| 40 | 10:15 | 49,6 | 53,0 |
| 41 | 10:30 | 50,0 | 56,0 |
| 42 | 10:45 | 50,7 | 53,8 |
| 43 | 11:00 | 52,7 | 58,3 |
| 44 | 11:15 | 52,2 | 58,9 |
| 45 | 11:30 | 51,7 | 60,6 |
| 46 | 11:45 | 52,9 | 57,4 |
| 47 | 12:00 | 51,0 | 53,8 |
| 48 | 12:15 | 51,7 | 55,8 |
| 49 | 12:30 | 51,8 | 57,3 |
| 50 | 12:45 | 52,0 | 57,9 |
| 51 | 13:00 | 51,5 | 59,5 |
| 52 | 13:15 | 52,5 | 58,3 |
| 53 | 13:30 | 52,3 | 56,8 |
| 54 | 13:45 | 51,8 | 59,2 |
| 55 | 14:00 | 53,2 | 55,8 |
| 56 | 14:15 | 51,3 | 58,4 |
| 57 | 14:30 | 49,8 | 55,2 |
| 58 | 14:45 | 50,2 | 56,8 |
| 59 | 15:00 | 50,6 | 58,9 |
| 60 | 15:15 | 52,2 | 58,3 |
| 61 | 15:30 | 50,7 | 55,5 |
| 62 | 15:45 | 50,4 | 54,1 |
| 63 | 16:00 | 50,9 | 58,3 |
| 64 | 16:15 | 50,0 | 55,9 |
| 65 | 16:30 | 49,0 | 55,7 |
| 66 | 16:45 | 49,6 | 54,8 |
| 67 | 17:00 | 50,3 | 55,6 |
| 68 | 17:15 | 49,9 | 53,1 |
| 69 | 17:30 | 50,2 | 57,6 |
| 70 | 17:45 | 52,2 | 58,8 |
| 71 | 18:00 | 50,7 | 59,8 |
| 72 | 18:15 | 50,5 | 59,3 |
| 73 | 18:30 | 50,8 | 57,5 |
| 74 | 18:45 | 51,9 | 59,7 |
| 75 | 19:00 | 51,5 | 58,9 |
| 76 | 19:15 | 49,1 | 54,4 |
| 77 | 19:30 | 49,5 | 60,1 |
| 78 | 19:45 | 51,5 | 61,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 79 | 20:00 | 52,7 | 58,8 |
| 80 | 20:15 | 45,5 | 60,2 |
| 81 | 20:30 | 42,7 | 62,0 |
| 82 | 20:45 | 40,4 | 58,3 |
| 83 | 21:00 | 42,3 | 52,6 |
| 84 | 21:15 | 43,7 | 52,9 |
| 85 | 21:30 | 41,5 | 54,8 |
| 86 | 21:45 | 39,2 | 54,3 |
| 87 | 22:00 | 39,2 | 52,8 |
| 88 | 22:15 | 40,4 | 55,0 |
| 89 | 22:30 | 40,5 | 56,8 |
| 90 | 22:45 | 38,1 | 55,9 |
| 91 | 23:00 | 38,8 | 53,9 |
| 92 | 23:15 | 40,0 | 54,3 |
| 93 | 23:30 | 37,8 | 57,0 |
| 94 | 23:45 | 37,0 | 54,2 |
| 95 | 00:00 | 38,6 | 57,6 |
| 96 | 00:15 | 38,7 | 55,4 |

**1.GÜN**
**26-27.09.2022**
**38.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,4 | 49,3 |
| 2 | 00:45 | 41,9 | 50,1 |
| 3 | 01:00 | 41,6 | 50,8 |
| 4 | 01:15 | 41,4 | 49,4 |
| 5 | 01:30 | 41,9 | 50,3 |
| 6 | 01:45 | 41,4 | 49,1 |
| 7 | 02:00 | 41,0 | 50,3 |
| 8 | 02:15 | 41,9 | 49,3 |
| 9 | 02:30 | 41,7 | 48,2 |
| 10 | 02:45 | 41,2 | 49,3 |
| 11 | 03:00 | 40,9 | 50,3 |
| 12 | 03:15 | 42,6 | 49,0 |
| 13 | 03:30 | 41,0 | 51,5 |
| 14 | 03:45 | 41,5 | 49,6 |
| 15 | 04:00 | 41,0 | 50,4 |
| 16 | 04:15 | 40,4 | 52,3 |
| 17 | 04:30 | 40,9 | 51,3 |
| 18 | 04:45 | 41,7 | 49,8 |
| 19 | 05:00 | 40,9 | 49,8 |
| 20 | 05:15 | 40,6 | 49,8 |
| 21 | 05:30 | 38,5 | 47,7 |
| 22 | 05:45 | 38,3 | 48,1 |
| 23 | 06:00 | 38,5 | 46,1 |
| 24 | 06:15 | 39,4 | 47,3 |
| 25 | 06:30 | 40,2 | 48,6 |
| 26 | 06:45 | 39,9 | 44,1 |
| 27 | 07:00 | 39,2 | 45,8 |
| 28 | 07:15 | 42,0 | 49,1 |
| 29 | 07:30 | 43,0 | 52,1 |
| 30 | 07:45 | 48,1 | 53,6 |
| 31 | 08:00 | 48,4 | 56,0 |
| 32 | 08:15 | 47,3 | 52,8 |
| 33 | 08:30 | 50,6 | 53,9 |
| 34 | 08:45 | 51,5 | 56,8 |
| 35 | 09:00 | 50,9 | 58,1 |
| 36 | 09:15 | 51,0 | 59,0 |
| 37 | 09:30 | 52,3 | 57,3 |
| 38 | 09:45 | 53,4 | 58,6 |
| 39 | 10:00 | 52,7 | 56,1 |
| 40 | 10:15 | 52,3 | 57,3 |
| 41 | 10:30 | 52,4 | 58,9 |
| 42 | 10:45 | 49,9 | 60,0 |
| 43 | 11:00 | 50,3 | 56,2 |
| 44 | 11:15 | 51,8 | 57,1 |
| 45 | 11:30 | 52,6 | 57,1 |
| 46 | 11:45 | 51,1 | 59,5 |
| 47 | 12:00 | 51,7 | 57,0 |
| 48 | 12:15 | 51,8 | 58,8 |
| 49 | 12:30 | 52,7 | 57,3 |
| 50 | 12:45 | 54,1 | 58,7 |
| 51 | 13:00 | 53,2 | 59,4 |
| 52 | 13:15 | 53,3 | 60,6 |
| 53 | 13:30 | 53,8 | 59,2 |
| 54 | 13:45 | 54,1 | 60,6 |
| 55 | 14:00 | 53,8 | 59,5 |
| 56 | 14:15 | 56,2 | 57,5 |
| 57 | 14:30 | 55,2 | 61,0 |
| 58 | 14:45 | 52,7 | 62,2 |
| 59 | 15:00 | 53,4 | 58,8 |
| 60 | 15:15 | 53,2 | 60,8 |
| 61 | 15:30 | 51,7 | 58,8 |
| 62 | 15:45 | 52,3 | 60,5 |
| 63 | 16:00 | 54,1 | 60,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 64 | 16:15 | 52,8 | 58,4 |
| 65 | 16:30 | 53,7 | 59,8 |
| 66 | 16:45 | 53,8 | 60,4 |
| 67 | 17:00 | 54,9 | 60,0 |
| 68 | 17:15 | 54,5 | 61,0 |
| 69 | 17:30 | 55,0 | 62,6 |
| 70 | 17:45 | 54,2 | 63,8 |
| 71 | 18:00 | 47,1 | 61,9 |
| 72 | 18:15 | 47,2 | 57,5 |
| 73 | 18:30 | 45,0 | 56,9 |
| 74 | 18:45 | 44,5 | 53,1 |
| 75 | 19:00 | 43,9 | 54,0 |
| 76 | 19:15 | 43,0 | 52,8 |
| 77 | 19:30 | 43,3 | 52,5 |
| 78 | 19:45 | 40,5 | 50,8 |
| 79 | 20:00 | 40,6 | 50,3 |
| 80 | 20:15 | 41,3 | 49,5 |
| 81 | 20:30 | 39,4 | 50,4 |
| 82 | 20:45 | 39,0 | 47,9 |
| 83 | 21:00 | 41,1 | 48,4 |
| 84 | 21:15 | 39,2 | 48,9 |
| 85 | 21:30 | 39,1 | 47,1 |
| 86 | 21:45 | 39,4 | 46,6 |
| 87 | 22:00 | 39,0 | 47,3 |
| 88 | 22:15 | 39,3 | 46,6 |
| 89 | 22:30 | 39,6 | 45,9 |
| 90 | 22:45 | 42,6 | 46,0 |
| 91 | 23:00 | 43,4 | 49,9 |
| 92 | 23:15 | 42,7 | 50,4 |
| 93 | 23:30 | 40,6 | 51,1 |
| 94 | 23:45 | 40,9 | 49,0 |
| 95 | 00:00 | 40,8 | 48,4 |
| 96 | 00:15 | 38,4 | 49,1 |

**1.GÜN**
**26-27.09.2022**
**39.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 36,8 | 60,7 |
| 2 | 00:45 | 36,9 | 56,2 |
| 3 | 01:00 | 37,5 | 57,8 |
| 4 | 01:15 | 38,9 | 58,0 |
| 5 | 01:30 | 38,7 | 56,6 |
| 6 | 01:45 | 38,8 | 57,3 |
| 7 | 02:00 | 39,1 | 59,1 |
| 8 | 02:15 | 39,0 | 56,8 |
| 9 | 02:30 | 36,1 | 55,8 |
| 10 | 02:45 | 37,3 | 56,1 |
| 11 | 03:00 | 38,9 | 57,6 |
| 12 | 03:15 | 37,9 | 59,2 |
| 13 | 03:30 | 38,2 | 58,0 |
| 14 | 03:45 | 36,7 | 57,5 |
| 15 | 04:00 | 36,8 | 58,9 |
| 16 | 04:15 | 37,4 | 58,1 |
| 17 | 04:30 | 33,9 | 51,1 |
| 18 | 04:45 | 35,6 | 55,8 |
| 19 | 05:00 | 36,4 | 54,9 |
| 20 | 05:15 | 35,9 | 54,4 |
| 21 | 05:30 | 36,2 | 56,8 |
| 22 | 05:45 | 36,7 | 53,5 |
| 23 | 06:00 | 34,1 | 52,9 |
| 24 | 06:15 | 34,4 | 51,0 |
| 25 | 06:30 | 36,4 | 51,8 |
| 26 | 06:45 | 37,6 | 51,1 |
| 27 | 07:00 | 42,6 | 52,7 |
| 28 | 07:15 | 43,9 | 51,8 |
| 29 | 07:30 | 43,8 | 50,9 |
| 30 | 07:45 | 44,6 | 54,9 |
| 31 | 08:00 | 44,0 | 61,0 |
| 32 | 08:15 | 48,9 | 62,5 |
| 33 | 08:30 | 49,2 | 63,7 |
| 34 | 08:45 | 54,0 | 61,7 |
| 35 | 09:00 | 54,6 | 63,0 |
| 36 | 09:15 | 55,0 | 60,9 |
| 37 | 09:30 | 55,1 | 61,4 |
| 38 | 09:45 | 54,7 | 68,6 |
| 39 | 10:00 | 52,0 | 67,9 |
| 40 | 10:15 | 52,8 | 70,0 |
| 41 | 10:30 | 52,0 | 69,0 |
| 42 | 10:45 | 54,0 | 72,3 |
| 43 | 11:00 | 51,6 | 68,1 |
| 44 | 11:15 | 51,1 | 65,5 |
| 45 | 11:30 | 52,1 | 67,2 |
| 46 | 11:45 | 52,9 | 68,6 |
| 47 | 12:00 | 50,5 | 64,8 |
| 48 | 12:15 | 49,5 | 68,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 49 | 12:30 | 50,6 | 66,2 |
| 50 | 12:45 | 55,6 | 70,4 |
| 51 | 13:00 | 56,9 | 69,4 |
| 52 | 13:15 | 58,2 | 73,6 |
| 53 | 13:30 | 53,1 | 68,4 |
| 54 | 13:45 | 53,4 | 66,6 |
| 55 | 14:00 | 52,6 | 69,7 |
| 56 | 14:15 | 52,9 | 67,4 |
| 57 | 14:30 | 53,3 | 69,0 |
| 58 | 14:45 | 52,6 | 69,4 |
| 59 | 15:00 | 55,1 | 67,2 |
| 60 | 15:15 | 54,3 | 69,2 |
| 61 | 15:30 | 55,1 | 68,8 |
| 62 | 15:45 | 53,3 | 68,5 |
| 63 | 16:00 | 54,7 | 68,1 |
| 64 | 16:15 | 52,3 | 68,4 |
| 65 | 16:30 | 51,2 | 66,7 |
| 66 | 16:45 | 51,8 | 66,5 |
| 67 | 17:00 | 51,9 | 68,3 |
| 68 | 17:15 | 52,5 | 67,3 |
| 69 | 17:30 | 52,3 | 68,8 |
| 70 | 17:45 | 51,5 | 67,3 |
| 71 | 18:00 | 51,1 | 68,6 |
| 72 | 18:15 | 46,3 | 69,2 |
| 73 | 18:30 | 45,1 | 69,6 |
| 74 | 18:45 | 39,6 | 61,6 |
| 75 | 19:00 | 40,8 | 62,4 |
| 76 | 19:15 | 37,0 | 59,0 |
| 77 | 19:30 | 35,7 | 56,7 |
| 78 | 19:45 | 37,4 | 59,3 |
| 79 | 20:00 | 36,7 | 59,9 |
| 80 | 20:15 | 36,3 | 58,1 |
| 81 | 20:30 | 36,2 | 59,0 |
| 82 | 20:45 | 36,5 | 59,9 |
| 83 | 21:00 | 36,1 | 58,4 |
| 84 | 21:15 | 35,6 | 55,5 |
| 85 | 21:30 | 34,7 | 56,1 |
| 86 | 21:45 | 37,3 | 57,0 |
| 87 | 22:00 | 36,7 | 56,0 |
| 88 | 22:15 | 37,6 | 59,6 |
| 89 | 22:30 | 38,7 | 60,8 |
| 90 | 22:45 | 37,1 | 56,6 |
| 91 | 23:00 | 39,9 | 54,9 |
| 92 | 23:15 | 44,1 | 62,1 |
| 93 | 23:30 | 41,7 | 60,9 |
| 94 | 23:45 | 40,9 | 60,1 |
| 95 | 00:00 | 40,5 | 62,5 |
| 96 | 00:15 | 39,2 | 61,8 |

**1.GÜN**
**26-27.09.2022**
**40.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,3 | 54,6 |
| 2 | 00:45 | 36,6 | 54,8 |
| 3 | 01:00 | 37,9 | 55,4 |
| 4 | 01:15 | 39,0 | 55,7 |
| 5 | 01:30 | 40,6 | 58,6 |
| 6 | 01:45 | 39,8 | 57,3 |
| 7 | 02:00 | 40,5 | 58,5 |
| 8 | 02:15 | 40,8 | 57,2 |
| 9 | 02:30 | 39,4 | 57,1 |
| 10 | 02:45 | 39,1 | 57,2 |
| 11 | 03:00 | 40,7 | 59,3 |
| 12 | 03:15 | 40,9 | 61,0 |
| 13 | 03:30 | 40,1 | 58,0 |
| 14 | 03:45 | 39,4 | 57,4 |
| 15 | 04:00 | 39,0 | 59,0 |
| 16 | 04:15 | 39,3 | 56,3 |
| 17 | 04:30 | 37,8 | 54,7 |
| 18 | 04:45 | 39,6 | 55,9 |
| 19 | 05:00 | 40,4 | 55,1 |
| 20 | 05:15 | 39,1 | 57,6 |
| 21 | 05:30 | 39,2 | 56,9 |
| 22 | 05:45 | 39,6 | 56,3 |
| 23 | 06:00 | 37,2 | 53,0 |
| 24 | 06:15 | 37,3 | 55,0 |
| 25 | 06:30 | 37,8 | 53,3 |
| 26 | 06:45 | 37,3 | 55,0 |
| 27 | 07:00 | 45,8 | 63,1 |
| 28 | 07:15 | 47,1 | 65,1 |
| 29 | 07:30 | 45,5 | 63,0 |
| 30 | 07:45 | 44,2 | 61,4 |
| 31 | 08:00 | 43,8 | 61,0 |
| 32 | 08:15 | 47,9 | 65,1 |
| 33 | 08:30 | 47,2 | 65,2 |
| 34 | 08:45 | 52,5 | 69,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 35 | 09:00 | 52,7 | 70,4 |
| 36 | 09:15 | 50,4 | 70,0 |
| 37 | 09:30 | 53,8 | 68,7 |
| 38 | 09:45 | 53,6 | 67,4 |
| 39 | 10:00 | 52,3 | 67,0 |
| 40 | 10:15 | 53,5 | 68,3 |
| 41 | 10:30 | 54,0 | 66,9 |
| 42 | 10:45 | 51,4 | 63,0 |
| 43 | 11:00 | 53,3 | 66,0 |
| 44 | 11:15 | 52,6 | 63,5 |
| 45 | 11:30 | 53,8 | 61,6 |
| 46 | 11:45 | 52,6 | 62,4 |
| 47 | 12:00 | 53,8 | 64,1 |
| 48 | 12:15 | 52,5 | 69,0 |
| 49 | 12:30 | 53,0 | 72,6 |
| 50 | 12:45 | 52,8 | 74,3 |
| 51 | 13:00 | 53,5 | 78,7 |
| 52 | 13:15 | 52,3 | 76,0 |
| 53 | 13:30 | 53,6 | 74,2 |
| 54 | 13:45 | 51,8 | 73,7 |
| 55 | 14:00 | 51,0 | 77,4 |
| 56 | 14:15 | 51,9 | 76,1 |
| 57 | 14:30 | 53,5 | 74,5 |
| 58 | 14:45 | 50,9 | 73,6 |
| 59 | 15:00 | 53,1 | 79,0 |
| 60 | 15:15 | 51,9 | 73,5 |
| 61 | 15:30 | 52,8 | 77,5 |
| 62 | 15:45 | 52,3 | 76,0 |
| 63 | 16:00 | 51,0 | 80,1 |
| 64 | 16:15 | 51,6 | 78,3 |
| 65 | 16:30 | 53,7 | 71,9 |
| 66 | 16:45 | 51,5 | 76,8 |
| 67 | 17:00 | 52,7 | 74,4 |
| 68 | 17:15 | 51,3 | 71,6 |
| 69 | 17:30 | 52,9 | 78,3 |
| 70 | 17:45 | 51,5 | 79,5 |
| 71 | 18:00 | 52,0 | 73,3 |
| 72 | 18:15 | 49,2 | 66,5 |
| 73 | 18:30 | 47,3 | 68,1 |
| 74 | 18:45 | 45,0 | 63,1 |
| 75 | 19:00 | 43,3 | 63,6 |
| 76 | 19:15 | 39,3 | 59,8 |
| 77 | 19:30 | 39,8 | 58,1 |
| 78 | 19:45 | 40,1 | 60,9 |
| 79 | 20:00 | 40,2 | 61,5 |
| 80 | 20:15 | 38,3 | 59,8 |
| 81 | 20:30 | 39,8 | 61,1 |
| 82 | 20:45 | 38,2 | 57,0 |
| 83 | 21:00 | 39,6 | 59,8 |
| 84 | 21:15 | 37,8 | 54,6 |
| 85 | 21:30 | 38,3 | 55,5 |
| 86 | 21:45 | 39,0 | 55,4 |
| 87 | 22:00 | 40,1 | 59,1 |
| 88 | 22:15 | 39,6 | 58,7 |
| 89 | 22:30 | 40,9 | 59,0 |
| 90 | 22:45 | 39,0 | 54,9 |
| 91 | 23:00 | 42,1 | 59,1 |
| 92 | 23:15 | 45,5 | 68,5 |
| 93 | 23:30 | 43,4 | 62,8 |
| 94 | 23:45 | 43,1 | 66,7 |
| 95 | 00:00 | 42,5 | 63,3 |
| 96 | 00:15 | 42,2 | 62,6 |

**1.GÜN**
**26-27.09.2022**
**41.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,8 | 63,7 |
| 2 | 00:45 | 39,9 | 58,6 |
| 3 | 01:00 | 38,2 | 58,9 |
| 4 | 01:15 | 39,6 | 59,2 |
| 5 | 01:30 | 40,2 | 59,0 |
| 6 | 01:45 | 39,5 | 58,5 |
| 7 | 02:00 | 40,3 | 61,0 |
| 8 | 02:15 | 40,5 | 59,1 |
| 9 | 02:30 | 39,1 | 60,5 |
| 10 | 02:45 | 38,8 | 58,5 |
| 11 | 03:00 | 40,4 | 60,1 |
| 12 | 03:15 | 40,6 | 63,6 |
| 13 | 03:30 | 39,7 | 60,4 |
| 14 | 03:45 | 39,0 | 61,1 |
| 15 | 04:00 | 38,8 | 62,0 |
| 16 | 04:15 | 38,9 | 60,5 |
| 17 | 04:30 | 37,3 | 56,2 |
| 18 | 04:45 | 39,2 | 61,4 |
| 19 | 05:00 | 40,1 | 60,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 20 | 05:15 | 39,6 | 59,8 |
| 21 | 05:30 | 39,8 | 62,5 |
| 22 | 05:45 | 40,1 | 58,6 |
| 23 | 06:00 | 37,7 | 58,6 |
| 24 | 06:15 | 37,8 | 56,1 |
| 25 | 06:30 | 40,6 | 60,5 |
| 26 | 06:45 | 41,8 | 61,7 |
| 27 | 07:00 | 47,4 | 59,9 |
| 28 | 07:15 | 48,8 | 62,5 |
| 29 | 07:30 | 48,5 | 61,7 |
| 30 | 07:45 | 47,4 | 65,8 |
| 31 | 08:00 | 46,3 | 66,9 |
| 32 | 08:15 | 51,4 | 70,0 |
| 33 | 08:30 | 49,6 | 70,9 |
| 34 | 08:45 | 54,1 | 68,7 |
| 35 | 09:00 | 54,0 | 71,6 |
| 36 | 09:15 | 51,6 | 69,4 |
| 37 | 09:30 | 53,4 | 72,1 |
| 38 | 09:45 | 54,0 | 70,6 |
| 39 | 10:00 | 54,8 | 71,2 |
| 40 | 10:15 | 52,5 | 73,0 |
| 41 | 10:30 | 54,3 | 72,0 |
| 42 | 10:45 | 53,4 | 75,6 |
| 43 | 11:00 | 53,8 | 71,0 |
| 44 | 11:15 | 53,3 | 68,4 |
| 45 | 11:30 | 52,8 | 67,8 |
| 46 | 11:45 | 53,7 | 69,4 |
| 47 | 12:00 | 53,2 | 68,3 |
| 48 | 12:15 | 50,0 | 69,4 |
| 49 | 12:30 | 53,3 | 69,7 |
| 50 | 12:45 | 54,1 | 71,3 |
| 51 | 13:00 | 53,5 | 73,8 |
| 52 | 13:15 | 52,4 | 73,5 |
| 53 | 13:30 | 52,1 | 74,9 |
| 54 | 13:45 | 53,4 | 70,0 |
| 55 | 14:00 | 51,6 | 76,4 |
| 56 | 14:15 | 52,0 | 73,8 |
| 57 | 14:30 | 54,1 | 72,7 |
| 58 | 14:45 | 53,0 | 72,2 |
| 59 | 15:00 | 53,3 | 73,6 |
| 60 | 15:15 | 51,7 | 73,6 |
| 61 | 15:30 | 53,3 | 75,4 |
| 62 | 15:45 | 53,7 | 72,9 |
| 63 | 16:00 | 52,9 | 74,6 |
| 64 | 16:15 | 51,2 | 75,7 |
| 65 | 16:30 | 53,9 | 70,2 |
| 66 | 16:45 | 53,8 | 72,8 |
| 67 | 17:00 | 52,5 | 71,9 |
| 68 | 17:15 | 51,4 | 70,8 |
| 69 | 17:30 | 51,9 | 76,2 |
| 70 | 17:45 | 53,1 | 74,3 |
| 71 | 18:00 | 54,0 | 76,6 |
| 72 | 18:15 | 51,8 | 77,4 |
| 73 | 18:30 | 50,2 | 77,9 |
| 74 | 18:45 | 44,0 | 68,7 |
| 75 | 19:00 | 45,5 | 69,6 |
| 76 | 19:15 | 41,4 | 65,9 |
| 77 | 19:30 | 39,8 | 63,2 |
| 78 | 19:45 | 41,4 | 65,7 |
| 79 | 20:00 | 40,6 | 66,2 |
| 80 | 20:15 | 38,6 | 61,7 |
| 81 | 20:30 | 40,0 | 65,4 |
| 82 | 20:45 | 38,6 | 63,0 |
| 83 | 21:00 | 39,9 | 64,6 |
| 84 | 21:15 | 37,9 | 59,0 |
| 85 | 21:30 | 38,4 | 62,0 |
| 86 | 21:45 | 38,5 | 58,9 |
| 87 | 22:00 | 39,8 | 60,6 |
| 88 | 22:15 | 39,3 | 62,1 |
| 89 | 22:30 | 40,2 | 63,4 |
| 90 | 22:45 | 38,8 | 59,0 |
| 91 | 23:00 | 41,5 | 57,1 |
| 92 | 23:15 | 47,8 | 67,5 |
| 93 | 23:30 | 43,5 | 63,5 |
| 94 | 23:45 | 44,4 | 65,1 |
| 95 | 00:00 | 42,3 | 65,1 |
| 96 | 00:15 | 40,8 | 64,3 |

**1.GÜN**
**26-27.09.2022**
**42.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,0 | 57,7 |
| 2 | 00:45 | 40,8 | 60,3 |
| 3 | 01:00 | 42,4 | 63,2 |
| 4 | 01:15 | 44,9 | 64,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | 01:30 | 45,3 | 65,0 | 49 | 12:30 | 51,9 | 56,7 |
| 6 | 01:45 | 45,0 | 65,6 | 50 | 12:45 | 52,1 | 57,3 |
| 7 | 02:00 | 44,4 | 60,2 | 51 | 13:00 | 51,6 | 58,9 |
| 8 | 02:15 | 43,7 | 59,9 | 52 | 13:15 | 53,4 | 57,7 |
| 9 | 02:30 | 42,2 | 60,4 | 53 | 13:30 | 52,4 | 56,3 |
| 10 | 02:45 | 42,5 | 60,7 | 54 | 13:45 | 52,0 | 58,6 |
| 11 | 03:00 | 42,7 | 57,1 | 55 | 14:00 | 52,2 | 55,8 |
| 12 | 03:15 | 42,3 | 59,9 | 56 | 14:15 | 51,4 | 57,8 |
| 13 | 03:30 | 42,7 | 63,3 | 57 | 14:30 | 48,7 | 54,7 |
| 14 | 03:45 | 42,3 | 65,5 | 58 | 14:45 | 50,2 | 56,3 |
| 15 | 04:00 | 42,5 | 61,0 | 59 | 15:00 | 50,8 | 58,3 |
| 16 | 04:15 | 42,7 | 63,2 | 60 | 15:15 | 50,7 | 57,7 |
| 17 | 04:30 | 42,2 | 61,8 | 61 | 15:30 | 50,9 | 55,0 |
| 18 | 04:45 | 43,1 | 63,6 | 62 | 15:45 | 50,4 | 53,5 |
| 19 | 05:00 | 42,6 | 60,4 | 63 | 16:00 | 51,1 | 57,7 |
| 20 | 05:15 | 42,2 | 60,0 | 64 | 16:15 | 50,7 | 55,4 |
| 21 | 05:30 | 41,9 | 57,9 | 65 | 16:30 | 49,0 | 55,3 |
| 22 | 05:45 | 40,0 | 57,4 | 66 | 16:45 | 49,7 | 54,3 |
| 23 | 06:00 | 37,5 | 57,3 | 67 | 17:00 | 50,4 | 55,2 |
| 24 | 06:15 | 37,1 | 53,4 | 68 | 17:15 | 50,0 | 52,5 |
| 25 | 06:30 | 38,8 | 54,6 | 69 | 17:30 | 50,2 | 57,0 |
| 26 | 06:45 | 38,5 | 51,5 | 70 | 17:45 | 50,4 | 58,2 |
| 27 | 07:00 | 40,3 | 56,5 | 71 | 18:00 | 50,9 | 59,2 |
| 28 | 07:15 | 39,8 | 52,8 | 72 | 18:15 | 50,6 | 58,7 |
| 29 | 07:30 | 43,0 | 54,8 | 73 | 18:30 | 51,0 | 61,9 |
| 30 | 07:45 | 45,7 | 55,3 | 74 | 18:45 | 52,1 | 61,7 |
| 31 | 08:00 | 46,6 | 52,0 | 75 | 19:00 | 51,6 | 60,9 |
| 32 | 08:15 | 48,1 | 54,2 | 76 | 19:15 | 47,8 | 54,8 |
| 33 | 08:30 | 48,0 | 51,9 | 77 | 19:30 | 49,7 | 59,6 |
| 34 | 08:45 | 49,1 | 54,3 | 78 | 19:45 | 51,6 | 63,5 |
| 35 | 09:00 | 49,6 | 55,7 | 79 | 20:00 | 52,7 | 59,7 |
| 36 | 09:15 | 49,8 | 57,5 | 80 | 20:15 | 45,8 | 59,9 |
| 37 | 09:30 | 50,2 | 59,0 | 81 | 20:30 | 42,8 | 61,5 |
| 38 | 09:45 | 50,8 | 55,7 | 82 | 20:45 | 40,7 | 57,7 |
| 39 | 10:00 | 50,0 | 56,0 | 83 | 21:00 | 39,9 | 52,1 |
| 40 | 10:15 | 49,8 | 57,7 | 84 | 21:15 | 39,4 | 52,4 |
| 41 | 10:30 | 50,3 | 57,1 | 85 | 21:30 | 39,9 | 54,3 |
| 42 | 10:45 | 50,9 | 58,0 | 86 | 21:45 | 39,2 | 53,7 |
| 43 | 11:00 | 50,7 | 57,7 | 87 | 22:00 | 39,2 | 52,3 |
| 44 | 11:15 | 52,3 | 58,3 | 88 | 22:15 | 40,7 | 54,4 |
| 45 | 11:30 | 51,9 | 60,0 | 89 | 22:30 | 40,8 | 56,3 |
| 46 | 11:45 | 52,9 | 56,8 | 90 | 22:45 | 41,1 | 52,9 |
| 47 | 12:00 | 51,2 | 57,7 | 91 | 23:00 | 40,6 | 52,6 |
| 48 | 12:15 | 51,8 | 55,4 | 92 | 23:15 | 40,1 | 53,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 93 | 23:30 | 37,8 | 54,1 |
| 94 | 23:45 | 37,1 | 53,6 |
| 95 | 00:00 | 38,2 | 55,4 |
| 96 | 00:15 | 40,5 | 52,8 |

**1.GÜN**
**26-27.09.2022**
**43.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,9 | 57,3 |
| 2 | 00:45 | 40,9 | 55,8 |
| 3 | 01:00 | 41,8 | 59,5 |
| 4 | 01:15 | 43,7 | 61,8 |
| 5 | 01:30 | 44,2 | 58,3 |
| 6 | 01:45 | 43,9 | 56,8 |
| 7 | 02:00 | 43,2 | 53,9 |
| 8 | 02:15 | 42,7 | 61,3 |
| 9 | 02:30 | 42,0 | 57,0 |
| 10 | 02:45 | 43,5 | 59,5 |
| 11 | 03:00 | 43,8 | 53,8 |
| 12 | 03:15 | 43,9 | 57,1 |
| 13 | 03:30 | 44,3 | 60,4 |
| 14 | 03:45 | 43,9 | 62,3 |
| 15 | 04:00 | 44,1 | 58,3 |
| 16 | 04:15 | 44,3 | 60,2 |
| 17 | 04:30 | 43,8 | 61,9 |
| 18 | 04:45 | 42,4 | 59,5 |
| 19 | 05:00 | 41,4 | 54,2 |
| 20 | 05:15 | 41,1 | 53,8 |
| 21 | 05:30 | 40,8 | 51,9 |
| 22 | 05:45 | 39,1 | 51,5 |
| 23 | 06:00 | 38,6 | 53,9 |
| 24 | 06:15 | 38,0 | 50,4 |
| 25 | 06:30 | 39,9 | 51,5 |
| 26 | 06:45 | 39,7 | 48,6 |
| 27 | 07:00 | 39,8 | 56,3 |
| 28 | 07:15 | 39,3 | 52,7 |
| 29 | 07:30 | 42,3 | 54,6 |
| 30 | 07:45 | 45,6 | 55,1 |
| 31 | 08:00 | 46,3 | 52,3 |
| 32 | 08:15 | 48,0 | 54,6 |
| 33 | 08:30 | 48,3 | 52,2 |
| 34 | 08:45 | 47,0 | 54,2 |
| 35 | 09:00 | 50,2 | 55,5 |
| 36 | 09:15 | 49,2 | 57,3 |
| 37 | 09:30 | 49,6 | 58,9 |
| 38 | 09:45 | 50,0 | 55,5 |
| 39 | 10:00 | 51,3 | 58,0 |
| 40 | 10:15 | 51,0 | 54,4 |
| 41 | 10:30 | 51,5 | 57,6 |
| 42 | 10:45 | 52,2 | 55,2 |
| 43 | 11:00 | 51,9 | 57,5 |
| 44 | 11:15 | 51,5 | 58,1 |
| 45 | 11:30 | 51,0 | 59,9 |
| 46 | 11:45 | 52,2 | 56,6 |
| 47 | 12:00 | 51,9 | 54,7 |
| 48 | 12:15 | 52,6 | 56,8 |
| 49 | 12:30 | 52,7 | 58,3 |
| 50 | 12:45 | 52,9 | 58,9 |
| 51 | 13:00 | 52,4 | 60,6 |
| 52 | 13:15 | 51,7 | 57,5 |
| 53 | 13:30 | 51,5 | 56,1 |
| 54 | 13:45 | 51,2 | 58,5 |
| 55 | 14:00 | 52,5 | 55,1 |
| 56 | 14:15 | 50,6 | 57,6 |
| 57 | 14:30 | 49,3 | 54,5 |
| 58 | 14:45 | 49,6 | 56,1 |
| 59 | 15:00 | 50,0 | 58,1 |
| 60 | 15:15 | 51,5 | 57,5 |
| 61 | 15:30 | 50,1 | 54,8 |
| 62 | 15:45 | 49,7 | 53,3 |
| 63 | 16:00 | 50,3 | 57,5 |
| 64 | 16:15 | 49,5 | 55,2 |
| 65 | 16:30 | 49,9 | 56,7 |
| 66 | 16:45 | 50,5 | 55,8 |
| 67 | 17:00 | 51,2 | 56,6 |
| 68 | 17:15 | 50,8 | 53,9 |
| 69 | 17:30 | 49,6 | 56,8 |
| 70 | 17:45 | 51,5 | 58,0 |
| 71 | 18:00 | 50,1 | 59,1 |
| 72 | 18:15 | 49,9 | 58,6 |
| 73 | 18:30 | 50,2 | 63,2 |
| 74 | 18:45 | 51,3 | 62,7 |
| 75 | 19:00 | 50,8 | 60,7 |
| 76 | 19:15 | 50,5 | 55,9 |
| 77 | 19:30 | 50,9 | 61,8 |
| 78 | 19:45 | 50,8 | 63,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 79 | 20:00 | 47,6 | 58,0 |
| 80 | 20:15 | 45,0 | 59,5 |
| 81 | 20:30 | 42,1 | 61,3 |
| 82 | 20:45 | 40,0 | 57,5 |
| 83 | 21:00 | 39,4 | 51,8 |
| 84 | 21:15 | 40,1 | 53,7 |
| 85 | 21:30 | 40,5 | 55,8 |
| 86 | 21:45 | 39,9 | 55,2 |
| 87 | 22:00 | 39,9 | 53,6 |
| 88 | 22:15 | 40,0 | 54,3 |
| 89 | 22:30 | 40,1 | 56,1 |
| 90 | 22:45 | 39,2 | 57,5 |
| 91 | 23:00 | 39,9 | 55,3 |
| 92 | 23:15 | 39,7 | 53,5 |
| 93 | 23:30 | 37,2 | 56,3 |
| 94 | 23:45 | 36,4 | 53,4 |
| 95 | 00:00 | 37,7 | 56,8 |
| 96 | 00:15 | 36,2 | 53,9 |

**1.GÜN**
**26-27.09.2022**
**44.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,0 | 64,3 |
| 2 | 00:45 | 38,7 | 58,9 |
| 3 | 01:00 | 38,4 | 59,5 |
| 4 | 01:15 | 40,0 | 59,7 |
| 5 | 01:30 | 40,5 | 59,3 |
| 6 | 01:45 | 39,9 | 59,0 |
| 7 | 02:00 | 40,6 | 61,5 |
| 8 | 02:15 | 40,9 | 59,5 |
| 9 | 02:30 | 39,4 | 60,9 |
| 10 | 02:45 | 39,1 | 58,9 |
| 11 | 03:00 | 40,8 | 60,6 |
| 12 | 03:15 | 40,9 | 64,1 |
| 13 | 03:30 | 40,1 | 60,9 |
| 14 | 03:45 | 39,3 | 61,6 |
| 15 | 04:00 | 39,0 | 62,5 |
| 16 | 04:15 | 39,1 | 61,0 |
| 17 | 04:30 | 37,7 | 56,6 |
| 18 | 04:45 | 39,5 | 61,9 |
| 19 | 05:00 | 40,3 | 60,8 |
| 20 | 05:15 | 39,8 | 60,3 |
| 21 | 05:30 | 40,1 | 63,1 |
| 22 | 05:45 | 40,4 | 59,1 |
| 23 | 06:00 | 38,1 | 59,1 |
| 24 | 06:15 | 38,2 | 56,5 |
| 25 | 06:30 | 40,3 | 57,3 |
| 26 | 06:45 | 41,6 | 60,4 |
| 27 | 07:00 | 47,3 | 61,3 |
| 28 | 07:15 | 48,6 | 62,9 |
| 29 | 07:30 | 48,3 | 64,0 |
| 30 | 07:45 | 47,3 | 64,2 |
| 31 | 08:00 | 46,2 | 65,3 |
| 32 | 08:15 | 51,4 | 70,3 |
| 33 | 08:30 | 49,6 | 70,8 |
| 34 | 08:45 | 53,8 | 68,5 |
| 35 | 09:00 | 52,4 | 71,5 |
| 36 | 09:15 | 50,5 | 69,3 |
| 37 | 09:30 | 52,4 | 72,0 |
| 38 | 09:45 | 51,5 | 70,4 |
| 39 | 10:00 | 54,6 | 71,2 |
| 40 | 10:15 | 55,0 | 72,8 |
| 41 | 10:30 | 54,1 | 71,8 |
| 42 | 10:45 | 50,7 | 75,2 |
| 43 | 11:00 | 53,6 | 70,8 |
| 44 | 11:15 | 53,2 | 68,2 |
| 45 | 11:30 | 52,6 | 67,8 |
| 46 | 11:45 | 53,5 | 69,2 |
| 47 | 12:00 | 53,1 | 68,2 |
| 48 | 12:15 | 49,9 | 69,2 |
| 49 | 12:30 | 53,2 | 69,5 |
| 50 | 12:45 | 49,6 | 71,1 |
| 51 | 13:00 | 49,9 | 73,6 |
| 52 | 13:15 | 50,2 | 73,4 |
| 53 | 13:30 | 51,5 | 74,7 |
| 54 | 13:45 | 52,3 | 69,8 |
| 55 | 14:00 | 50,8 | 76,2 |
| 56 | 14:15 | 52,9 | 73,7 |
| 57 | 14:30 | 53,4 | 72,6 |
| 58 | 14:45 | 54,8 | 72,1 |
| 59 | 15:00 | 50,9 | 73,4 |
| 60 | 15:15 | 51,3 | 73,5 |
| 61 | 15:30 | 53,7 | 75,2 |
| 62 | 15:45 | 50,3 | 72,8 |
| 63 | 16:00 | 51,7 | 74,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 64 | 16:15 | 52,1 | 75,4 |
| 65 | 16:30 | 53,7 | 70,0 |
| 66 | 16:45 | 50,8 | 72,6 |
| 67 | 17:00 | 53,0 | 71,7 |
| 68 | 17:15 | 52,4 | 70,6 |
| 69 | 17:30 | 50,9 | 75,9 |
| 70 | 17:45 | 52,1 | 74,3 |
| 71 | 18:00 | 52,8 | 71,1 |
| 72 | 18:15 | 47,9 | 71,7 |
| 73 | 18:30 | 46,5 | 72,0 |
| 74 | 18:45 | 42,0 | 65,5 |
| 75 | 19:00 | 42,7 | 65,5 |
| 76 | 19:15 | 39,2 | 62,6 |
| 77 | 19:30 | 39,4 | 62,7 |
| 78 | 19:45 | 41,2 | 65,5 |
| 79 | 20:00 | 40,4 | 66,1 |
| 80 | 20:15 | 38,5 | 61,6 |
| 81 | 20:30 | 39,9 | 65,1 |
| 82 | 20:45 | 38,3 | 62,9 |
| 83 | 21:00 | 39,8 | 64,5 |
| 84 | 21:15 | 37,8 | 58,9 |
| 85 | 21:30 | 38,3 | 61,9 |
| 86 | 21:45 | 39,0 | 60,0 |
| 87 | 22:00 | 40,4 | 61,8 |
| 88 | 22:15 | 39,7 | 63,2 |
| 89 | 22:30 | 41,0 | 64,4 |
| 90 | 22:45 | 39,2 | 60,1 |
| 91 | 23:00 | 42,3 | 58,2 |
| 92 | 23:15 | 40,1 | 68,7 |
| 93 | 23:30 | 44,2 | 64,5 |
| 94 | 23:45 | 45,0 | 66,2 |
| 95 | 00:00 | 42,9 | 66,3 |
| 96 | 00:15 | 41,6 | 65,6 |

**1.GÜN**
**26-27.09.2022**
**45.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,7 | 63,7 |
| 2 | 00:45 | 38,8 | 59,0 |
| 3 | 01:00 | 39,4 | 60,8 |
| 4 | 01:15 | 40,9 | 61,0 |
| 5 | 01:30 | 40,6 | 59,4 |
| 6 | 01:45 | 40,8 | 60,3 |
| 7 | 02:00 | 41,1 | 62,2 |
| 8 | 02:15 | 41,0 | 59,6 |
| 9 | 02:30 | 38,0 | 58,6 |
| 10 | 02:45 | 39,2 | 58,9 |
| 11 | 03:00 | 40,9 | 60,7 |
| 12 | 03:15 | 39,8 | 62,3 |
| 13 | 03:30 | 40,3 | 61,0 |
| 14 | 03:45 | 39,0 | 61,1 |
| 15 | 04:00 | 39,1 | 62,6 |
| 16 | 04:15 | 39,7 | 61,7 |
| 17 | 04:30 | 36,1 | 54,2 |
| 18 | 04:45 | 37,9 | 59,2 |
| 19 | 05:00 | 38,7 | 58,2 |
| 20 | 05:15 | 38,2 | 57,8 |
| 21 | 05:30 | 38,5 | 60,4 |
| 22 | 05:45 | 39,0 | 56,9 |
| 23 | 06:00 | 36,3 | 56,3 |
| 24 | 06:15 | 36,6 | 54,1 |
| 25 | 06:30 | 38,7 | 54,9 |
| 26 | 06:45 | 39,9 | 54,2 |
| 27 | 07:00 | 45,4 | 56,1 |
| 28 | 07:15 | 46,6 | 54,9 |
| 29 | 07:30 | 46,5 | 54,0 |
| 30 | 07:45 | 47,4 | 58,2 |
| 31 | 08:00 | 46,8 | 64,8 |
| 32 | 08:15 | 49,4 | 69,4 |
| 33 | 08:30 | 49,8 | 70,9 |
| 34 | 08:45 | 54,4 | 69,3 |
| 35 | 09:00 | 55,1 | 70,4 |
| 36 | 09:15 | 55,5 | 68,3 |
| 37 | 09:30 | 55,6 | 70,9 |
| 38 | 09:45 | 55,3 | 69,3 |
| 39 | 10:00 | 52,5 | 68,6 |
| 40 | 10:15 | 53,4 | 70,7 |
| 41 | 10:30 | 52,5 | 69,7 |
| 42 | 10:45 | 54,4 | 73,0 |
| 43 | 11:00 | 52,0 | 68,8 |
| 44 | 11:15 | 51,7 | 66,2 |
| 45 | 11:30 | 52,6 | 67,9 |
| 46 | 11:45 | 53,5 | 69,3 |
| 47 | 12:00 | 51,1 | 65,6 |
| 48 | 12:15 | 50,1 | 69,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 49 | 12:30 | 51,2 | 66,9 |
| 50 | 12:45 | 56,2 | 71,2 |
| 51 | 13:00 | 57,5 | 70,1 |
| 52 | 13:15 | 58,8 | 74,3 |
| 53 | 13:30 | 55,9 | 71,9 |
| 54 | 13:45 | 56,2 | 69,9 |
| 55 | 14:00 | 55,4 | 73,4 |
| 56 | 14:15 | 55,7 | 70,9 |
| 57 | 14:30 | 56,1 | 72,7 |
| 58 | 14:45 | 55,4 | 73,0 |
| 59 | 15:00 | 57,8 | 70,6 |
| 60 | 15:15 | 57,1 | 72,9 |
| 61 | 15:30 | 57,8 | 72,4 |
| 62 | 15:45 | 56,1 | 72,2 |
| 63 | 16:00 | 57,5 | 71,6 |
| 64 | 16:15 | 55,1 | 71,9 |
| 65 | 16:30 | 53,7 | 70,1 |
| 66 | 16:45 | 54,4 | 69,8 |
| 67 | 17:00 | 54,6 | 71,8 |
| 68 | 17:15 | 55,3 | 70,7 |
| 69 | 17:30 | 55,6 | 73,1 |
| 70 | 17:45 | 54,6 | 71,5 |
| 71 | 18:00 | 54,2 | 73,0 |
| 72 | 18:15 | 49,3 | 73,6 |
| 73 | 18:30 | 47,8 | 74,0 |
| 74 | 18:45 | 42,1 | 65,6 |
| 75 | 19:00 | 43,3 | 66,3 |
| 76 | 19:15 | 39,3 | 62,7 |
| 77 | 19:30 | 38,0 | 60,3 |
| 78 | 19:45 | 39,7 | 63,1 |
| 79 | 20:00 | 39,0 | 63,6 |
| 80 | 20:15 | 38,6 | 61,7 |
| 81 | 20:30 | 38,5 | 62,7 |
| 82 | 20:45 | 38,8 | 63,6 |
| 83 | 21:00 | 38,4 | 62,1 |
| 84 | 21:15 | 37,9 | 58,9 |
| 85 | 21:30 | 36,9 | 59,5 |
| 86 | 21:45 | 39,6 | 60,7 |
| 87 | 22:00 | 39,0 | 59,4 |
| 88 | 22:15 | 39,9 | 63,3 |
| 89 | 22:30 | 41,1 | 64,5 |
| 90 | 22:45 | 39,4 | 60,2 |
| 91 | 23:00 | 42,4 | 58,2 |
| 92 | 23:15 | 46,9 | 66,1 |
| 93 | 23:30 | 44,4 | 64,6 |
| 94 | 23:45 | 43,4 | 63,7 |
| 95 | 00:00 | 43,0 | 66,4 |
| 96 | 00:15 | 41,7 | 65,7 |

**1.GÜN**
**26-27.09.2022**
**46.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,5 | 63,5 |
| 2 | 00:45 | 38,2 | 58,3 |
| 3 | 01:00 | 38,1 | 58,7 |
| 4 | 01:15 | 39,5 | 58,9 |
| 5 | 01:30 | 40,1 | 58,6 |
| 6 | 01:45 | 39,3 | 58,3 |
| 7 | 02:00 | 40,1 | 60,7 |
| 8 | 02:15 | 40,4 | 58,9 |
| 9 | 02:30 | 39,1 | 60,1 |
| 10 | 02:45 | 38,6 | 58,2 |
| 11 | 03:00 | 40,3 | 59,9 |
| 12 | 03:15 | 40,4 | 63,3 |
| 13 | 03:30 | 39,6 | 60,1 |
| 14 | 03:45 | 39,3 | 61,5 |
| 15 | 04:00 | 39,0 | 62,3 |
| 16 | 04:15 | 39,2 | 60,8 |
| 17 | 04:30 | 37,5 | 56,5 |
| 18 | 04:45 | 39,5 | 61,8 |
| 19 | 05:00 | 40,3 | 60,7 |
| 20 | 05:15 | 39,9 | 60,1 |
| 21 | 05:30 | 40,1 | 62,9 |
| 22 | 05:45 | 40,5 | 59,0 |
| 23 | 06:00 | 38,0 | 59,0 |
| 24 | 06:15 | 38,0 | 56,3 |
| 25 | 06:30 | 40,4 | 57,3 |
| 26 | 06:45 | 41,6 | 56,4 |
| 27 | 07:00 | 47,3 | 58,4 |
| 28 | 07:15 | 48,7 | 57,3 |
| 29 | 07:30 | 48,3 | 56,0 |
| 30 | 07:45 | 47,3 | 58,1 |
| 31 | 08:00 | 46,1 | 63,9 |
| 32 | 08:15 | 48,7 | 68,6 |
| 33 | 08:30 | 47,1 | 67,1 |
| 34 | 08:45 | 48,9 | 65,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 35 | 09:00 | 50,6 | 67,7 |
| 36 | 09:15 | 49,5 | 65,7 |
| 37 | 09:30 | 49,6 | 68,2 |
| 38 | 09:45 | 53,2 | 66,8 |
| 39 | 10:00 | 49,2 | 67,6 |
| 40 | 10:15 | 50,1 | 69,1 |
| 41 | 10:30 | 48,9 | 68,1 |
| 42 | 10:45 | 49,5 | 71,4 |
| 43 | 11:00 | 50,9 | 67,2 |
| 44 | 11:15 | 50,4 | 64,7 |
| 45 | 11:30 | 49,9 | 64,2 |
| 46 | 11:45 | 50,8 | 65,6 |
| 47 | 12:00 | 50,3 | 64,7 |
| 48 | 12:15 | 47,4 | 65,6 |
| 49 | 12:30 | 50,4 | 65,9 |
| 50 | 12:45 | 47,9 | 67,4 |
| 51 | 13:00 | 50,6 | 69,8 |
| 52 | 13:15 | 50,4 | 69,6 |
| 53 | 13:30 | 49,3 | 73,9 |
| 54 | 13:45 | 50,7 | 69,0 |
| 55 | 14:00 | 51,0 | 75,3 |
| 56 | 14:15 | 50,5 | 72,8 |
| 57 | 14:30 | 50,6 | 71,6 |
| 58 | 14:45 | 48,8 | 71,2 |
| 59 | 15:00 | 50,1 | 72,6 |
| 60 | 15:15 | 51,0 | 72,7 |
| 61 | 15:30 | 50,8 | 74,4 |
| 62 | 15:45 | 48,0 | 71,9 |
| 63 | 16:00 | 47,6 | 73,5 |
| 64 | 16:15 | 50,5 | 74,6 |
| 65 | 16:30 | 49,6 | 69,2 |
| 66 | 16:45 | 50,3 | 71,6 |
| 67 | 17:00 | 50,1 | 70,8 |
| 68 | 17:15 | 49,7 | 69,7 |
| 69 | 17:30 | 49,1 | 75,8 |
| 70 | 17:45 | 51,0 | 74,1 |
| 71 | 18:00 | 49,3 | 70,9 |
| 72 | 18:15 | 47,9 | 71,5 |
| 73 | 18:30 | 46,6 | 72,0 |
| 74 | 18:45 | 41,8 | 65,2 |
| 75 | 19:00 | 42,8 | 65,4 |
| 76 | 19:15 | 39,2 | 62,4 |
| 77 | 19:30 | 39,4 | 62,4 |
| 78 | 19:45 | 41,2 | 65,4 |
| 79 | 20:00 | 40,5 | 65,9 |
| 80 | 20:15 | 38,4 | 61,4 |
| 81 | 20:30 | 39,9 | 65,0 |
| 82 | 20:45 | 38,3 | 62,7 |
| 83 | 21:00 | 39,8 | 64,3 |
| 84 | 21:15 | 37,6 | 58,7 |
| 85 | 21:30 | 38,2 | 61,8 |
| 86 | 21:45 | 39,1 | 59,8 |
| 87 | 22:00 | 40,5 | 61,6 |
| 88 | 22:15 | 39,9 | 63,1 |
| 89 | 22:30 | 41,0 | 64,3 |
| 90 | 22:45 | 39,4 | 59,9 |
| 91 | 23:00 | 42,2 | 58,0 |
| 92 | 23:15 | 48,7 | 68,6 |
| 93 | 23:30 | 44,2 | 64,5 |
| 94 | 23:45 | 45,0 | 66,1 |
| 95 | 00:00 | 42,9 | 66,1 |
| 96 | 00:15 | 41,5 | 65,4 |

**1.GÜN**
**26-27.09.2022**
**47.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,8 | 45,6 |
| 2 | 00:45 | 39,0 | 45,9 |
| 3 | 01:00 | 40,9 | 49,1 |
| 4 | 01:15 | 38,8 | 45,5 |
| 5 | 01:30 | 39,6 | 47,4 |
| 6 | 01:45 | 37,8 | 45,1 |
| 7 | 02:00 | 39,0 | 46,3 |
| 8 | 02:15 | 39,6 | 47,4 |
| 9 | 02:30 | 38,8 | 46,0 |
| 10 | 02:45 | 37,0 | 43,8 |
| 11 | 03:00 | 38,6 | 45,8 |
| 12 | 03:15 | 40,2 | 47,0 |
| 13 | 03:30 | 37,5 | 44,6 |
| 14 | 03:45 | 37,1 | 44,9 |
| 15 | 04:00 | 37,7 | 44,5 |
| 16 | 04:15 | 37,7 | 44,7 |
| 17 | 04:30 | 36,4 | 43,3 |
| 18 | 04:45 | 37,6 | 44,6 |
| 19 | 05:00 | 38,1 | 45,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 20 | 05:15 | 36,5 | 43,1 |
| 21 | 05:30 | 37,6 | 43,7 |
| 22 | 05:45 | 36,1 | 43,6 |
| 23 | 06:00 | 35,8 | 42,8 |
| 24 | 06:15 | 37,4 | 44,5 |
| 25 | 06:30 | 38,2 | 44,7 |
| 26 | 06:45 | 37,7 | 45,1 |
| 27 | 07:00 | 40,0 | 48,6 |
| 28 | 07:15 | 41,7 | 50,5 |
| 29 | 07:30 | 43,2 | 52,0 |
| 30 | 07:45 | 47,0 | 54,0 |
| 31 | 08:00 | 47,4 | 53,6 |
| 32 | 08:15 | 47,8 | 52,7 |
| 33 | 08:30 | 47,0 | 52,7 |
| 34 | 08:45 | 50,9 | 57,5 |
| 35 | 09:00 | 50,8 | 56,4 |
| 36 | 09:15 | 52,1 | 58,6 |
| 37 | 09:30 | 52,9 | 60,8 |
| 38 | 09:45 | 50,8 | 58,1 |
| 39 | 10:00 | 50,0 | 55,3 |
| 40 | 10:15 | 52,0 | 58,3 |
| 41 | 10:30 | 52,1 | 58,2 |
| 42 | 10:45 | 48,3 | 56,5 |
| 43 | 11:00 | 47,9 | 55,3 |
| 44 | 11:15 | 46,8 | 53,9 |
| 45 | 11:30 | 49,6 | 57,9 |
| 46 | 11:45 | 49,2 | 56,6 |
| 47 | 12:00 | 47,8 | 55,3 |
| 48 | 12:15 | 48,0 | 54,9 |
| 49 | 12:30 | 47,8 | 55,0 |
| 50 | 12:45 | 48,6 | 55,6 |
| 51 | 13:00 | 51,7 | 59,5 |
| 52 | 13:15 | 49,1 | 55,5 |
| 53 | 13:30 | 49,2 | 56,6 |
| 54 | 13:45 | 49,3 | 56,6 |
| 55 | 14:00 | 51,3 | 59,1 |
| 56 | 14:15 | 49,7 | 56,5 |
| 57 | 14:30 | 46,3 | 53,6 |
| 58 | 14:45 | 47,7 | 54,4 |
| 59 | 15:00 | 48,8 | 56,0 |
| 60 | 15:15 | 49,2 | 56,7 |
| 61 | 15:30 | 50,5 | 58,8 |
| 62 | 15:45 | 50,0 | 56,8 |
| 63 | 16:00 | 49,2 | 56,7 |
| 64 | 16:15 | 51,3 | 59,0 |
| 65 | 16:30 | 49,6 | 57,6 |
| 66 | 16:45 | 51,3 | 57,9 |
| 67 | 17:00 | 51,3 | 59,1 |
| 68 | 17:15 | 50,9 | 57,8 |
| 69 | 17:30 | 49,2 | 57,3 |
| 70 | 17:45 | 52,9 | 61,6 |
| 71 | 18:00 | 50,0 | 60,6 |
| 72 | 18:15 | 45,5 | 56,4 |
| 73 | 18:30 | 45,8 | 55,9 |
| 74 | 18:45 | 42,8 | 52,6 |
| 75 | 19:00 | 45,4 | 55,1 |
| 76 | 19:15 | 43,1 | 53,1 |
| 77 | 19:30 | 43,1 | 53,4 |
| 78 | 19:45 | 42,1 | 51,7 |
| 79 | 20:00 | 43,8 | 52,5 |
| 80 | 20:15 | 43,9 | 52,7 |
| 81 | 20:30 | 40,5 | 48,8 |
| 82 | 20:45 | 38,2 | 45,8 |
| 83 | 21:00 | 39,0 | 47,7 |
| 84 | 21:15 | 38,8 | 46,6 |
| 85 | 21:30 | 39,2 | 46,6 |
| 86 | 21:45 | 39,2 | 47,0 |
| 87 | 22:00 | 38,9 | 45,6 |
| 88 | 22:15 | 39,8 | 45,5 |
| 89 | 22:30 | 37,1 | 44,2 |
| 90 | 22:45 | 40,5 | 46,7 |
| 91 | 23:00 | 40,2 | 48,7 |
| 92 | 23:15 | 41,0 | 49,4 |
| 93 | 23:30 | 42,2 | 49,2 |
| 94 | 23:45 | 41,1 | 47,2 |
| 95 | 00:00 | 40,3 | 46,2 |
| 96 | 00:15 | 41,8 | 48,5 |

**1.GÜN**
**26-27.09.2022**
**48.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,1 | 55,8 |
| 2 | 00:45 | 39,1 | 56,6 |
| 3 | 01:00 | 40,0 | 58,3 |
| 4 | 01:15 | 41,2 | 58,6 |
| 5 | 01:30 | 42,0 | 60,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 6 | 01:45 | 42,0 | 60,3 | 50 | 12:45 | 59,3 | 73,6 |
| 7 | 02:00 | 42,4 | 61,0 | 51 | 13:00 | 58,1 | 74,1 |
| 8 | 02:15 | 42,3 | 58,9 | 52 | 13:15 | 58,3 | 76,0 |
| 9 | 02:30 | 39,1 | 56,6 | 53 | 13:30 | 58,0 | 73,5 |
| 10 | 02:45 | 40,3 | 58,9 | 54 | 13:45 | 59,5 | 76,0 |
| 11 | 03:00 | 42,1 | 61,3 | 55 | 14:00 | 58,6 | 76,5 |
| 12 | 03:15 | 40,9 | 61,0 | 56 | 14:15 | 56,4 | 75,3 |
| 13 | 03:30 | 41,4 | 59,8 | 57 | 14:30 | 56,3 | 76,9 |
| 14 | 03:45 | 40,7 | 59,1 | 58 | 14:45 | 59,6 | 76,6 |
| 15 | 04:00 | 40,7 | 61,4 | 59 | 15:00 | 59,5 | 78,3 |
| 16 | 04:15 | 41,5 | 59,2 | 60 | 15:15 | 59,0 | 75,1 |
| 17 | 04:30 | 37,7 | 54,5 | 61 | 15:30 | 61,4 | 76,6 |
| 18 | 04:45 | 39,5 | 55,8 | 62 | 15:45 | 60,5 | 77,6 |
| 19 | 05:00 | 40,5 | 54,9 | 63 | 16:00 | 61,4 | 79,4 |
| 20 | 05:15 | 39,0 | 57,3 | 64 | 16:15 | 61,0 | 76,8 |
| 21 | 05:30 | 39,1 | 56,7 | 65 | 16:30 | 60,5 | 74,1 |
| 22 | 05:45 | 39,9 | 56,4 | 66 | 16:45 | 56,9 | 75,9 |
| 23 | 06:00 | 37,0 | 52,6 | 67 | 17:00 | 57,4 | 76,8 |
| 24 | 06:15 | 37,2 | 54,8 | 68 | 17:15 | 58,0 | 73,9 |
| 25 | 06:30 | 37,7 | 53,2 | 69 | 17:30 | 60,1 | 78,3 |
| 26 | 06:45 | 37,2 | 54,8 | 70 | 17:45 | 60,7 | 79,6 |
| 27 | 07:00 | 45,6 | 62,8 | 71 | 18:00 | 60,1 | 78,3 |
| 28 | 07:15 | 47,0 | 65,0 | 72 | 18:15 | 52,7 | 71,0 |
| 29 | 07:30 | 45,6 | 63,1 | 73 | 18:30 | 50,6 | 72,8 |
| 30 | 07:45 | 46,1 | 64,0 | 74 | 18:45 | 47,0 | 65,7 |
| 31 | 08:00 | 46,1 | 64,3 | 75 | 19:00 | 45,6 | 66,9 |
| 32 | 08:15 | 45,6 | 62,0 | 76 | 19:15 | 41,1 | 62,3 |
| 33 | 08:30 | 46,8 | 64,7 | 77 | 19:30 | 40,0 | 58,1 |
| 34 | 08:45 | 52,6 | 69,5 | 78 | 19:45 | 40,3 | 61,0 |
| 35 | 09:00 | 54,3 | 71,6 | 79 | 20:00 | 40,5 | 61,5 |
| 36 | 09:15 | 53,8 | 71,8 | 80 | 20:15 | 40,0 | 62,3 |
| 37 | 09:30 | 53,7 | 71,6 | 81 | 20:30 | 40,0 | 61,3 |
| 38 | 09:45 | 53,3 | 71,4 | 82 | 20:45 | 40,3 | 60,1 |
| 39 | 10:00 | 52,7 | 65,9 | 83 | 21:00 | 39,9 | 59,9 |
| 40 | 10:15 | 52,5 | 68,9 | 84 | 21:15 | 39,4 | 56,9 |
| 41 | 10:30 | 53,0 | 66,8 | 85 | 21:30 | 38,4 | 55,7 |
| 42 | 10:45 | 54,2 | 70,9 | 86 | 21:45 | 41,2 | 58,3 |
| 43 | 11:00 | 52,2 | 68,2 | 87 | 22:00 | 40,3 | 59,1 |
| 44 | 11:15 | 53,4 | 68,8 | 88 | 22:15 | 41,4 | 61,1 |
| 45 | 11:30 | 54,3 | 69,7 | 89 | 22:30 | 42,6 | 61,4 |
| 46 | 11:45 | 55,1 | 71,5 | 90 | 22:45 | 40,7 | 57,2 |
| 47 | 12:00 | 52,2 | 66,7 | 91 | 23:00 | 44,0 | 61,6 |
| 48 | 12:15 | 52,0 | 68,5 | 92 | 23:15 | 45,6 | 68,7 |
| 49 | 12:30 | 53,4 | 69,2 | 93 | 23:30 | 45,3 | 65,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 94 | 23:45 | 44,9 | 66,8 |
| 95 | 00:00 | 44,4 | 65,9 |
| 96 | 00:15 | 44,7 | 65,2 |

**1.GÜN**
**26-27.09.2022**
**49.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,5 | 54,8 |
| 2 | 00:45 | 37,0 | 55,6 |
| 3 | 01:00 | 39,3 | 57,4 |
| 4 | 01:15 | 40,5 | 57,7 |
| 5 | 01:30 | 41,2 | 59,5 |
| 6 | 01:45 | 41,2 | 59,4 |
| 7 | 02:00 | 41,6 | 60,0 |
| 8 | 02:15 | 41,5 | 58,0 |
| 9 | 02:30 | 38,5 | 55,6 |
| 10 | 02:45 | 39,7 | 58,0 |
| 11 | 03:00 | 41,3 | 60,2 |
| 12 | 03:15 | 40,3 | 60,0 |
| 13 | 03:30 | 40,7 | 58,8 |
| 14 | 03:45 | 39,2 | 57,0 |
| 15 | 04:00 | 39,2 | 59,3 |
| 16 | 04:15 | 39,9 | 57,1 |
| 17 | 04:30 | 36,2 | 52,5 |
| 18 | 04:45 | 38,1 | 53,8 |
| 19 | 05:00 | 38,9 | 52,8 |
| 20 | 05:15 | 37,6 | 55,2 |
| 21 | 05:30 | 37,7 | 54,7 |
| 22 | 05:45 | 38,3 | 54,4 |
| 23 | 06:00 | 35,5 | 50,7 |
| 24 | 06:15 | 35,7 | 52,7 |
| 25 | 06:30 | 36,2 | 51,3 |
| 26 | 06:45 | 35,7 | 52,7 |
| 27 | 07:00 | 44,0 | 60,6 |
| 28 | 07:15 | 45,3 | 62,6 |
| 29 | 07:30 | 44,0 | 60,8 |
| 30 | 07:45 | 44,4 | 61,7 |
| 31 | 08:00 | 44,4 | 61,9 |
| 32 | 08:15 | 48,6 | 66,1 |
| 33 | 08:30 | 49,9 | 69,0 |
| 34 | 08:45 | 56,0 | 74,0 |
| 35 | 09:00 | 57,8 | 76,5 |
| 36 | 09:15 | 57,4 | 76,7 |
| 37 | 09:30 | 57,2 | 76,5 |
| 38 | 09:45 | 56,8 | 76,2 |
| 39 | 10:00 | 56,2 | 70,4 |
| 40 | 10:15 | 55,8 | 73,4 |
| 41 | 10:30 | 56,4 | 71,2 |
| 42 | 10:45 | 57,7 | 75,5 |
| 43 | 11:00 | 55,6 | 72,7 |
| 44 | 11:15 | 56,9 | 73,3 |
| 45 | 11:30 | 57,8 | 74,1 |
| 46 | 11:45 | 58,7 | 76,4 |
| 47 | 12:00 | 55,6 | 71,1 |
| 48 | 12:15 | 55,3 | 72,9 |
| 49 | 12:30 | 56,9 | 73,6 |
| 50 | 12:45 | 63,2 | 78,5 |
| 51 | 13:00 | 61,9 | 79,0 |
| 52 | 13:15 | 62,0 | 81,1 |
| 53 | 13:30 | 57,1 | 72,3 |
| 54 | 13:45 | 58,6 | 74,8 |
| 55 | 14:00 | 57,7 | 75,4 |
| 56 | 14:15 | 55,4 | 74,1 |
| 57 | 14:30 | 55,3 | 75,8 |
| 58 | 14:45 | 58,6 | 75,5 |
| 59 | 15:00 | 58,6 | 77,1 |
| 60 | 15:15 | 58,1 | 73,9 |
| 61 | 15:30 | 60,3 | 75,5 |
| 62 | 15:45 | 59,6 | 76,4 |
| 63 | 16:00 | 60,3 | 78,0 |
| 64 | 16:15 | 60,0 | 75,6 |
| 65 | 16:30 | 59,6 | 72,9 |
| 66 | 16:45 | 56,0 | 74,7 |
| 67 | 17:00 | 56,5 | 75,6 |
| 68 | 17:15 | 57,1 | 72,7 |
| 69 | 17:30 | 57,8 | 75,5 |
| 70 | 17:45 | 58,4 | 76,7 |
| 71 | 18:00 | 57,8 | 75,5 |
| 72 | 18:15 | 50,8 | 68,5 |
| 73 | 18:30 | 48,7 | 70,3 |
| 74 | 18:45 | 45,3 | 63,2 |
| 75 | 19:00 | 44,0 | 64,5 |
| 76 | 19:15 | 39,4 | 60,1 |
| 77 | 19:30 | 38,5 | 56,0 |
| 78 | 19:45 | 38,8 | 58,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 79 | 20:00 | 38,9 | 59,3 |
| 80 | 20:15 | 38,5 | 60,1 |
| 81 | 20:30 | 38,5 | 59,1 |
| 82 | 20:45 | 38,8 | 57,8 |
| 83 | 21:00 | 38,3 | 57,7 |
| 84 | 21:15 | 38,0 | 55,0 |
| 85 | 21:30 | 36,9 | 53,5 |
| 86 | 21:45 | 39,5 | 56,2 |
| 87 | 22:00 | 38,8 | 57,0 |
| 88 | 22:15 | 39,8 | 59,0 |
| 89 | 22:30 | 41,1 | 59,3 |
| 90 | 22:45 | 39,2 | 55,2 |
| 91 | 23:00 | 42,3 | 59,4 |
| 92 | 23:15 | 44,0 | 66,2 |
| 93 | 23:30 | 43,6 | 63,1 |
| 94 | 23:45 | 41,6 | 64,4 |
| 95 | 00:00 | 42,7 | 63,5 |
| 96 | 00:15 | 42,4 | 62,9 |

**1.GÜN**
**26-27.09.2022**
**50.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 45,6 | 58,0 |
| 2 | 00:45 | 43,7 | 56,2 |
| 3 | 01:00 | 44,6 | 59,0 |
| 4 | 01:15 | 43,7 | 61,2 |
| 5 | 01:30 | 44,2 | 57,6 |
| 6 | 01:45 | 43,9 | 56,1 |
| 7 | 02:00 | 43,3 | 53,5 |
| 8 | 02:15 | 42,7 | 60,6 |
| 9 | 02:30 | 42,0 | 56,3 |
| 10 | 02:45 | 43,6 | 58,9 |
| 11 | 03:00 | 43,7 | 53,3 |
| 12 | 03:15 | 43,9 | 56,5 |
| 13 | 03:30 | 44,3 | 59,7 |
| 14 | 03:45 | 43,9 | 61,7 |
| 15 | 04:00 | 44,1 | 57,6 |
| 16 | 04:15 | 44,3 | 59,6 |
| 17 | 04:30 | 43,7 | 61,3 |
| 18 | 04:45 | 45,0 | 59,0 |
| 19 | 05:00 | 44,1 | 53,7 |
| 20 | 05:15 | 43,5 | 53,3 |
| 21 | 05:30 | 43,2 | 51,4 |
| 22 | 05:45 | 41,3 | 50,9 |
| 23 | 06:00 | 40,9 | 53,5 |
| 24 | 06:15 | 40,2 | 50,0 |
| 25 | 06:30 | 42,1 | 50,9 |
| 26 | 06:45 | 42,0 | 48,0 |
| 27 | 07:00 | 42,0 | 55,7 |
| 28 | 07:15 | 41,5 | 52,1 |
| 29 | 07:30 | 44,9 | 54,0 |
| 30 | 07:45 | 48,5 | 54,6 |
| 31 | 08:00 | 49,1 | 51,7 |
| 32 | 08:15 | 47,9 | 54,0 |
| 33 | 08:30 | 48,2 | 51,6 |
| 34 | 08:45 | 48,5 | 53,7 |
| 35 | 09:00 | 48,8 | 54,9 |
| 36 | 09:15 | 49,1 | 56,8 |
| 37 | 09:30 | 49,5 | 58,2 |
| 38 | 09:45 | 50,0 | 54,9 |
| 39 | 10:00 | 51,3 | 57,5 |
| 40 | 10:15 | 51,0 | 53,9 |
| 41 | 10:30 | 51,6 | 57,1 |
| 42 | 10:45 | 52,2 | 54,7 |
| 43 | 11:00 | 51,8 | 57,0 |
| 44 | 11:15 | 51,5 | 57,6 |
| 45 | 11:30 | 51,0 | 59,2 |
| 46 | 11:45 | 52,2 | 56,0 |
| 47 | 12:00 | 51,8 | 54,0 |
| 48 | 12:15 | 52,6 | 56,1 |
| 49 | 12:30 | 52,8 | 57,6 |
| 50 | 12:45 | 53,0 | 58,2 |
| 51 | 13:00 | 52,4 | 59,9 |
| 52 | 13:15 | 51,7 | 57,0 |
| 53 | 13:30 | 51,6 | 55,4 |
| 54 | 13:45 | 51,1 | 57,8 |
| 55 | 14:00 | 51,4 | 54,6 |
| 56 | 14:15 | 50,6 | 57,1 |
| 57 | 14:30 | 49,2 | 54,0 |
| 58 | 14:45 | 49,5 | 55,4 |
| 59 | 15:00 | 50,0 | 57,6 |
| 60 | 15:15 | 50,0 | 57,0 |
| 61 | 15:30 | 50,1 | 54,1 |
| 62 | 15:45 | 49,9 | 52,9 |
| 63 | 16:00 | 50,3 | 57,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 64 | 16:15 | 50,0 | 54,7 |
| 65 | 16:30 | 50,0 | 56,0 |
| 66 | 16:45 | 50,4 | 55,1 |
| 67 | 17:00 | 51,1 | 56,0 |
| 68 | 17:15 | 50,8 | 53,5 |
| 69 | 17:30 | 49,5 | 56,1 |
| 70 | 17:45 | 49,9 | 57,5 |
| 71 | 18:00 | 50,1 | 58,3 |
| 72 | 18:15 | 50,0 | 58,0 |
| 73 | 18:30 | 50,2 | 62,6 |
| 74 | 18:45 | 51,3 | 62,0 |
| 75 | 19:00 | 50,8 | 60,0 |
| 76 | 19:15 | 50,4 | 55,2 |
| 77 | 19:30 | 50,9 | 61,2 |
| 78 | 19:45 | 50,8 | 62,6 |
| 79 | 20:00 | 51,8 | 57,5 |
| 80 | 20:15 | 45,0 | 58,9 |
| 81 | 20:30 | 44,7 | 60,6 |
| 82 | 20:45 | 45,7 | 57,0 |
| 83 | 21:00 | 44,9 | 51,3 |
| 84 | 21:15 | 45,4 | 53,2 |
| 85 | 21:30 | 43,5 | 55,1 |
| 86 | 21:45 | 44,6 | 54,7 |
| 87 | 22:00 | 43,5 | 53,1 |
| 88 | 22:15 | 45,9 | 53,8 |
| 89 | 22:30 | 43,7 | 55,4 |
| 90 | 22:45 | 42,6 | 58,5 |
| 91 | 23:00 | 43,3 | 56,3 |
| 92 | 23:15 | 43,2 | 54,5 |
| 93 | 23:30 | 40,6 | 57,4 |
| 94 | 23:45 | 44,7 | 54,5 |
| 95 | 00:00 | 44,1 | 57,7 |
| 96 | 00:15 | 45,9 | 54,9 |

**1.GÜN**
**29-30.09.2022**
**51.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,0 | 50,7 |
| 2 | 00:45 | 41,8 | 53,6 |
| 3 | 01:00 | 38,7 | 51,7 |
| 4 | 01:15 | 40,5 | 52,9 |
| 5 | 01:30 | 40,1 | 51,7 |
| 6 | 01:45 | 40,6 | 52,5 |
| 7 | 02:00 | 38,6 | 51,1 |
| 8 | 02:15 | 41,8 | 52,8 |
| 9 | 02:30 | 41,7 | 49,5 |
| 10 | 02:45 | 39,4 | 50,7 |
| 11 | 03:00 | 39,3 | 51,7 |
| 12 | 03:15 | 42,1 | 50,4 |
| 13 | 03:30 | 41,0 | 55,0 |
| 14 | 03:45 | 40,2 | 51,0 |
| 15 | 04:00 | 41,0 | 55,1 |
| 16 | 04:15 | 38,3 | 54,9 |
| 17 | 04:30 | 43,1 | 56,6 |
| 18 | 04:45 | 41,5 | 51,8 |
| 19 | 05:00 | 42,8 | 54,5 |
| 20 | 05:15 | 40,7 | 52,2 |
| 21 | 05:30 | 40,2 | 52,1 |
| 22 | 05:45 | 39,8 | 52,5 |
| 23 | 06:00 | 38,9 | 48,4 |
| 24 | 06:15 | 37,4 | 49,0 |
| 25 | 06:30 | 41,7 | 53,0 |
| 26 | 06:45 | 38,6 | 46,8 |
| 27 | 07:00 | 39,2 | 50,0 |
| 28 | 07:15 | 42,4 | 52,1 |
| 29 | 07:30 | 42,9 | 49,8 |
| 30 | 07:45 | 45,0 | 54,0 |
| 31 | 08:00 | 45,0 | 54,6 |
| 32 | 08:15 | 47,2 | 54,3 |
| 33 | 08:30 | 47,6 | 54,3 |
| 34 | 08:45 | 48,3 | 57,7 |
| 35 | 09:00 | 49,6 | 59,6 |
| 36 | 09:15 | 51,7 | 63,1 |
| 37 | 09:30 | 51,0 | 59,0 |
| 38 | 09:45 | 52,1 | 60,1 |
| 39 | 10:00 | 54,1 | 59,4 |
| 40 | 10:15 | 51,8 | 59,0 |
| 41 | 10:30 | 52,4 | 61,1 |
| 42 | 10:45 | 49,3 | 61,5 |
| 43 | 11:00 | 49,2 | 57,2 |
| 44 | 11:15 | 51,3 | 58,2 |
| 45 | 11:30 | 49,2 | 57,6 |
| 46 | 11:45 | 51,0 | 63,6 |
| 47 | 12:00 | 51,1 | 57,8 |
| 48 | 12:15 | 51,8 | 62,9 |
| 49 | 12:30 | 52,7 | 59,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 50 | 12:45 | 52,0 | 60,3 |
| 51 | 13:00 | 53,2 | 60,4 |
| 52 | 13:15 | 52,7 | 64,8 |
| 53 | 13:30 | 53,7 | 64,4 |
| 54 | 13:45 | 49,5 | 62,6 |
| 55 | 14:00 | 53,8 | 61,1 |
| 56 | 14:15 | 51,2 | 61,4 |
| 57 | 14:30 | 53,0 | 62,7 |
| 58 | 14:45 | 49,5 | 63,3 |
| 59 | 15:00 | 52,4 | 63,4 |
| 60 | 15:15 | 51,7 | 65,0 |
| 61 | 15:30 | 52,3 | 64,1 |
| 62 | 15:45 | 52,7 | 64,6 |
| 63 | 16:00 | 53,1 | 64,1 |
| 64 | 16:15 | 51,7 | 65,0 |
| 65 | 16:30 | 54,2 | 65,9 |
| 66 | 16:45 | 53,8 | 63,8 |
| 67 | 17:00 | 51,9 | 66,1 |
| 68 | 17:15 | 52,3 | 64,6 |
| 69 | 17:30 | 51,0 | 69,0 |
| 70 | 17:45 | 54,1 | 67,5 |
| 71 | 18:00 | 45,8 | 68,2 |
| 72 | 18:15 | 46,4 | 64,0 |
| 73 | 18:30 | 42,0 | 60,1 |
| 74 | 18:45 | 44,3 | 58,5 |
| 75 | 19:00 | 41,7 | 57,2 |
| 76 | 19:15 | 41,2 | 54,4 |
| 77 | 19:30 | 44,8 | 56,1 |
| 78 | 19:45 | 42,1 | 54,4 |
| 79 | 20:00 | 40,5 | 51,7 |
| 80 | 20:15 | 39,3 | 50,4 |
| 81 | 20:30 | 41,0 | 54,0 |
| 82 | 20:45 | 37,0 | 49,1 |
| 83 | 21:00 | 40,6 | 49,1 |
| 84 | 21:15 | 37,6 | 50,3 |
| 85 | 21:30 | 40,5 | 50,3 |
| 86 | 21:45 | 39,0 | 49,8 |
| 87 | 22:00 | 40,4 | 50,6 |
| 88 | 22:15 | 39,3 | 49,8 |
| 89 | 22:30 | 39,4 | 49,0 |
| 90 | 22:45 | 42,5 | 49,2 |
| 91 | 23:00 | 43,2 | 53,4 |
| 92 | 23:15 | 44,4 | 53,9 |
| 93 | 23:30 | 40,0 | 55,2 |
| 94 | 23:45 | 40,8 | 50,4 |
| 95 | 00:00 | 40,8 | 51,8 |
| 96 | 00:15 | 36,5 | 49,8 |

**1.GÜN**
**29-30.09.2022**
**52.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,1 | 47,0 |
| 2 | 00:45 | 39,8 | 47,5 |
| 3 | 01:00 | 40,3 | 45,9 |
| 4 | 01:15 | 40,3 | 47,5 |
| 5 | 01:30 | 40,4 | 49,2 |
| 6 | 01:45 | 38,3 | 45,0 |
| 7 | 02:00 | 41,6 | 50,4 |
| 8 | 02:15 | 39,1 | 46,0 |
| 9 | 02:30 | 39,5 | 45,5 |
| 10 | 02:45 | 40,5 | 49,1 |
| 11 | 03:00 | 43,1 | 50,0 |
| 12 | 03:15 | 41,5 | 52,2 |
| 13 | 03:30 | 39,9 | 48,7 |
| 14 | 03:45 | 41,2 | 50,4 |
| 15 | 04:00 | 39,5 | 48,9 |
| 16 | 04:15 | 42,0 | 49,5 |
| 17 | 04:30 | 38,6 | 48,0 |
| 18 | 04:45 | 41,2 | 50,8 |
| 19 | 05:00 | 37,7 | 45,3 |
| 20 | 05:15 | 38,7 | 48,7 |
| 21 | 05:30 | 37,9 | 45,8 |
| 22 | 05:45 | 36,1 | 45,0 |
| 23 | 06:00 | 37,3 | 45,7 |
| 24 | 06:15 | 40,3 | 49,0 |
| 25 | 06:30 | 39,8 | 48,8 |
| 26 | 06:45 | 42,2 | 51,6 |
| 27 | 07:00 | 44,1 | 53,2 |
| 28 | 07:15 | 43,1 | 54,0 |
| 29 | 07:30 | 47,2 | 55,3 |
| 30 | 07:45 | 50,6 | 56,9 |
| 31 | 08:00 | 50,6 | 58,9 |
| 32 | 08:15 | 50,2 | 59,1 |
| 33 | 08:30 | 50,3 | 60,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 34 | 08:45 | 52,0 | 59,5 |
| 35 | 09:00 | 53,3 | 60,8 |
| 36 | 09:15 | 52,1 | 60,4 |
| 37 | 09:30 | 49,8 | 56,0 |
| 38 | 09:45 | 49,8 | 56,7 |
| 39 | 10:00 | 51,1 | 59,1 |
| 40 | 10:15 | 53,3 | 59,3 |
| 41 | 10:30 | 49,5 | 60,5 |
| 42 | 10:45 | 48,1 | 58,9 |
| 43 | 11:00 | 48,6 | 56,5 |
| 44 | 11:15 | 49,2 | 57,3 |
| 45 | 11:30 | 49,8 | 57,7 |
| 46 | 11:45 | 46,4 | 53,2 |
| 47 | 12:00 | 48,3 | 54,2 |
| 48 | 12:15 | 47,0 | 53,7 |
| 49 | 12:30 | 49,3 | 54,0 |
| 50 | 12:45 | 51,3 | 56,4 |
| 51 | 13:00 | 51,3 | 57,0 |
| 52 | 13:15 | 52,9 | 57,3 |
| 53 | 13:30 | 50,7 | 56,3 |
| 54 | 13:45 | 50,5 | 56,6 |
| 55 | 14:00 | 51,4 | 58,1 |
| 56 | 14:15 | 52,8 | 58,3 |
| 57 | 14:30 | 49,1 | 60,6 |
| 58 | 14:45 | 52,2 | 59,3 |
| 59 | 15:00 | 51,9 | 57,4 |
| 60 | 15:15 | 50,5 | 57,3 |
| 61 | 15:30 | 47,6 | 58,7 |
| 62 | 15:45 | 48,4 | 54,5 |
| 63 | 16:00 | 52,0 | 55,5 |
| 64 | 16:15 | 48,7 | 54,0 |
| 65 | 16:30 | 47,4 | 53,3 |
| 66 | 16:45 | 48,5 | 55,6 |
| 67 | 17:00 | 48,0 | 54,3 |
| 68 | 17:15 | 50,7 | 57,7 |
| 69 | 17:30 | 51,5 | 58,4 |
| 70 | 17:45 | 50,0 | 59,5 |
| 71 | 18:00 | 50,7 | 60,8 |
| 72 | 18:15 | 49,0 | 57,5 |
| 73 | 18:30 | 45,8 | 53,9 |
| 74 | 18:45 | 46,3 | 55,7 |
| 75 | 19:00 | 45,0 | 52,9 |
| 76 | 19:15 | 47,4 | 53,8 |
| 77 | 19:30 | 47,3 | 55,0 |
| 78 | 19:45 | 45,5 | 51,9 |
| 79 | 20:00 | 44,5 | 52,4 |
| 80 | 20:15 | 43,4 | 52,4 |
| 81 | 20:30 | 40,9 | 47,4 |
| 82 | 20:45 | 41,3 | 48,9 |
| 83 | 21:00 | 40,0 | 47,4 |
| 84 | 21:15 | 44,0 | 50,6 |
| 85 | 21:30 | 43,3 | 51,9 |
| 86 | 21:45 | 41,1 | 49,1 |
| 87 | 22:00 | 42,2 | 49,9 |
| 88 | 22:15 | 41,1 | 49,0 |
| 89 | 22:30 | 44,1 | 51,8 |
| 90 | 22:45 | 41,6 | 48,6 |
| 91 | 23:00 | 42,4 | 50,2 |
| 92 | 23:15 | 42,5 | 50,1 |
| 93 | 23:30 | 38,9 | 47,2 |
| 94 | 23:45 | 40,1 | 48,0 |
| 95 | 00:00 | 41,8 | 49,8 |
| 96 | 00:15 | 43,2 | 54,6 |

**1.GÜN**
**29-30.09.2022**
**53.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,8 | 52,6 |
| 2 | 00:45 | 40,6 | 57,8 |
| 3 | 01:00 | 40,6 | 58,2 |
| 4 | 01:15 | 41,0 | 59,4 |
| 5 | 01:30 | 42,3 | 57,6 |
| 6 | 01:45 | 42,2 | 59,9 |
| 7 | 02:00 | 40,4 | 54,9 |
| 8 | 02:15 | 45,2 | 62,4 |
| 9 | 02:30 | 42,7 | 56,3 |
| 10 | 02:45 | 42,2 | 57,1 |
| 11 | 03:00 | 43,3 | 58,7 |
| 12 | 03:15 | 43,9 | 56,3 |
| 13 | 03:30 | 42,1 | 56,8 |
| 14 | 03:45 | 40,1 | 54,6 |
| 15 | 04:00 | 40,2 | 54,5 |
| 16 | 04:15 | 41,6 | 55,2 |
| 17 | 04:30 | 42,8 | 55,7 |
| 18 | 04:45 | 39,4 | 52,0 |
| 19 | 05:00 | 40,2 | 53,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 20 | 05:15 | 38,8 | 50,1 |
| 21 | 05:30 | 37,6 | 49,2 |
| 22 | 05:45 | 36,5 | 48,1 |
| 23 | 06:00 | 38,1 | 49,2 |
| 24 | 06:15 | 39,1 | 51,7 |
| 25 | 06:30 | 37,8 | 49,8 |
| 26 | 06:45 | 35,9 | 53,3 |
| 27 | 07:00 | 38,0 | 55,2 |
| 28 | 07:15 | 39,3 | 57,3 |
| 29 | 07:30 | 41,2 | 52,4 |
| 30 | 07:45 | 45,2 | 53,2 |
| 31 | 08:00 | 45,5 | 55,2 |
| 32 | 08:15 | 50,0 | 61,2 |
| 33 | 08:30 | 50,3 | 58,2 |
| 34 | 08:45 | 51,3 | 58,5 |
| 35 | 09:00 | 52,4 | 61,4 |
| 36 | 09:15 | 51,3 | 60,3 |
| 37 | 09:30 | 50,1 | 55,8 |
| 38 | 09:45 | 47,7 | 53,0 |
| 39 | 10:00 | 48,0 | 56,7 |
| 40 | 10:15 | 48,3 | 55,4 |
| 41 | 10:30 | 48,7 | 57,5 |
| 42 | 10:45 | 46,5 | 55,2 |
| 43 | 11:00 | 47,5 | 54,0 |
| 44 | 11:15 | 47,6 | 55,4 |
| 45 | 11:30 | 47,0 | 57,1 |
| 46 | 11:45 | 47,2 | 56,3 |
| 47 | 12:00 | 44,1 | 52,0 |
| 48 | 12:15 | 46,3 | 52,8 |
| 49 | 12:30 | 44,6 | 53,3 |
| 50 | 12:45 | 45,4 | 58,3 |
| 51 | 13:00 | 48,9 | 57,1 |
| 52 | 13:15 | 48,3 | 58,3 |
| 53 | 13:30 | 50,1 | 57,7 |
| 54 | 13:45 | 48,3 | 54,8 |
| 55 | 14:00 | 48,5 | 54,4 |
| 56 | 14:15 | 49,9 | 57,0 |
| 57 | 14:30 | 51,6 | 58,6 |
| 58 | 14:45 | 45,9 | 56,7 |
| 59 | 15:00 | 49,4 | 58,9 |
| 60 | 15:15 | 49,8 | 56,1 |
| 61 | 15:30 | 49,9 | 53,5 |
| 62 | 15:45 | 47,4 | 57,3 |
| 63 | 16:00 | 47,8 | 54,6 |
| 64 | 16:15 | 50,0 | 55,9 |
| 65 | 16:30 | 47,3 | 52,8 |
| 66 | 16:45 | 46,9 | 52,2 |
| 67 | 17:00 | 48,0 | 57,5 |
| 68 | 17:15 | 48,0 | 55,3 |
| 69 | 17:30 | 48,1 | 59,4 |
| 70 | 17:45 | 45,9 | 56,4 |
| 71 | 18:00 | 46,3 | 59,4 |
| 72 | 18:15 | 49,3 | 64,3 |
| 73 | 18:30 | 48,3 | 59,6 |
| 74 | 18:45 | 46,3 | 58,9 |
| 75 | 19:00 | 47,1 | 60,8 |
| 76 | 19:15 | 46,5 | 56,9 |
| 77 | 19:30 | 48,6 | 61,6 |
| 78 | 19:45 | 49,9 | 62,9 |
| 79 | 20:00 | 41,3 | 56,5 |
| 80 | 20:15 | 42,0 | 55,2 |
| 81 | 20:30 | 40,6 | 53,6 |
| 82 | 20:45 | 38,0 | 52,5 |
| 83 | 21:00 | 38,8 | 54,0 |
| 84 | 21:15 | 37,9 | 54,6 |
| 85 | 21:30 | 40,2 | 55,6 |
| 86 | 21:45 | 38,0 | 55,9 |
| 87 | 22:00 | 37,2 | 55,4 |
| 88 | 22:15 | 39,9 | 54,9 |
| 89 | 22:30 | 42,2 | 54,9 |
| 90 | 22:45 | 45,3 | 55,7 |
| 91 | 23:00 | 41,1 | 54,2 |
| 92 | 23:15 | 39,3 | 55,9 |
| 93 | 23:30 | 40,0 | 53,9 |
| 94 | 23:45 | 38,5 | 51,1 |
| 95 | 00:00 | 38,1 | 52,2 |
| 96 | 00:15 | 40,3 | 55,0 |

**1.GÜN**
**29-30.09.2022**
**54.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,6 | 58,5 |
| 2 | 00:45 | 39,3 | 53,3 |
| 3 | 01:00 | 36,8 | 52,5 |
| 4 | 01:15 | 38,2 | 52,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | 01:30 | 39,6 | 53,6 | 49 | 12:30 | 53,0 | 68,8 |
| 6 | 01:45 | 38,1 | 52,3 | 50 | 12:45 | 50,6 | 67,6 |
| 7 | 02:00 | 39,3 | 54,9 | 51 | 13:00 | 49,9 | 73,4 |
| 8 | 02:15 | 40,0 | 53,8 | 52 | 13:15 | 51,2 | 69,0 |
| 9 | 02:30 | 40,1 | 57,3 | 53 | 13:30 | 50,6 | 71,1 |
| 10 | 02:45 | 38,1 | 53,2 | 54 | 13:45 | 52,4 | 63,7 |
| 11 | 03:00 | 39,8 | 54,8 | 55 | 14:00 | 51,1 | 72,5 |
| 12 | 03:15 | 41,3 | 59,5 | 56 | 14:15 | 51,5 | 70,0 |
| 13 | 03:30 | 39,1 | 55,0 | 57 | 14:30 | 52,3 | 66,3 |
| 14 | 03:45 | 38,5 | 55,7 | 58 | 14:45 | 53,4 | 65,2 |
| 15 | 04:00 | 37,8 | 55,8 | 59 | 15:00 | 52,8 | 69,7 |
| 16 | 04:15 | 37,6 | 54,0 | 60 | 15:15 | 53,5 | 67,9 |
| 17 | 04:30 | 38,1 | 52,9 | 61 | 15:30 | 53,8 | 71,4 |
| 18 | 04:45 | 39,9 | 57,8 | 62 | 15:45 | 52,2 | 67,2 |
| 19 | 05:00 | 40,9 | 56,7 | 63 | 16:00 | 51,0 | 70,7 |
| 20 | 05:15 | 40,3 | 56,4 | 64 | 16:15 | 50,1 | 72,5 |
| 21 | 05:30 | 40,7 | 58,9 | 65 | 16:30 | 53,2 | 63,9 |
| 22 | 05:45 | 40,8 | 55,0 | 66 | 16:45 | 51,3 | 69,0 |
| 23 | 06:00 | 38,8 | 55,5 | 67 | 17:00 | 49,8 | 65,5 |
| 24 | 06:15 | 38,6 | 57,5 | 68 | 17:15 | 52,2 | 64,5 |
| 25 | 06:30 | 41,5 | 58,3 | 69 | 17:30 | 51,4 | 71,4 |
| 26 | 06:45 | 42,6 | 56,0 | 70 | 17:45 | 50,9 | 69,7 |
| 27 | 07:00 | 48,3 | 59,8 | 71 | 18:00 | 50,4 | 62,6 |
| 28 | 07:15 | 49,8 | 57,2 | 72 | 18:15 | 45,6 | 63,2 |
| 29 | 07:30 | 49,2 | 56,4 | 73 | 18:30 | 44,4 | 63,6 |
| 30 | 07:45 | 46,3 | 54,6 | 74 | 18:45 | 41,0 | 58,9 |
| 31 | 08:00 | 48,2 | 57,2 | 75 | 19:00 | 41,5 | 58,5 |
| 32 | 08:15 | 49,9 | 61,0 | 76 | 19:15 | 38,5 | 56,7 |
| 33 | 08:30 | 51,0 | 60,6 | 77 | 19:30 | 40,1 | 58,8 |
| 34 | 08:45 | 51,8 | 61,0 | 78 | 19:45 | 42,1 | 61,6 |
| 35 | 09:00 | 51,4 | 63,4 | 79 | 20:00 | 41,4 | 62,2 |
| 36 | 09:15 | 50,8 | 64,3 | 80 | 20:15 | 37,7 | 55,6 |
| 37 | 09:30 | 51,2 | 62,7 | 81 | 20:30 | 40,7 | 61,3 |
| 38 | 09:45 | 51,4 | 64,9 | 82 | 20:45 | 37,3 | 56,2 |
| 39 | 10:00 | 50,6 | 67,6 | 83 | 21:00 | 40,5 | 60,5 |
| 40 | 10:15 | 51,5 | 71,3 | 84 | 21:15 | 36,9 | 53,2 |
| 41 | 10:30 | 50,6 | 70,5 | 85 | 21:30 | 38,9 | 58,1 |
| 42 | 10:45 | 51,4 | 73,8 | 86 | 21:45 | 37,2 | 52,6 |
| 43 | 11:00 | 53,0 | 69,5 | 87 | 22:00 | 40,3 | 56,9 |
| 44 | 11:15 | 53,5 | 66,9 | 88 | 22:15 | 38,3 | 56,0 |
| 45 | 11:30 | 54,1 | 64,2 | 89 | 22:30 | 39,2 | 57,1 |
| 46 | 11:45 | 52,0 | 65,9 | 90 | 22:45 | 37,8 | 53,2 |
| 47 | 12:00 | 52,9 | 67,5 | 91 | 23:00 | 40,5 | 51,5 |
| 48 | 12:15 | 54,4 | 65,9 | 92 | 23:15 | 45,2 | 52,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 93 | 23:30 | 42,5 | 57,1 |
| 94 | 23:45 | 45,0 | 61,0 |
| 95 | 00:00 | 41,3 | 58,7 |
| 96 | 00:15 | 39,8 | 57,9 |

**1.GÜN**
**29-30.09.2022**
**55.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 36,9 | 58,2 |
| 2 | 00:45 | 36,6 | 53,3 |
| 3 | 01:00 | 36,4 | 53,7 |
| 4 | 01:15 | 37,7 | 53,9 |
| 5 | 01:30 | 38,3 | 53,6 |
| 6 | 01:45 | 37,6 | 53,2 |
| 7 | 02:00 | 38,3 | 55,5 |
| 8 | 02:15 | 38,6 | 53,9 |
| 9 | 02:30 | 37,2 | 55,2 |
| 10 | 02:45 | 36,9 | 53,2 |
| 11 | 03:00 | 38,5 | 54,7 |
| 12 | 03:15 | 38,6 | 57,9 |
| 13 | 03:30 | 37,8 | 55,0 |
| 14 | 03:45 | 36,8 | 55,1 |
| 15 | 04:00 | 36,5 | 55,8 |
| 16 | 04:15 | 36,7 | 54,5 |
| 17 | 04:30 | 35,1 | 50,6 |
| 18 | 04:45 | 36,9 | 55,3 |
| 19 | 05:00 | 37,7 | 54,4 |
| 20 | 05:15 | 37,2 | 53,9 |
| 21 | 05:30 | 37,5 | 56,4 |
| 22 | 05:45 | 37,8 | 52,8 |
| 23 | 06:00 | 35,5 | 52,8 |
| 24 | 06:15 | 35,6 | 50,5 |
| 25 | 06:30 | 37,7 | 51,3 |
| 26 | 06:45 | 38,9 | 50,6 |
| 27 | 07:00 | 44,1 | 52,2 |
| 28 | 07:15 | 45,5 | 55,5 |
| 29 | 07:30 | 45,2 | 56,2 |
| 30 | 07:45 | 44,1 | 54,4 |
| 31 | 08:00 | 43,1 | 57,2 |
| 32 | 08:15 | 50,5 | 61,1 |
| 33 | 08:30 | 48,8 | 64,2 |
| 34 | 08:45 | 52,9 | 64,5 |
| 35 | 09:00 | 51,9 | 67,2 |
| 36 | 09:15 | 52,3 | 65,3 |
| 37 | 09:30 | 52,4 | 67,6 |
| 38 | 09:45 | 52,0 | 66,3 |
| 39 | 10:00 | 51,6 | 67,1 |
| 40 | 10:15 | 51,9 | 68,5 |
| 41 | 10:30 | 50,7 | 67,6 |
| 42 | 10:45 | 52,2 | 70,8 |
| 43 | 11:00 | 52,6 | 66,7 |
| 44 | 11:15 | 52,1 | 64,2 |
| 45 | 11:30 | 51,6 | 63,7 |
| 46 | 11:45 | 52,4 | 65,2 |
| 47 | 12:00 | 52,0 | 64,0 |
| 48 | 12:15 | 49,3 | 65,2 |
| 49 | 12:30 | 52,1 | 65,5 |
| 50 | 12:45 | 50,7 | 66,9 |
| 51 | 13:00 | 52,3 | 69,2 |
| 52 | 13:15 | 51,4 | 69,1 |
| 53 | 13:30 | 51,7 | 67,6 |
| 54 | 13:45 | 52,9 | 63,1 |
| 55 | 14:00 | 51,2 | 68,8 |
| 56 | 14:15 | 51,5 | 66,6 |
| 57 | 14:30 | 52,8 | 65,5 |
| 58 | 14:45 | 51,5 | 65,2 |
| 59 | 15:00 | 52,9 | 66,4 |
| 60 | 15:15 | 51,3 | 66,5 |
| 61 | 15:30 | 51,8 | 67,9 |
| 62 | 15:45 | 52,0 | 65,8 |
| 63 | 16:00 | 51,4 | 67,3 |
| 64 | 16:15 | 51,5 | 68,3 |
| 65 | 16:30 | 50,6 | 63,2 |
| 66 | 16:45 | 51,2 | 65,7 |
| 67 | 17:00 | 51,4 | 64,8 |
| 68 | 17:15 | 52,0 | 63,8 |
| 69 | 17:30 | 51,4 | 67,9 |
| 70 | 17:45 | 53,0 | 66,5 |
| 71 | 18:00 | 49,2 | 63,6 |
| 72 | 18:15 | 44,8 | 64,1 |
| 73 | 18:30 | 43,5 | 64,4 |
| 74 | 18:45 | 39,2 | 58,5 |
| 75 | 19:00 | 40,0 | 58,6 |
| 76 | 19:15 | 36,7 | 55,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 77 | 19:30 | 36,9 | 55,9 |
| 78 | 19:45 | 38,5 | 58,6 |
| 79 | 20:00 | 37,8 | 59,2 |
| 80 | 20:15 | 36,0 | 55,1 |
| 81 | 20:30 | 37,3 | 58,2 |
| 82 | 20:45 | 35,8 | 56,3 |
| 83 | 21:00 | 37,2 | 57,7 |
| 84 | 21:15 | 35,3 | 52,7 |
| 85 | 21:30 | 35,8 | 55,4 |
| 86 | 21:45 | 36,6 | 53,6 |
| 87 | 22:00 | 37,8 | 55,3 |
| 88 | 22:15 | 37,2 | 56,5 |
| 89 | 22:30 | 38,3 | 57,7 |
| 90 | 22:45 | 36,8 | 53,6 |
| 91 | 23:00 | 39,5 | 52,0 |
| 92 | 23:15 | 42,6 | 53,0 |
| 93 | 23:30 | 41,3 | 57,8 |
| 94 | 23:45 | 42,2 | 59,3 |
| 95 | 00:00 | 40,1 | 59,3 |
| 96 | 00:15 | 38,8 | 58,6 |

**1.GÜN**
**29-30.09.2022**
**56.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 43,1 | 51,3 |
| 2 | 00:45 | 43,2 | 51,6 |
| 3 | 01:00 | 42,0 | 51,3 |
| 4 | 01:15 | 41,9 | 49,9 |
| 5 | 01:30 | 43,2 | 51,8 |
| 6 | 01:45 | 41,9 | 49,6 |
| 7 | 02:00 | 41,9 | 51,3 |
| 8 | 02:15 | 43,2 | 50,8 |
| 9 | 02:30 | 44,7 | 51,6 |
| 10 | 02:45 | 42,5 | 50,8 |
| 11 | 03:00 | 42,2 | 51,8 |
| 12 | 03:15 | 45,2 | 52,1 |
| 13 | 03:30 | 42,3 | 53,0 |
| 14 | 03:45 | 43,2 | 51,6 |
| 15 | 04:00 | 42,3 | 51,9 |
| 16 | 04:15 | 41,1 | 53,3 |
| 17 | 04:30 | 44,1 | 55,3 |
| 18 | 04:45 | 44,9 | 53,7 |
| 19 | 05:00 | 44,1 | 53,7 |
| 20 | 05:15 | 43,8 | 53,7 |
| 21 | 05:30 | 41,4 | 51,4 |
| 22 | 05:45 | 41,0 | 51,5 |
| 23 | 06:00 | 41,6 | 50,0 |
| 24 | 06:15 | 40,5 | 48,7 |
| 25 | 06:30 | 43,1 | 52,0 |
| 26 | 06:45 | 41,0 | 50,9 |
| 27 | 07:00 | 40,3 | 51,8 |
| 28 | 07:15 | 45,0 | 52,7 |
| 29 | 07:30 | 46,1 | 51,9 |
| 30 | 07:45 | 49,6 | 55,3 |
| 31 | 08:00 | 49,3 | 55,4 |
| 32 | 08:15 | 50,7 | 56,5 |
| 33 | 08:30 | 52,1 | 55,5 |
| 34 | 08:45 | 52,5 | 57,9 |
| 35 | 09:00 | 53,3 | 60,9 |
| 36 | 09:15 | 53,4 | 61,8 |
| 37 | 09:30 | 54,7 | 60,0 |
| 38 | 09:45 | 53,8 | 61,4 |
| 39 | 10:00 | 52,3 | 60,1 |
| 40 | 10:15 | 54,0 | 61,0 |
| 41 | 10:30 | 55,5 | 62,6 |
| 42 | 10:45 | 53,0 | 63,7 |
| 43 | 11:00 | 53,5 | 59,7 |
| 44 | 11:15 | 55,0 | 60,7 |
| 45 | 11:30 | 54,2 | 58,9 |
| 46 | 11:45 | 52,6 | 61,3 |
| 47 | 12:00 | 54,8 | 61,2 |
| 48 | 12:15 | 53,4 | 60,5 |
| 49 | 12:30 | 54,0 | 61,5 |
| 50 | 12:45 | 55,7 | 60,4 |
| 51 | 13:00 | 51,5 | 64,3 |
| 52 | 13:15 | 54,4 | 61,8 |
| 53 | 13:30 | 53,0 | 63,5 |
| 54 | 13:45 | 53,7 | 62,4 |
| 55 | 14:00 | 51,9 | 63,8 |
| 56 | 14:15 | 54,1 | 61,7 |
| 57 | 14:30 | 52,4 | 62,8 |
| 58 | 14:45 | 53,7 | 63,4 |
| 59 | 15:00 | 54,2 | 63,1 |
| 60 | 15:15 | 54,6 | 63,2 |
| 61 | 15:30 | 53,8 | 63,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 62 | 15:45 | 54,4 | 62,9 |
| 63 | 16:00 | 51,7 | 64,3 |
| 64 | 16:15 | 53,6 | 63,2 |
| 65 | 16:30 | 55,3 | 61,6 |
| 66 | 16:45 | 52,6 | 64,8 |
| 67 | 17:00 | 54,0 | 61,8 |
| 68 | 17:15 | 53,0 | 62,9 |
| 69 | 17:30 | 53,8 | 67,1 |
| 70 | 17:45 | 54,5 | 68,5 |
| 71 | 18:00 | 47,3 | 62,3 |
| 72 | 18:15 | 47,4 | 57,9 |
| 73 | 18:30 | 45,2 | 57,2 |
| 74 | 18:45 | 45,8 | 54,8 |
| 75 | 19:00 | 44,7 | 55,1 |
| 76 | 19:15 | 44,3 | 54,5 |
| 77 | 19:30 | 46,4 | 56,2 |
| 78 | 19:45 | 43,4 | 54,5 |
| 79 | 20:00 | 43,6 | 54,0 |
| 80 | 20:15 | 42,6 | 51,0 |
| 81 | 20:30 | 42,3 | 54,1 |
| 82 | 20:45 | 39,8 | 48,8 |
| 83 | 21:00 | 44,1 | 51,8 |
| 84 | 21:15 | 40,3 | 50,4 |
| 85 | 21:30 | 42,0 | 50,5 |
| 86 | 21:45 | 40,1 | 47,5 |
| 87 | 22:00 | 41,9 | 50,7 |
| 88 | 22:15 | 40,4 | 48,0 |
| 89 | 22:30 | 40,7 | 47,3 |
| 90 | 22:45 | 43,9 | 47,4 |
| 91 | 23:00 | 44,7 | 51,4 |
| 92 | 23:15 | 45,8 | 54,1 |
| 93 | 23:30 | 41,7 | 52,6 |
| 94 | 23:45 | 43,9 | 52,6 |
| 95 | 00:00 | 42,1 | 49,9 |
| 96 | 00:15 | 39,6 | 50,6 |

**1.GÜN**
**29-30.09.2022**
**57.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,5 | 45,2 |
| 2 | 00:45 | 40,3 | 47,5 |
| 3 | 01:00 | 40,2 | 48,2 |
| 4 | 01:15 | 40,0 | 47,0 |
| 5 | 01:30 | 39,2 | 47,0 |
| 6 | 01:45 | 39,0 | 46,6 |
| 7 | 02:00 | 38,3 | 45,4 |
| 8 | 02:15 | 40,7 | 48,9 |
| 9 | 02:30 | 38,5 | 45,6 |
| 10 | 02:45 | 36,7 | 43,5 |
| 11 | 03:00 | 38,3 | 45,3 |
| 12 | 03:15 | 39,8 | 46,5 |
| 13 | 03:30 | 38,7 | 46,0 |
| 14 | 03:45 | 36,8 | 44,4 |
| 15 | 04:00 | 38,9 | 45,9 |
| 16 | 04:15 | 37,4 | 44,2 |
| 17 | 04:30 | 38,0 | 45,1 |
| 18 | 04:45 | 36,9 | 43,8 |
| 19 | 05:00 | 39,3 | 46,4 |
| 20 | 05:15 | 36,2 | 42,7 |
| 21 | 05:30 | 38,8 | 45,0 |
| 22 | 05:45 | 37,2 | 44,9 |
| 23 | 06:00 | 35,4 | 42,4 |
| 24 | 06:15 | 36,7 | 43,7 |
| 25 | 06:30 | 39,4 | 46,1 |
| 26 | 06:45 | 37,8 | 45,1 |
| 27 | 07:00 | 41,3 | 50,0 |
| 28 | 07:15 | 41,9 | 50,6 |
| 29 | 07:30 | 42,9 | 51,6 |
| 30 | 07:45 | 45,5 | 52,5 |
| 31 | 08:00 | 46,0 | 52,1 |
| 32 | 08:15 | 47,4 | 52,4 |
| 33 | 08:30 | 45,5 | 51,2 |
| 34 | 08:45 | 49,9 | 56,5 |
| 35 | 09:00 | 50,4 | 55,9 |
| 36 | 09:15 | 51,1 | 58,1 |
| 37 | 09:30 | 52,6 | 60,3 |
| 38 | 09:45 | 50,4 | 57,6 |
| 39 | 10:00 | 51,2 | 56,6 |
| 40 | 10:15 | 51,6 | 57,9 |
| 41 | 10:30 | 52,3 | 58,4 |
| 42 | 10:45 | 47,9 | 56,0 |
| 43 | 11:00 | 47,0 | 54,4 |
| 44 | 11:15 | 48,4 | 55,6 |
| 45 | 11:30 | 48,2 | 56,2 |
| 46 | 11:45 | 50,8 | 58,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 47 | 12:00 | 46,8 | 54,4 |
| 48 | 12:15 | 49,6 | 56,8 |
| 49 | 12:30 | 47,4 | 54,6 |
| 50 | 12:45 | 48,3 | 55,1 |
| 51 | 13:00 | 50,7 | 58,4 |
| 52 | 13:15 | 50,7 | 57,2 |
| 53 | 13:30 | 51,8 | 59,5 |
| 54 | 13:45 | 51,0 | 58,4 |
| 55 | 14:00 | 50,8 | 58,7 |
| 56 | 14:15 | 51,4 | 58,3 |
| 57 | 14:30 | 50,3 | 57,2 |
| 58 | 14:45 | 52,1 | 60,7 |
| 59 | 15:00 | 50,9 | 58,3 |
| 60 | 15:15 | 50,8 | 58,5 |
| 61 | 15:30 | 53,3 | 62,1 |
| 62 | 15:45 | 51,7 | 58,7 |
| 63 | 16:00 | 50,9 | 58,5 |
| 64 | 16:15 | 53,4 | 61,6 |
| 65 | 16:30 | 51,3 | 59,4 |
| 66 | 16:45 | 50,8 | 57,4 |
| 67 | 17:00 | 53,1 | 61,1 |
| 68 | 17:15 | 50,5 | 57,4 |
| 69 | 17:30 | 50,9 | 59,0 |
| 70 | 17:45 | 52,6 | 61,1 |
| 71 | 18:00 | 51,7 | 62,7 |
| 72 | 18:15 | 49,7 | 60,3 |
| 73 | 18:30 | 45,4 | 55,3 |
| 74 | 18:45 | 44,1 | 54,3 |
| 75 | 19:00 | 45,0 | 54,7 |
| 76 | 19:15 | 42,8 | 52,8 |
| 77 | 19:30 | 44,3 | 55,1 |
| 78 | 19:45 | 43,6 | 53,4 |
| 79 | 20:00 | 43,6 | 52,1 |
| 80 | 20:15 | 43,2 | 51,7 |
| 81 | 20:30 | 41,9 | 50,3 |
| 82 | 20:45 | 38,0 | 45,4 |
| 83 | 21:00 | 38,3 | 46,7 |
| 84 | 21:15 | 38,5 | 46,2 |
| 85 | 21:30 | 40,5 | 48,2 |
| 86 | 21:45 | 40,5 | 48,5 |
| 87 | 22:00 | 40,1 | 47,1 |
| 88 | 22:15 | 41,0 | 47,0 |
| 89 | 22:30 | 38,4 | 45,5 |
| 90 | 22:45 | 41,9 | 48,3 |
| 91 | 23:00 | 41,5 | 50,2 |
| 92 | 23:15 | 42,4 | 51,1 |
| 93 | 23:30 | 43,2 | 51,4 |
| 94 | 23:45 | 40,7 | 46,7 |
| 95 | 00:00 | 41,6 | 47,8 |
| 96 | 00:15 | 41,0 | 47,6 |

**1.GÜN**
**29-30.09.2022**
**58.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,1 | 55,9 |
| 2 | 00:45 | 42,2 | 54,4 |
| 3 | 01:00 | 43,0 | 57,0 |
| 4 | 01:15 | 42,2 | 59,1 |
| 5 | 01:30 | 42,6 | 55,6 |
| 6 | 01:45 | 42,3 | 54,3 |
| 7 | 02:00 | 41,9 | 51,7 |
| 8 | 02:15 | 41,3 | 58,5 |
| 9 | 02:30 | 40,7 | 54,5 |
| 10 | 02:45 | 42,1 | 56,9 |
| 11 | 03:00 | 42,2 | 51,6 |
| 12 | 03:15 | 42,3 | 54,6 |
| 13 | 03:30 | 42,7 | 57,8 |
| 14 | 03:45 | 42,3 | 59,6 |
| 15 | 04:00 | 42,5 | 55,6 |
| 16 | 04:15 | 42,7 | 57,7 |
| 17 | 04:30 | 42,2 | 59,2 |
| 18 | 04:45 | 43,5 | 57,0 |
| 19 | 05:00 | 42,5 | 51,8 |
| 20 | 05:15 | 42,0 | 51,6 |
| 21 | 05:30 | 41,7 | 49,5 |
| 22 | 05:45 | 39,9 | 49,1 |
| 23 | 06:00 | 39,5 | 51,7 |
| 24 | 06:15 | 38,8 | 48,3 |
| 25 | 06:30 | 40,8 | 49,1 |
| 26 | 06:45 | 40,6 | 46,3 |
| 27 | 07:00 | 40,7 | 53,9 |
| 28 | 07:15 | 40,1 | 50,4 |
| 29 | 07:30 | 43,4 | 52,1 |
| 30 | 07:45 | 46,8 | 52,7 |
| 31 | 08:00 | 47,5 | 49,9 |
| 32 | 08:15 | 46,2 | 52,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 33 | 08:30 | 46,5 | 49,8 |
| 34 | 08:45 | 46,9 | 51,8 |
| 35 | 09:00 | 47,3 | 53,0 |
| 36 | 09:15 | 47,5 | 54,9 |
| 37 | 09:30 | 47,9 | 56,1 |
| 38 | 09:45 | 48,3 | 53,0 |
| 39 | 10:00 | 49,4 | 55,5 |
| 40 | 10:15 | 49,2 | 52,0 |
| 41 | 10:30 | 49,8 | 55,2 |
| 42 | 10:45 | 50,5 | 52,8 |
| 43 | 11:00 | 50,1 | 55,1 |
| 44 | 11:15 | 49,7 | 55,6 |
| 45 | 11:30 | 49,2 | 57,2 |
| 46 | 11:45 | 50,5 | 54,2 |
| 47 | 12:00 | 50,1 | 52,1 |
| 48 | 12:15 | 50,9 | 54,3 |
| 49 | 12:30 | 51,1 | 55,6 |
| 50 | 12:45 | 51,3 | 56,1 |
| 51 | 13:00 | 50,7 | 58,0 |
| 52 | 13:15 | 50,0 | 55,1 |
| 53 | 13:30 | 49,8 | 53,5 |
| 54 | 13:45 | 49,3 | 55,8 |
| 55 | 14:00 | 49,5 | 52,7 |
| 56 | 14:15 | 48,8 | 55,2 |
| 57 | 14:30 | 47,6 | 52,1 |
| 58 | 14:45 | 47,9 | 53,5 |
| 59 | 15:00 | 48,3 | 55,6 |
| 60 | 15:15 | 48,3 | 55,1 |
| 61 | 15:30 | 48,5 | 52,3 |
| 62 | 15:45 | 48,2 | 51,2 |
| 63 | 16:00 | 48,6 | 55,1 |
| 64 | 16:15 | 48,3 | 52,8 |
| 65 | 16:30 | 48,3 | 54,2 |
| 66 | 16:45 | 48,7 | 53,2 |
| 67 | 17:00 | 49,3 | 54,2 |
| 68 | 17:15 | 49,0 | 51,7 |
| 69 | 17:30 | 47,9 | 54,3 |
| 70 | 17:45 | 48,2 | 55,5 |
| 71 | 18:00 | 48,5 | 56,4 |
| 72 | 18:15 | 48,3 | 55,9 |
| 73 | 18:30 | 48,5 | 60,5 |
| 74 | 18:45 | 49,4 | 59,9 |
| 75 | 19:00 | 49,0 | 58,1 |
| 76 | 19:15 | 48,7 | 53,3 |
| 77 | 19:30 | 49,1 | 59,1 |
| 78 | 19:45 | 49,0 | 60,5 |
| 79 | 20:00 | 50,1 | 55,5 |
| 80 | 20:15 | 43,5 | 56,9 |
| 81 | 20:30 | 43,2 | 58,5 |
| 82 | 20:45 | 44,2 | 55,1 |
| 83 | 21:00 | 43,4 | 49,4 |
| 84 | 21:15 | 43,9 | 51,5 |
| 85 | 21:30 | 42,0 | 53,2 |
| 86 | 21:45 | 43,0 | 52,8 |
| 87 | 22:00 | 42,0 | 51,4 |
| 88 | 22:15 | 44,5 | 51,9 |
| 89 | 22:30 | 42,2 | 53,5 |
| 90 | 22:45 | 41,2 | 56,6 |
| 91 | 23:00 | 41,9 | 54,5 |
| 92 | 23:15 | 41,7 | 52,6 |
| 93 | 23:30 | 39,2 | 55,4 |
| 94 | 23:45 | 43,2 | 52,6 |
| 95 | 00:00 | 42,5 | 55,7 |
| 96 | 00:15 | 44,5 | 53,0 |

**1.GÜN**
**29-30.09.2022**
**59.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,1 | 62,5 |
| 2 | 00:45 | 39,6 | 58,1 |
| 3 | 01:00 | 38,7 | 59,6 |
| 4 | 01:15 | 40,1 | 59,9 |
| 5 | 01:30 | 39,9 | 58,5 |
| 6 | 01:45 | 40,0 | 59,2 |
| 7 | 02:00 | 40,4 | 61,1 |
| 8 | 02:15 | 40,2 | 58,6 |
| 9 | 02:30 | 37,3 | 57,7 |
| 10 | 02:45 | 38,5 | 58,0 |
| 11 | 03:00 | 40,1 | 59,6 |
| 12 | 03:15 | 39,0 | 61,2 |
| 13 | 03:30 | 39,4 | 59,9 |
| 14 | 03:45 | 38,3 | 60,0 |
| 15 | 04:00 | 38,5 | 61,5 |
| 16 | 04:15 | 39,0 | 60,6 |
| 17 | 04:30 | 35,3 | 53,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 18 | 04:45 | 37,2 | 58,3 |
| 19 | 05:00 | 38,1 | 57,2 |
| 20 | 05:15 | 37,6 | 56,7 |
| 21 | 05:30 | 37,8 | 59,2 |
| 22 | 05:45 | 38,3 | 55,8 |
| 23 | 06:00 | 35,6 | 55,2 |
| 24 | 06:15 | 35,8 | 53,2 |
| 25 | 06:30 | 38,6 | 54,6 |
| 26 | 06:45 | 39,6 | 53,8 |
| 27 | 07:00 | 45,0 | 55,6 |
| 28 | 07:15 | 46,4 | 54,6 |
| 29 | 07:30 | 46,3 | 53,6 |
| 30 | 07:45 | 47,0 | 57,8 |
| 31 | 08:00 | 46,5 | 64,3 |
| 32 | 08:15 | 48,9 | 69,0 |
| 33 | 08:30 | 49,3 | 70,3 |
| 34 | 08:45 | 54,2 | 68,9 |
| 35 | 09:00 | 54,6 | 69,9 |
| 36 | 09:15 | 54,8 | 67,7 |
| 37 | 09:30 | 55,0 | 70,3 |
| 38 | 09:45 | 54,6 | 68,9 |
| 39 | 10:00 | 52,2 | 67,9 |
| 40 | 10:15 | 53,1 | 70,2 |
| 41 | 10:30 | 52,2 | 69,3 |
| 42 | 10:45 | 54,2 | 72,6 |
| 43 | 11:00 | 51,7 | 68,3 |
| 44 | 11:15 | 51,2 | 65,8 |
| 45 | 11:30 | 52,3 | 67,2 |
| 46 | 11:45 | 53,2 | 68,9 |
| 47 | 12:00 | 50,7 | 65,1 |
| 48 | 12:15 | 49,7 | 68,9 |
| 49 | 12:30 | 50,7 | 66,4 |
| 50 | 12:45 | 55,6 | 70,7 |
| 51 | 13:00 | 57,1 | 69,7 |
| 52 | 13:15 | 58,5 | 73,7 |
| 53 | 13:30 | 55,3 | 71,4 |
| 54 | 13:45 | 55,7 | 69,5 |
| 55 | 14:00 | 54,8 | 72,8 |
| 56 | 14:15 | 55,2 | 70,3 |
| 57 | 14:30 | 55,6 | 72,1 |
| 58 | 14:45 | 54,8 | 72,4 |
| 59 | 15:00 | 57,5 | 70,2 |
| 60 | 15:15 | 56,6 | 72,3 |
| 61 | 15:30 | 57,5 | 71,8 |
| 62 | 15:45 | 55,6 | 71,6 |
| 63 | 16:00 | 57,1 | 71,1 |
| 64 | 16:15 | 54,6 | 71,4 |
| 65 | 16:30 | 53,4 | 69,7 |
| 66 | 16:45 | 54,1 | 69,4 |
| 67 | 17:00 | 54,2 | 71,3 |
| 68 | 17:15 | 54,7 | 70,2 |
| 69 | 17:30 | 55,1 | 72,6 |
| 70 | 17:45 | 54,3 | 70,8 |
| 71 | 18:00 | 53,9 | 72,4 |
| 72 | 18:15 | 48,9 | 73,1 |
| 73 | 18:30 | 47,4 | 73,6 |
| 74 | 18:45 | 41,7 | 65,0 |
| 75 | 19:00 | 43,0 | 65,9 |
| 76 | 19:15 | 39,1 | 62,4 |
| 77 | 19:30 | 37,7 | 59,7 |
| 78 | 19:45 | 39,4 | 62,6 |
| 79 | 20:00 | 38,8 | 63,1 |
| 80 | 20:15 | 38,3 | 61,2 |
| 81 | 20:30 | 38,2 | 62,4 |
| 82 | 20:45 | 38,7 | 63,1 |
| 83 | 21:00 | 38,1 | 61,6 |
| 84 | 21:15 | 37,6 | 58,5 |
| 85 | 21:30 | 36,6 | 59,0 |
| 86 | 21:45 | 38,6 | 59,0 |
| 87 | 22:00 | 38,0 | 57,8 |
| 88 | 22:15 | 39,0 | 61,6 |
| 89 | 22:30 | 39,9 | 62,8 |
| 90 | 22:45 | 38,5 | 58,5 |
| 91 | 23:00 | 41,2 | 56,6 |
| 92 | 23:15 | 45,6 | 64,3 |
| 93 | 23:30 | 43,1 | 62,9 |
| 94 | 23:45 | 42,4 | 62,1 |
| 95 | 00:00 | 42,0 | 64,6 |
| 96 | 00:15 | 40,5 | 63,8 |

**1.GÜN**
**29-30.09.2022**
**60.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,3 | 53,8 |
| 2 | 00:45 | 37,9 | 55,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | 01:00 | 39,3 | 55,7 | 47 | 12:00 | 46,3 | 58,5 |
| 4 | 01:15 | 39,0 | 54,3 | 48 | 12:15 | 49,2 | 58,8 |
| 5 | 01:30 | 39,1 | 55,0 | 49 | 12:30 | 51,9 | 60,1 |
| 6 | 01:45 | 39,5 | 56,6 | 50 | 12:45 | 50,3 | 62,2 |
| 7 | 02:00 | 39,4 | 54,5 | 51 | 13:00 | 52,2 | 56,9 |
| 8 | 02:15 | 36,3 | 53,6 | 52 | 13:15 | 52,1 | 60,8 |
| 9 | 02:30 | 37,6 | 53,8 | 53 | 13:30 | 50,3 | 56,7 |
| 10 | 02:45 | 39,4 | 55,4 | 54 | 13:45 | 51,7 | 58,8 |
| 11 | 03:00 | 38,3 | 56,8 | 55 | 14:00 | 52,0 | 59,7 |
| 12 | 03:15 | 37,8 | 55,8 | 56 | 14:15 | 50,2 | 58,9 |
| 13 | 03:30 | 36,3 | 55,3 | 57 | 14:30 | 49,2 | 58,5 |
| 14 | 03:45 | 36,4 | 56,5 | 58 | 14:45 | 50,3 | 59,6 |
| 15 | 04:00 | 37,1 | 55,8 | 59 | 15:00 | 51,6 | 59,6 |
| 16 | 04:15 | 33,5 | 49,2 | 60 | 15:15 | 54,0 | 61,1 |
| 17 | 04:30 | 35,1 | 53,7 | 61 | 15:30 | 50,7 | 59,0 |
| 18 | 04:45 | 36,1 | 52,7 | 62 | 15:45 | 53,7 | 60,4 |
| 19 | 05:00 | 35,7 | 52,2 | 63 | 16:00 | 51,9 | 61,4 |
| 20 | 05:15 | 35,9 | 54,7 | 64 | 16:15 | 48,3 | 56,9 |
| 21 | 05:30 | 36,4 | 51,5 | 65 | 16:30 | 50,8 | 58,9 |
| 22 | 05:45 | 36,9 | 48,8 | 66 | 16:45 | 48,9 | 58,4 |
| 23 | 06:00 | 40,3 | 51,3 | 67 | 17:00 | 49,6 | 57,4 |
| 24 | 06:15 | 41,7 | 53,4 | 68 | 17:15 | 46,0 | 61,1 |
| 25 | 06:30 | 41,4 | 55,0 | 69 | 17:30 | 46,9 | 59,7 |
| 26 | 06:45 | 41,0 | 53,3 | 70 | 17:45 | 44,2 | 57,1 |
| 27 | 07:00 | 43,7 | 56,7 | 71 | 18:00 | 40,2 | 57,6 |
| 28 | 07:15 | 43,5 | 58,3 | 72 | 18:15 | 39,1 | 57,9 |
| 29 | 07:30 | 47,1 | 57,0 | 73 | 18:30 | 35,1 | 52,6 |
| 30 | 07:45 | 47,9 | 59,2 | 74 | 18:45 | 35,7 | 52,5 |
| 31 | 08:00 | 51,6 | 58,8 | 75 | 19:00 | 35,0 | 53,5 |
| 32 | 08:15 | 51,3 | 62,0 | 76 | 19:15 | 35,0 | 53,5 |
| 33 | 08:30 | 49,7 | 63,6 | 77 | 19:30 | 36,8 | 56,0 |
| 34 | 08:45 | 52,0 | 60,5 | 78 | 19:45 | 36,1 | 56,6 |
| 35 | 09:00 | 50,3 | 56,0 | 79 | 20:00 | 34,2 | 52,7 |
| 36 | 09:15 | 50,9 | 59,0 | 80 | 20:15 | 35,6 | 55,7 |
| 37 | 09:30 | 48,4 | 57,0 | 81 | 20:30 | 34,1 | 53,8 |
| 38 | 09:45 | 47,7 | 57,0 | 82 | 20:45 | 35,8 | 55,0 |
| 39 | 10:00 | 49,7 | 56,5 | 83 | 21:00 | 33,9 | 50,3 |
| 40 | 10:15 | 50,3 | 58,4 | 84 | 21:15 | 34,4 | 52,9 |
| 41 | 10:30 | 48,9 | 57,1 | 85 | 21:30 | 35,2 | 51,2 |
| 42 | 10:45 | 51,1 | 60,4 | 86 | 21:45 | 36,5 | 52,9 |
| 43 | 11:00 | 48,3 | 56,1 | 87 | 22:00 | 35,9 | 54,0 |
| 44 | 11:15 | 50,3 | 58,0 | 88 | 22:15 | 36,9 | 55,1 |
| 45 | 11:30 | 48,2 | 54,8 | 89 | 22:30 | 35,4 | 51,3 |
| 46 | 11:45 | 49,1 | 57,5 | 90 | 22:45 | 38,2 | 49,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 91 | 23:00 | 35,9 | 58,8 |
| 92 | 23:15 | 39,8 | 55,2 |
| 93 | 23:30 | 40,6 | 56,8 |
| 94 | 23:45 | 38,8 | 56,7 |
| 95 | 00:00 | 37,5 | 56,1 |
| 96 | 00:15 | 43,9 | 56,6 |

**1.GÜN**
**29-30.09.2022**
**61.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,9 | 56,2 |
| 2 | 00:45 | 43,2 | 59,5 |
| 3 | 01:00 | 44,8 | 60,7 |
| 4 | 01:15 | 42,0 | 60,2 |
| 5 | 01:30 | 46,7 | 61,1 |
| 6 | 01:45 | 44,4 | 59,0 |
| 7 | 02:00 | 42,5 | 61,7 |
| 8 | 02:15 | 46,2 | 58,1 |
| 9 | 02:30 | 42,5 | 61,7 |
| 10 | 02:45 | 41,9 | 54,5 |
| 11 | 03:00 | 43,0 | 58,3 |
| 12 | 03:15 | 45,0 | 63,0 |
| 13 | 03:30 | 43,5 | 55,4 |
| 14 | 03:45 | 42,8 | 56,5 |
| 15 | 04:00 | 43,6 | 58,2 |
| 16 | 04:15 | 42,8 | 58,0 |
| 17 | 04:30 | 43,5 | 59,4 |
| 18 | 04:45 | 40,4 | 58,0 |
| 19 | 05:00 | 44,1 | 58,5 |
| 20 | 05:15 | 42,6 | 60,6 |
| 21 | 05:30 | 44,6 | 59,1 |
| 22 | 05:45 | 44,0 | 57,1 |
| 23 | 06:00 | 42,5 | 54,9 |
| 24 | 06:15 | 43,1 | 59,4 |
| 25 | 06:30 | 45,3 | 58,7 |
| 26 | 06:45 | 43,7 | 61,1 |
| 27 | 07:00 | 44,3 | 60,1 |
| 28 | 07:15 | 45,6 | 66,1 |
| 29 | 07:30 | 47,3 | 61,8 |
| 30 | 07:45 | 50,0 | 64,8 |
| 31 | 08:00 | 51,2 | 63,5 |
| 32 | 08:15 | 51,5 | 65,2 |
| 33 | 08:30 | 51,4 | 66,8 |
| 34 | 08:45 | 53,1 | 67,6 |
| 35 | 09:00 | 55,0 | 65,4 |
| 36 | 09:15 | 54,5 | 66,5 |
| 37 | 09:30 | 55,1 | 65,7 |
| 38 | 09:45 | 53,4 | 65,2 |
| 39 | 10:00 | 50,1 | 61,2 |
| 40 | 10:15 | 52,1 | 65,0 |
| 41 | 10:30 | 54,5 | 64,2 |
| 42 | 10:45 | 50,7 | 62,8 |
| 43 | 11:00 | 51,1 | 63,6 |
| 44 | 11:15 | 52,0 | 63,7 |
| 45 | 11:30 | 52,9 | 64,6 |
| 46 | 11:45 | 54,6 | 60,5 |
| 47 | 12:00 | 52,2 | 61,9 |
| 48 | 12:15 | 54,5 | 60,4 |
| 49 | 12:30 | 53,2 | 61,5 |
| 50 | 12:45 | 54,1 | 60,1 |
| 51 | 13:00 | 52,1 | 61,2 |
| 52 | 13:15 | 52,4 | 60,4 |
| 53 | 13:30 | 54,6 | 61,7 |
| 54 | 13:45 | 51,6 | 61,3 |
| 55 | 14:00 | 51,0 | 61,0 |
| 56 | 14:15 | 53,3 | 61,3 |
| 57 | 14:30 | 52,7 | 63,4 |
| 58 | 14:45 | 50,5 | 60,7 |
| 59 | 15:00 | 49,0 | 59,8 |
| 60 | 15:15 | 52,9 | 60,1 |
| 61 | 15:30 | 52,1 | 60,7 |
| 62 | 15:45 | 49,4 | 62,4 |
| 63 | 16:00 | 50,8 | 61,7 |
| 64 | 16:15 | 53,8 | 60,9 |
| 65 | 16:30 | 49,8 | 58,4 |
| 66 | 16:45 | 47,0 | 57,9 |
| 67 | 17:00 | 46,8 | 59,7 |
| 68 | 17:15 | 49,5 | 62,7 |
| 69 | 17:30 | 50,7 | 64,5 |
| 70 | 17:45 | 54,2 | 63,5 |
| 71 | 18:00 | 49,8 | 61,0 |
| 72 | 18:15 | 52,1 | 62,8 |
| 73 | 18:30 | 50,2 | 61,7 |
| 74 | 18:45 | 49,9 | 60,6 |
| 75 | 19:00 | 51,0 | 63,4 |
| 76 | 19:15 | 48,7 | 65,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 77 | 19:30 | 50,4 | 63,3 |
| 78 | 19:45 | 50,9 | 63,0 |
| 79 | 20:00 | 49,0 | 61,2 |
| 80 | 20:15 | 49,3 | 62,8 |
| 81 | 20:30 | 47,0 | 58,4 |
| 82 | 20:45 | 47,7 | 59,9 |
| 83 | 21:00 | 50,6 | 60,2 |
| 84 | 21:15 | 49,3 | 60,3 |
| 85 | 21:30 | 49,2 | 60,3 |
| 86 | 21:45 | 49,1 | 57,9 |
| 87 | 22:00 | 46,0 | 56,3 |
| 88 | 22:15 | 47,7 | 57,4 |
| 89 | 22:30 | 44,7 | 57,2 |
| 90 | 22:45 | 46,4 | 57,3 |
| 91 | 23:00 | 45,0 | 57,2 |
| 92 | 23:15 | 44,4 | 54,0 |
| 93 | 23:30 | 41,1 | 54,4 |
| 94 | 23:45 | 41,8 | 55,4 |
| 95 | 00:00 | 40,7 | 55,2 |
| 96 | 00:15 | 46,4 | 56,8 |

**1.GÜN**
**29-30.09.2022**
**62.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,8 | 59,0 |
| 2 | 00:45 | 41,2 | 61,0 |
| 3 | 01:00 | 42,0 | 62,6 |
| 4 | 01:15 | 44,4 | 64,1 |
| 5 | 01:30 | 45,8 | 65,7 |
| 6 | 01:45 | 44,6 | 65,0 |
| 7 | 02:00 | 44,4 | 60,3 |
| 8 | 02:15 | 44,2 | 60,6 |
| 9 | 02:30 | 44,4 | 63,6 |
| 10 | 02:45 | 43,0 | 61,4 |
| 11 | 03:00 | 43,2 | 57,8 |
| 12 | 03:15 | 44,1 | 62,5 |
| 13 | 03:30 | 43,2 | 64,0 |
| 14 | 03:45 | 43,2 | 66,9 |
| 15 | 04:00 | 43,0 | 61,7 |
| 16 | 04:15 | 42,7 | 63,2 |
| 17 | 04:30 | 44,6 | 65,3 |
| 18 | 04:45 | 45,6 | 67,3 |
| 19 | 05:00 | 45,0 | 63,9 |
| 20 | 05:15 | 44,6 | 63,5 |
| 21 | 05:30 | 44,3 | 61,2 |
| 22 | 05:45 | 42,1 | 60,4 |
| 23 | 06:00 | 39,9 | 60,9 |
| 24 | 06:15 | 37,5 | 54,1 |
| 25 | 06:30 | 40,8 | 57,5 |
| 26 | 06:45 | 39,0 | 52,1 |
| 27 | 07:00 | 40,7 | 57,2 |
| 28 | 07:15 | 41,9 | 55,6 |
| 29 | 07:30 | 45,2 | 57,7 |
| 30 | 07:45 | 46,2 | 55,9 |
| 31 | 08:00 | 46,6 | 52,0 |
| 32 | 08:15 | 50,6 | 57,1 |
| 33 | 08:30 | 48,5 | 52,5 |
| 34 | 08:45 | 49,1 | 54,4 |
| 35 | 09:00 | 51,0 | 57,2 |
| 36 | 09:15 | 51,2 | 59,1 |
| 37 | 09:30 | 51,6 | 60,6 |
| 38 | 09:45 | 52,2 | 57,2 |
| 39 | 10:00 | 52,7 | 58,9 |
| 40 | 10:15 | 52,0 | 60,2 |
| 41 | 10:30 | 52,5 | 59,6 |
| 42 | 10:45 | 53,1 | 60,5 |
| 43 | 11:00 | 52,9 | 60,2 |
| 44 | 11:15 | 52,5 | 60,8 |
| 45 | 11:30 | 52,5 | 60,7 |
| 46 | 11:45 | 53,6 | 57,5 |
| 47 | 12:00 | 53,9 | 60,7 |
| 48 | 12:15 | 52,4 | 56,0 |
| 49 | 12:30 | 52,6 | 59,7 |
| 50 | 12:45 | 52,7 | 58,0 |
| 51 | 13:00 | 52,8 | 62,6 |
| 52 | 13:15 | 53,5 | 57,8 |
| 53 | 13:30 | 53,1 | 59,3 |
| 54 | 13:45 | 52,6 | 59,2 |
| 55 | 14:00 | 52,9 | 58,7 |
| 56 | 14:15 | 54,1 | 60,8 |
| 57 | 14:30 | 49,2 | 59,9 |
| 58 | 14:45 | 50,3 | 59,1 |
| 59 | 15:00 | 53,5 | 61,3 |
| 60 | 15:15 | 51,8 | 59,0 |
| 61 | 15:30 | 53,6 | 57,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 62 | 15:45 | 51,5 | 61,5 |
| 63 | 16:00 | 53,8 | 60,7 |
| 64 | 16:15 | 53,9 | 58,9 |
| 65 | 16:30 | 49,5 | 55,9 |
| 66 | 16:45 | 52,4 | 57,2 |
| 67 | 17:00 | 51,0 | 55,8 |
| 68 | 17:15 | 50,6 | 58,5 |
| 69 | 17:30 | 52,9 | 60,0 |
| 70 | 17:45 | 53,1 | 61,2 |
| 71 | 18:00 | 50,1 | 58,4 |
| 72 | 18:15 | 49,9 | 57,9 |
| 73 | 18:30 | 50,3 | 61,1 |
| 74 | 18:45 | 52,7 | 62,4 |
| 75 | 19:00 | 51,7 | 61,0 |
| 76 | 19:15 | 48,3 | 55,4 |
| 77 | 19:30 | 52,4 | 62,7 |
| 78 | 19:45 | 54,3 | 66,8 |
| 79 | 20:00 | 53,5 | 62,8 |
| 80 | 20:15 | 46,3 | 60,5 |
| 81 | 20:30 | 45,0 | 64,7 |
| 82 | 20:45 | 40,7 | 57,8 |
| 83 | 21:00 | 42,0 | 54,8 |
| 84 | 21:15 | 39,8 | 53,0 |
| 85 | 21:30 | 42,0 | 57,2 |
| 86 | 21:45 | 39,2 | 53,8 |
| 87 | 22:00 | 41,3 | 55,0 |
| 88 | 22:15 | 41,1 | 55,0 |
| 89 | 22:30 | 41,2 | 57,0 |
| 90 | 22:45 | 41,5 | 53,6 |
| 91 | 23:00 | 41,0 | 53,3 |
| 92 | 23:15 | 42,2 | 56,6 |
| 93 | 23:30 | 38,3 | 54,7 |
| 94 | 23:45 | 39,0 | 56,5 |
| 95 | 00:00 | 38,7 | 56,0 |
| 96 | 00:15 | 40,9 | 53,5 |

**1.GÜN**
**29-30.09.2022**
**63.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,1 | 53,5 |
| 2 | 00:45 | 40,7 | 52,4 |
| 3 | 01:00 | 40,6 | 54,0 |
| 4 | 01:15 | 39,9 | 55,8 |
| 5 | 01:30 | 41,2 | 53,7 |
| 6 | 01:45 | 40,0 | 51,2 |
| 7 | 02:00 | 39,9 | 49,2 |
| 8 | 02:15 | 39,8 | 56,4 |
| 9 | 02:30 | 40,8 | 54,5 |
| 10 | 02:45 | 40,6 | 54,9 |
| 11 | 03:00 | 40,7 | 49,6 |
| 12 | 03:15 | 42,1 | 54,2 |
| 13 | 03:30 | 41,3 | 55,5 |
| 14 | 03:45 | 41,2 | 58,2 |
| 15 | 04:00 | 41,1 | 53,7 |
| 16 | 04:15 | 40,9 | 54,8 |
| 17 | 04:30 | 42,6 | 59,7 |
| 18 | 04:45 | 43,7 | 57,6 |
| 19 | 05:00 | 43,0 | 52,4 |
| 20 | 05:15 | 42,4 | 51,9 |
| 21 | 05:30 | 42,1 | 50,0 |
| 22 | 05:45 | 40,1 | 49,3 |
| 23 | 06:00 | 39,9 | 52,3 |
| 24 | 06:15 | 39,1 | 48,7 |
| 25 | 06:30 | 41,1 | 49,6 |
| 26 | 06:45 | 41,1 | 46,9 |
| 27 | 07:00 | 41,2 | 54,5 |
| 28 | 07:15 | 40,6 | 51,0 |
| 29 | 07:30 | 43,9 | 52,8 |
| 30 | 07:45 | 47,4 | 53,4 |
| 31 | 08:00 | 48,1 | 50,5 |
| 32 | 08:15 | 46,8 | 52,8 |
| 33 | 08:30 | 47,1 | 50,4 |
| 34 | 08:45 | 47,5 | 52,5 |
| 35 | 09:00 | 47,9 | 53,7 |
| 36 | 09:15 | 48,1 | 55,6 |
| 37 | 09:30 | 48,5 | 56,8 |
| 38 | 09:45 | 48,9 | 53,7 |
| 39 | 10:00 | 50,0 | 56,2 |
| 40 | 10:15 | 49,8 | 52,7 |
| 41 | 10:30 | 50,4 | 55,9 |
| 42 | 10:45 | 51,1 | 53,5 |
| 43 | 11:00 | 50,7 | 55,8 |
| 44 | 11:15 | 50,3 | 56,3 |
| 45 | 11:30 | 49,8 | 57,9 |
| 46 | 11:45 | 51,1 | 54,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 47 | 12:00 | 50,7 | 52,8 |
| 48 | 12:15 | 51,5 | 54,9 |
| 49 | 12:30 | 51,7 | 56,3 |
| 50 | 12:45 | 51,9 | 56,8 |
| 51 | 13:00 | 51,3 | 58,7 |
| 52 | 13:15 | 50,6 | 55,8 |
| 53 | 13:30 | 50,4 | 54,2 |
| 54 | 13:45 | 49,9 | 56,5 |
| 55 | 14:00 | 50,1 | 53,4 |
| 56 | 14:15 | 49,4 | 55,9 |
| 57 | 14:30 | 48,2 | 52,8 |
| 58 | 14:45 | 48,5 | 54,2 |
| 59 | 15:00 | 48,9 | 56,3 |
| 60 | 15:15 | 48,9 | 55,8 |
| 61 | 15:30 | 49,1 | 53,0 |
| 62 | 15:45 | 48,8 | 51,8 |
| 63 | 16:00 | 49,2 | 55,8 |
| 64 | 16:15 | 48,9 | 53,5 |
| 65 | 16:30 | 48,9 | 54,8 |
| 66 | 16:45 | 49,3 | 53,9 |
| 67 | 17:00 | 49,9 | 54,8 |
| 68 | 17:15 | 49,6 | 52,3 |
| 69 | 17:30 | 48,5 | 54,9 |
| 70 | 17:45 | 48,8 | 56,2 |
| 71 | 18:00 | 49,1 | 57,1 |
| 72 | 18:15 | 48,9 | 56,6 |
| 73 | 18:30 | 49,1 | 61,2 |
| 74 | 18:45 | 50,0 | 60,6 |
| 75 | 19:00 | 49,6 | 58,8 |
| 76 | 19:15 | 49,3 | 54,0 |
| 77 | 19:30 | 49,7 | 59,9 |
| 78 | 19:45 | 49,6 | 61,2 |
| 79 | 20:00 | 46,6 | 55,7 |
| 80 | 20:15 | 41,9 | 54,9 |
| 81 | 20:30 | 43,3 | 58,7 |
| 82 | 20:45 | 42,2 | 52,6 |
| 83 | 21:00 | 43,5 | 49,6 |
| 84 | 21:15 | 42,3 | 49,5 |
| 85 | 21:30 | 42,2 | 53,5 |
| 86 | 21:45 | 41,1 | 50,4 |
| 87 | 22:00 | 42,2 | 51,5 |
| 88 | 22:15 | 42,9 | 50,1 |
| 89 | 22:30 | 40,7 | 51,7 |
| 90 | 22:45 | 39,7 | 54,6 |
| 91 | 23:00 | 40,3 | 52,5 |
| 92 | 23:15 | 41,9 | 52,8 |
| 93 | 23:30 | 37,9 | 53,4 |
| 94 | 23:45 | 43,3 | 52,8 |
| 95 | 00:00 | 41,1 | 53,8 |
| 96 | 00:15 | 39,1 | 51,1 |

**1.GÜN**
**29-30.09.2022**
**64.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,6 | 68,4 |
| 2 | 00:45 | 41,7 | 63,4 |
| 3 | 01:00 | 42,4 | 65,3 |
| 4 | 01:15 | 43,9 | 65,5 |
| 5 | 01:30 | 43,6 | 63,8 |
| 6 | 01:45 | 43,7 | 64,8 |
| 7 | 02:00 | 44,1 | 66,8 |
| 8 | 02:15 | 44,0 | 64,1 |
| 9 | 02:30 | 40,9 | 62,9 |
| 10 | 02:45 | 42,1 | 63,3 |
| 11 | 03:00 | 43,9 | 65,2 |
| 12 | 03:15 | 42,7 | 66,9 |
| 13 | 03:30 | 43,1 | 65,5 |
| 14 | 03:45 | 42,4 | 66,3 |
| 15 | 04:00 | 42,5 | 67,9 |
| 16 | 04:15 | 43,1 | 66,9 |
| 17 | 04:30 | 39,2 | 58,9 |
| 18 | 04:45 | 41,1 | 64,4 |
| 19 | 05:00 | 42,0 | 63,2 |
| 20 | 05:15 | 41,5 | 62,6 |
| 21 | 05:30 | 41,7 | 65,5 |
| 22 | 05:45 | 42,4 | 61,7 |
| 23 | 06:00 | 39,5 | 61,1 |
| 24 | 06:15 | 39,7 | 58,7 |
| 25 | 06:30 | 42,1 | 59,7 |
| 26 | 06:45 | 43,4 | 58,8 |
| 27 | 07:00 | 49,2 | 60,8 |
| 28 | 07:15 | 50,7 | 59,7 |
| 29 | 07:30 | 50,5 | 58,6 |
| 30 | 07:45 | 51,5 | 63,2 |
| 31 | 08:00 | 50,8 | 70,3 |
| 32 | 08:15 | 51,0 | 71,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 33 | 08:30 | 51,3 | 73,0 |
| 34 | 08:45 | 56,3 | 71,5 |
| 35 | 09:00 | 56,8 | 72,5 |
| 36 | 09:15 | 57,2 | 70,4 |
| 37 | 09:30 | 57,3 | 73,0 |
| 38 | 09:45 | 56,9 | 71,5 |
| 39 | 10:00 | 54,2 | 70,7 |
| 40 | 10:15 | 55,2 | 72,9 |
| 41 | 10:30 | 54,2 | 71,9 |
| 42 | 10:45 | 56,3 | 75,4 |
| 43 | 11:00 | 53,7 | 70,9 |
| 44 | 11:15 | 53,2 | 68,3 |
| 45 | 11:30 | 54,3 | 69,9 |
| 46 | 11:45 | 55,3 | 71,5 |
| 47 | 12:00 | 52,6 | 67,7 |
| 48 | 12:15 | 51,6 | 71,5 |
| 49 | 12:30 | 52,7 | 69,0 |
| 50 | 12:45 | 57,9 | 73,4 |
| 51 | 13:00 | 59,3 | 72,3 |
| 52 | 13:15 | 60,7 | 76,6 |
| 53 | 13:30 | 59,9 | 77,3 |
| 54 | 13:45 | 60,3 | 75,1 |
| 55 | 14:00 | 59,4 | 78,8 |
| 56 | 14:15 | 59,8 | 76,1 |
| 57 | 14:30 | 60,2 | 78,0 |
| 58 | 14:45 | 59,4 | 78,4 |
| 59 | 15:00 | 62,1 | 75,9 |
| 60 | 15:15 | 61,2 | 78,3 |
| 61 | 15:30 | 62,1 | 77,8 |
| 62 | 15:45 | 60,2 | 77,5 |
| 63 | 16:00 | 61,7 | 76,9 |
| 64 | 16:15 | 59,2 | 77,3 |
| 65 | 16:30 | 57,8 | 75,3 |
| 66 | 16:45 | 58,6 | 75,0 |
| 67 | 17:00 | 58,7 | 77,1 |
| 68 | 17:15 | 59,3 | 76,0 |
| 69 | 17:30 | 60,3 | 79,3 |
| 70 | 17:45 | 59,3 | 77,5 |
| 71 | 18:00 | 58,9 | 79,1 |
| 72 | 18:15 | 53,5 | 79,8 |
| 73 | 18:30 | 52,0 | 80,3 |
| 74 | 18:45 | 45,6 | 71,0 |
| 75 | 19:00 | 47,1 | 71,9 |
| 76 | 19:15 | 42,7 | 68,0 |
| 77 | 19:30 | 41,2 | 65,4 |
| 78 | 19:45 | 43,1 | 68,4 |
| 79 | 20:00 | 42,4 | 69,0 |
| 80 | 20:15 | 41,9 | 66,9 |
| 81 | 20:30 | 41,7 | 68,0 |
| 82 | 20:45 | 42,2 | 69,0 |
| 83 | 21:00 | 41,6 | 67,3 |
| 84 | 21:15 | 41,1 | 63,9 |
| 85 | 21:30 | 40,1 | 64,7 |
| 86 | 21:45 | 43,0 | 65,8 |
| 87 | 22:00 | 42,4 | 64,5 |
| 88 | 22:15 | 43,4 | 68,7 |
| 89 | 22:30 | 44,6 | 70,0 |
| 90 | 22:45 | 42,9 | 65,3 |
| 91 | 23:00 | 46,1 | 63,1 |
| 92 | 23:15 | 51,0 | 71,7 |
| 93 | 23:30 | 48,2 | 70,2 |
| 94 | 23:45 | 47,2 | 69,2 |
| 95 | 00:00 | 46,8 | 72,0 |
| 96 | 00:15 | 45,2 | 69,2 |

**1.GÜN**
**29-30.09.2022**
**65.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,0 | 49,5 |
| 2 | 00:45 | 42,6 | 50,1 |
| 3 | 01:00 | 43,3 | 51,9 |
| 4 | 01:15 | 41,9 | 49,8 |
| 5 | 01:30 | 44,3 | 52,1 |
| 6 | 01:45 | 42,0 | 50,9 |
| 7 | 02:00 | 42,4 | 51,9 |
| 8 | 02:15 | 43,8 | 52,9 |
| 9 | 02:30 | 42,5 | 50,2 |
| 10 | 02:45 | 42,1 | 50,3 |
| 11 | 03:00 | 43,2 | 49,5 |
| 12 | 03:15 | 44,2 | 52,7 |
| 13 | 03:30 | 42,9 | 51,0 |
| 14 | 03:45 | 41,8 | 49,1 |
| 15 | 04:00 | 43,0 | 51,0 |
| 16 | 04:15 | 44,3 | 48,9 |
| 17 | 04:30 | 41,9 | 50,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 18 | 04:45 | 41,6 | 48,7 |
| 19 | 05:00 | 43,1 | 51,0 |
| 20 | 05:15 | 42,5 | 50,6 |
| 21 | 05:30 | 42,3 | 50,4 |
| 22 | 05:45 | 39,7 | 48,6 |
| 23 | 06:00 | 40,3 | 47,6 |
| 24 | 06:15 | 41,7 | 49,7 |
| 25 | 06:30 | 42,3 | 50,8 |
| 26 | 06:45 | 41,7 | 51,4 |
| 27 | 07:00 | 44,5 | 52,9 |
| 28 | 07:15 | 46,8 | 54,7 |
| 29 | 07:30 | 48,1 | 56,4 |
| 30 | 07:45 | 49,8 | 55,4 |
| 31 | 08:00 | 48,6 | 55,8 |
| 32 | 08:15 | 51,6 | 59,7 |
| 33 | 08:30 | 51,1 | 56,4 |
| 34 | 08:45 | 53,7 | 58,8 |
| 35 | 09:00 | 54,9 | 61,9 |
| 36 | 09:15 | 55,2 | 62,5 |
| 37 | 09:30 | 54,4 | 64,6 |
| 38 | 09:45 | 54,6 | 58,9 |
| 39 | 10:00 | 53,1 | 60,3 |
| 40 | 10:15 | 55,9 | 63,6 |
| 41 | 10:30 | 56,1 | 62,2 |
| 42 | 10:45 | 54,4 | 60,2 |
| 43 | 11:00 | 53,7 | 58,7 |
| 44 | 11:15 | 52,0 | 58,9 |
| 45 | 11:30 | 55,2 | 60,0 |
| 46 | 11:45 | 54,4 | 59,3 |
| 47 | 12:00 | 53,2 | 58,7 |
| 48 | 12:15 | 50,4 | 56,3 |
| 49 | 12:30 | 52,9 | 58,7 |
| 50 | 12:45 | 52,6 | 56,4 |
| 51 | 13:00 | 50,9 | 59,1 |
| 52 | 13:15 | 51,8 | 57,8 |
| 53 | 13:30 | 54,7 | 61,8 |
| 54 | 13:45 | 53,0 | 59,2 |
| 55 | 14:00 | 55,4 | 62,5 |
| 56 | 14:15 | 55,1 | 60,3 |
| 57 | 14:30 | 56,6 | 65,1 |
| 58 | 14:45 | 55,1 | 60,4 |
| 59 | 15:00 | 57,7 | 65,6 |
| 60 | 15:15 | 55,1 | 61,4 |
| 61 | 15:30 | 56,4 | 64,5 |
| 62 | 15:45 | 52,7 | 59,3 |
| 63 | 16:00 | 55,6 | 60,2 |
| 64 | 16:15 | 57,0 | 64,9 |
| 65 | 16:30 | 52,4 | 59,9 |
| 66 | 16:45 | 54,9 | 61,7 |
| 67 | 17:00 | 53,2 | 60,3 |
| 68 | 17:15 | 56,1 | 60,8 |
| 69 | 17:30 | 53,7 | 64,5 |
| 70 | 17:45 | 55,9 | 65,8 |
| 71 | 18:00 | 52,0 | 63,5 |
| 72 | 18:15 | 50,2 | 59,4 |
| 73 | 18:30 | 50,5 | 57,8 |
| 74 | 18:45 | 46,7 | 55,5 |
| 75 | 19:00 | 49,8 | 56,7 |
| 76 | 19:15 | 48,9 | 57,2 |
| 77 | 19:30 | 50,2 | 58,7 |
| 78 | 19:45 | 49,5 | 57,8 |
| 79 | 20:00 | 50,2 | 57,2 |
| 80 | 20:15 | 48,1 | 54,1 |
| 81 | 20:30 | 45,1 | 54,7 |
| 82 | 20:45 | 41,6 | 50,1 |
| 83 | 21:00 | 44,6 | 52,9 |
| 84 | 21:15 | 42,4 | 49,1 |
| 85 | 21:30 | 46,6 | 54,5 |
| 86 | 21:45 | 43,5 | 51,0 |
| 87 | 22:00 | 43,2 | 50,6 |
| 88 | 22:15 | 44,0 | 51,5 |
| 89 | 22:30 | 41,2 | 48,6 |
| 90 | 22:45 | 43,2 | 51,5 |
| 91 | 23:00 | 43,8 | 52,3 |
| 92 | 23:15 | 46,8 | 56,3 |
| 93 | 23:30 | 44,1 | 53,7 |
| 94 | 23:45 | 44,7 | 52,9 |
| 95 | 00:00 | 42,0 | 49,8 |
| 96 | 00:15 | 44,5 | 53,3 |

**1.GÜN**
**29-30.09.2022**
**66.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,5 | 57,2 |
| 2 | 00:45 | 40,3 | 59,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 3 | 01:00 | 42,1 | 62,6 | 47 | 12:00 | 50,7 | 57,2 |
| 4 | 01:15 | 44,4 | 64,1 | 48 | 12:15 | 51,3 | 54,8 |
| 5 | 01:30 | 44,9 | 64,4 | 49 | 12:30 | 51,4 | 56,2 |
| 6 | 01:45 | 44,6 | 65,0 | 50 | 12:45 | 51,6 | 56,8 |
| 7 | 02:00 | 44,0 | 59,6 | 51 | 13:00 | 51,1 | 58,4 |
| 8 | 02:15 | 43,3 | 59,3 | 52 | 13:15 | 52,9 | 57,2 |
| 9 | 02:30 | 41,9 | 59,8 | 53 | 13:30 | 51,9 | 55,8 |
| 10 | 02:45 | 42,2 | 60,1 | 54 | 13:45 | 51,5 | 58,1 |
| 11 | 03:00 | 42,4 | 56,6 | 55 | 14:00 | 51,7 | 55,2 |
| 12 | 03:15 | 42,0 | 59,3 | 56 | 14:15 | 50,9 | 57,3 |
| 13 | 03:30 | 42,4 | 62,7 | 57 | 14:30 | 48,3 | 54,1 |
| 14 | 03:45 | 42,0 | 64,9 | 58 | 14:45 | 49,7 | 55,8 |
| 15 | 04:00 | 42,2 | 60,4 | 59 | 15:00 | 50,2 | 57,8 |
| 16 | 04:15 | 42,4 | 62,6 | 60 | 15:15 | 50,1 | 57,2 |
| 17 | 04:30 | 41,9 | 61,3 | 61 | 15:30 | 50,3 | 54,4 |
| 18 | 04:45 | 42,7 | 63,0 | 62 | 15:45 | 49,8 | 53,0 |
| 19 | 05:00 | 42,3 | 59,8 | 63 | 16:00 | 50,5 | 57,2 |
| 20 | 05:15 | 41,9 | 59,4 | 64 | 16:15 | 50,1 | 54,8 |
| 21 | 05:30 | 41,6 | 57,4 | 65 | 16:30 | 48,7 | 54,7 |
| 22 | 05:45 | 39,5 | 56,9 | 66 | 16:45 | 49,2 | 53,8 |
| 23 | 06:00 | 37,2 | 56,8 | 67 | 17:00 | 49,8 | 54,6 |
| 24 | 06:15 | 36,7 | 52,9 | 68 | 17:15 | 49,5 | 52,1 |
| 25 | 06:30 | 38,5 | 54,0 | 69 | 17:30 | 49,7 | 56,5 |
| 26 | 06:45 | 38,2 | 51,0 | 70 | 17:45 | 49,8 | 57,7 |
| 27 | 07:00 | 39,8 | 56,0 | 71 | 18:00 | 50,3 | 58,7 |
| 28 | 07:15 | 39,3 | 52,4 | 72 | 18:15 | 50,0 | 58,2 |
| 29 | 07:30 | 42,6 | 54,2 | 73 | 18:30 | 50,4 | 61,4 |
| 30 | 07:45 | 45,3 | 54,7 | 74 | 18:45 | 51,6 | 61,2 |
| 31 | 08:00 | 46,2 | 51,5 | 75 | 19:00 | 51,1 | 60,3 |
| 32 | 08:15 | 47,7 | 53,7 | 76 | 19:15 | 47,4 | 61,1 |
| 33 | 08:30 | 47,6 | 51,4 | 77 | 19:30 | 49,2 | 59,0 |
| 34 | 08:45 | 48,8 | 53,8 | 78 | 19:45 | 47,3 | 62,9 |
| 35 | 09:00 | 49,2 | 55,1 | 79 | 20:00 | 43,2 | 59,0 |
| 36 | 09:15 | 49,3 | 57,0 | 80 | 20:15 | 45,4 | 59,2 |
| 37 | 09:30 | 49,7 | 58,5 | 81 | 20:30 | 42,5 | 61,0 |
| 38 | 09:45 | 50,2 | 55,1 | 82 | 20:45 | 40,2 | 57,2 |
| 39 | 10:00 | 49,5 | 55,4 | 83 | 21:00 | 39,4 | 51,6 |
| 40 | 10:15 | 49,3 | 57,2 | 84 | 21:15 | 39,1 | 51,9 |
| 41 | 10:30 | 49,8 | 56,6 | 85 | 21:30 | 39,4 | 53,8 |
| 42 | 10:45 | 50,3 | 57,5 | 86 | 21:45 | 38,9 | 53,2 |
| 43 | 11:00 | 50,1 | 57,2 | 87 | 22:00 | 38,9 | 51,8 |
| 44 | 11:15 | 51,8 | 57,8 | 88 | 22:15 | 40,2 | 53,9 |
| 45 | 11:30 | 51,4 | 59,4 | 89 | 22:30 | 40,3 | 55,8 |
| 46 | 11:45 | 52,4 | 56,3 | 90 | 22:45 | 40,7 | 52,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 91 | 23:00 | 40,1 | 52,2 |
| 92 | 23:15 | 39,6 | 53,2 |
| 93 | 23:30 | 37,5 | 53,6 |
| 94 | 23:45 | 36,7 | 53,1 |
| 95 | 00:00 | 37,9 | 54,8 |
| 96 | 00:15 | 40,0 | 52,4 |

**2.GÜN**
**20-21.09.2022**
**1.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,0 | 53,8 |
| 2 | 00:45 | 40,1 | 50,7 |
| 3 | 01:00 | 41,9 | 50,3 |
| 4 | 01:15 | 39,8 | 46,7 |
| 5 | 01:30 | 40,6 | 48,7 |
| 6 | 01:45 | 39,0 | 46,3 |
| 7 | 02:00 | 40,1 | 47,5 |
| 8 | 02:15 | 40,6 | 48,6 |
| 9 | 02:30 | 39,8 | 47,3 |
| 10 | 02:45 | 38,0 | 44,9 |
| 11 | 03:00 | 38,4 | 45,7 |
| 12 | 03:15 | 40,1 | 46,7 |
| 13 | 03:30 | 37,4 | 44,6 |
| 14 | 03:45 | 37,1 | 44,7 |
| 15 | 04:00 | 37,7 | 44,3 |
| 16 | 04:15 | 37,7 | 44,6 |
| 17 | 04:30 | 37,5 | 44,7 |
| 18 | 04:45 | 38,7 | 45,7 |
| 19 | 05:00 | 39,2 | 46,0 |
| 20 | 05:15 | 37,5 | 44,2 |
| 21 | 05:30 | 38,5 | 44,9 |
| 22 | 05:45 | 37,1 | 44,9 |
| 23 | 06:00 | 36,8 | 43,7 |
| 24 | 06:15 | 38,3 | 45,7 |
| 25 | 06:30 | 39,4 | 45,8 |
| 26 | 06:45 | 39,0 | 46,1 |
| 27 | 07:00 | 39,1 | 47,5 |
| 28 | 07:15 | 40,8 | 49,3 |
| 29 | 07:30 | 42,2 | 50,8 |
| 30 | 07:45 | 45,9 | 52,9 |
| 31 | 08:00 | 46,3 | 52,5 |
| 32 | 08:15 | 46,5 | 51,5 |
| 33 | 08:30 | 45,9 | 51,3 |
| 34 | 08:45 | 49,7 | 56,0 |
| 35 | 09:00 | 49,6 | 55,3 |
| 36 | 09:15 | 50,9 | 57,3 |
| 37 | 09:30 | 51,7 | 59,3 |
| 38 | 09:45 | 49,7 | 56,6 |
| 39 | 10:00 | 48,8 | 54,0 |
| 40 | 10:15 | 50,8 | 57,0 |
| 41 | 10:30 | 51,0 | 57,0 |
| 42 | 10:45 | 47,1 | 55,3 |
| 43 | 11:00 | 48,7 | 56,2 |
| 44 | 11:15 | 47,8 | 54,8 |
| 45 | 11:30 | 50,4 | 58,7 |
| 46 | 11:45 | 49,9 | 57,4 |
| 47 | 12:00 | 48,4 | 56,1 |
| 48 | 12:15 | 48,7 | 55,7 |
| 49 | 12:30 | 48,6 | 56,0 |
| 50 | 12:45 | 47,4 | 54,3 |
| 51 | 13:00 | 50,4 | 58,1 |
| 52 | 13:15 | 47,8 | 54,1 |
| 53 | 13:30 | 47,9 | 55,3 |
| 54 | 13:45 | 48,2 | 55,2 |
| 55 | 14:00 | 49,9 | 57,7 |
| 56 | 14:15 | 48,7 | 55,0 |
| 57 | 14:30 | 52,4 | 59,3 |
| 58 | 14:45 | 50,5 | 58,2 |
| 59 | 15:00 | 51,7 | 59,3 |
| 60 | 15:15 | 50,3 | 56,8 |
| 61 | 15:30 | 49,1 | 57,3 |
| 62 | 15:45 | 48,8 | 55,5 |
| 63 | 16:00 | 48,0 | 55,4 |
| 64 | 16:15 | 49,9 | 57,6 |
| 65 | 16:30 | 48,6 | 56,1 |
| 66 | 16:45 | 49,9 | 56,4 |
| 67 | 17:00 | 50,1 | 57,7 |
| 68 | 17:15 | 49,6 | 56,3 |
| 69 | 17:30 | 48,0 | 56,0 |
| 70 | 17:45 | 51,8 | 60,0 |
| 71 | 18:00 | 48,8 | 59,2 |
| 72 | 18:15 | 44,4 | 55,0 |
| 73 | 18:30 | 44,7 | 54,3 |
| 74 | 18:45 | 44,4 | 54,7 |
| 75 | 19:00 | 47,3 | 57,3 |
| 76 | 19:15 | 44,7 | 54,8 |
| 77 | 19:30 | 44,5 | 55,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 78 | 19:45 | 43,8 | 53,5 |
| 79 | 20:00 | 45,3 | 54,1 |
| 80 | 20:15 | 45,4 | 54,3 |
| 81 | 20:30 | 42,0 | 50,5 |
| 82 | 20:45 | 39,6 | 47,5 |
| 83 | 21:00 | 40,6 | 49,4 |
| 84 | 21:15 | 40,2 | 48,4 |
| 85 | 21:30 | 40,8 | 48,3 |
| 86 | 21:45 | 39,9 | 47,6 |
| 87 | 22:00 | 39,4 | 46,2 |
| 88 | 22:15 | 40,5 | 46,2 |
| 89 | 22:30 | 37,7 | 44,9 |
| 90 | 22:45 | 41,2 | 47,5 |
| 91 | 23:00 | 40,9 | 49,5 |
| 92 | 23:15 | 40,6 | 48,7 |
| 93 | 23:30 | 41,6 | 48,6 |
| 94 | 23:45 | 40,7 | 46,7 |
| 95 | 00:00 | 39,9 | 45,6 |
| 96 | 00:15 | 41,3 | 47,6 |

**2.GÜN**
**20-21.09.2022**
**2.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,3 | 48,7 |
| 2 | 00:45 | 41,2 | 49,4 |
| 3 | 01:00 | 41,6 | 52,0 |
| 4 | 01:15 | 39,6 | 48,2 |
| 5 | 01:30 | 42,6 | 51,4 |
| 6 | 01:45 | 40,8 | 48,7 |
| 7 | 02:00 | 41,7 | 49,0 |
| 8 | 02:15 | 42,3 | 50,2 |
| 9 | 02:30 | 40,2 | 49,8 |
| 10 | 02:45 | 40,9 | 49,3 |
| 11 | 03:00 | 44,0 | 53,6 |
| 12 | 03:15 | 44,1 | 54,9 |
| 13 | 03:30 | 42,3 | 52,3 |
| 14 | 03:45 | 43,5 | 53,3 |
| 15 | 04:00 | 43,5 | 52,7 |
| 16 | 04:15 | 41,9 | 50,9 |
| 17 | 04:30 | 42,3 | 49,8 |
| 18 | 04:45 | 42,2 | 51,2 |
| 19 | 05:00 | 43,7 | 53,1 |
| 20 | 05:15 | 39,9 | 49,4 |
| 21 | 05:30 | 40,9 | 50,4 |
| 22 | 05:45 | 39,2 | 47,3 |
| 23 | 06:00 | 38,0 | 47,0 |
| 24 | 06:15 | 41,7 | 50,3 |
| 25 | 06:30 | 41,5 | 50,2 |
| 26 | 06:45 | 41,2 | 49,7 |
| 27 | 07:00 | 44,6 | 53,5 |
| 28 | 07:15 | 47,6 | 56,7 |
| 29 | 07:30 | 48,8 | 58,1 |
| 30 | 07:45 | 48,3 | 59,4 |
| 31 | 08:00 | 50,0 | 60,2 |
| 32 | 08:15 | 49,6 | 59,5 |
| 33 | 08:30 | 50,9 | 60,7 |
| 34 | 08:45 | 50,1 | 58,9 |
| 35 | 09:00 | 50,8 | 61,0 |
| 36 | 09:15 | 49,6 | 62,3 |
| 37 | 09:30 | 52,7 | 60,9 |
| 38 | 09:45 | 50,3 | 57,7 |
| 39 | 10:00 | 50,2 | 58,2 |
| 40 | 10:15 | 52,2 | 60,1 |
| 41 | 10:30 | 52,7 | 59,5 |
| 42 | 10:45 | 49,5 | 58,2 |
| 43 | 11:00 | 49,9 | 57,8 |
| 44 | 11:15 | 47,4 | 54,4 |
| 45 | 11:30 | 51,2 | 57,6 |
| 46 | 11:45 | 48,4 | 56,0 |
| 47 | 12:00 | 46,7 | 52,5 |
| 48 | 12:15 | 46,6 | 54,1 |
| 49 | 12:30 | 48,0 | 54,1 |
| 50 | 12:45 | 49,9 | 57,2 |
| 51 | 13:00 | 51,6 | 60,9 |
| 52 | 13:15 | 50,9 | 58,1 |
| 53 | 13:30 | 49,6 | 56,7 |
| 54 | 13:45 | 48,9 | 57,3 |
| 55 | 14:00 | 50,6 | 56,1 |
| 56 | 14:15 | 48,8 | 56,5 |
| 57 | 14:30 | 52,5 | 59,8 |
| 58 | 14:45 | 49,7 | 55,4 |
| 59 | 15:00 | 49,9 | 57,2 |
| 60 | 15:15 | 49,9 | 57,0 |
| 61 | 15:30 | 48,0 | 54,4 |
| 62 | 15:45 | 47,2 | 53,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 63 | 16:00 | 46,7 | 53,8 |
| 64 | 16:15 | 49,1 | 54,1 |
| 65 | 16:30 | 48,2 | 53,4 |
| 66 | 16:45 | 48,2 | 53,2 |
| 67 | 17:00 | 48,7 | 54,4 |
| 68 | 17:15 | 47,4 | 54,6 |
| 69 | 17:30 | 47,2 | 53,6 |
| 70 | 17:45 | 50,1 | 56,9 |
| 71 | 18:00 | 47,7 | 57,6 |
| 72 | 18:15 | 47,0 | 56,8 |
| 73 | 18:30 | 48,4 | 58,7 |
| 74 | 18:45 | 43,0 | 52,4 |
| 75 | 19:00 | 46,6 | 54,9 |
| 76 | 19:15 | 44,4 | 54,0 |
| 77 | 19:30 | 44,9 | 55,1 |
| 78 | 19:45 | 44,9 | 53,9 |
| 79 | 20:00 | 44,2 | 53,1 |
| 80 | 20:15 | 44,4 | 52,4 |
| 81 | 20:30 | 41,5 | 49,9 |
| 82 | 20:45 | 39,6 | 47,3 |
| 83 | 21:00 | 39,3 | 48,7 |
| 84 | 21:15 | 39,7 | 46,9 |
| 85 | 21:30 | 41,2 | 48,2 |
| 86 | 21:45 | 40,3 | 49,7 |
| 87 | 22:00 | 38,6 | 46,9 |
| 88 | 22:15 | 41,0 | 47,6 |
| 89 | 22:30 | 38,0 | 47,1 |
| 90 | 22:45 | 40,3 | 49,9 |
| 91 | 23:00 | 38,3 | 46,6 |
| 92 | 23:15 | 38,8 | 48,4 |
| 93 | 23:30 | 40,0 | 47,7 |
| 94 | 23:45 | 38,3 | 47,2 |
| 95 | 00:00 | 36,7 | 44,6 |
| 96 | 00:15 | 38,6 | 46,6 |

**2.GÜN**
**20-21.09.2022**
**3.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,3 | 50,8 |
| 2 | 00:45 | 42,5 | 49,9 |
| 3 | 01:00 | 44,4 | 53,1 |
| 4 | 01:15 | 42,7 | 48,8 |
| 5 | 01:30 | 44,5 | 52,6 |
| 6 | 01:45 | 42,9 | 52,4 |
| 7 | 02:00 | 42,7 | 50,3 |
| 8 | 02:15 | 44,1 | 53,5 |
| 9 | 02:30 | 43,1 | 51,0 |
| 10 | 02:45 | 43,7 | 50,2 |
| 11 | 03:00 | 43,5 | 52,7 |
| 12 | 03:15 | 46,2 | 53,5 |
| 13 | 03:30 | 42,7 | 53,5 |
| 14 | 03:45 | 42,7 | 52,1 |
| 15 | 04:00 | 42,5 | 51,9 |
| 16 | 04:15 | 42,2 | 52,2 |
| 17 | 04:30 | 44,0 | 52,1 |
| 18 | 04:45 | 43,1 | 53,5 |
| 19 | 05:00 | 43,7 | 53,7 |
| 20 | 05:15 | 41,5 | 50,0 |
| 21 | 05:30 | 41,1 | 51,8 |
| 22 | 05:45 | 40,2 | 48,6 |
| 23 | 06:00 | 40,0 | 49,9 |
| 24 | 06:15 | 41,6 | 51,1 |
| 25 | 06:30 | 42,8 | 51,9 |
| 26 | 06:45 | 43,3 | 53,3 |
| 27 | 07:00 | 42,6 | 52,0 |
| 28 | 07:15 | 45,7 | 55,2 |
| 29 | 07:30 | 45,3 | 56,8 |
| 30 | 07:45 | 50,8 | 59,5 |
| 31 | 08:00 | 54,4 | 60,9 |
| 32 | 08:15 | 53,4 | 62,0 |
| 33 | 08:30 | 53,8 | 63,4 |
| 34 | 08:45 | 53,4 | 64,2 |
| 35 | 09:00 | 54,7 | 62,6 |
| 36 | 09:15 | 53,7 | 64,0 |
| 37 | 09:30 | 54,9 | 63,5 |
| 38 | 09:45 | 52,6 | 58,9 |
| 39 | 10:00 | 50,9 | 58,0 |
| 40 | 10:15 | 53,5 | 62,0 |
| 41 | 10:30 | 55,3 | 61,7 |
| 42 | 10:45 | 51,8 | 57,2 |
| 43 | 11:00 | 53,1 | 60,8 |
| 44 | 11:15 | 51,1 | 59,2 |
| 45 | 11:30 | 54,9 | 64,0 |
| 46 | 11:45 | 52,4 | 60,6 |
| 47 | 12:00 | 51,1 | 58,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 48 | 12:15 | 50,8 | 56,9 |
| 49 | 12:30 | 51,3 | 58,7 |
| 50 | 12:45 | 51,7 | 56,6 |
| 51 | 13:00 | 54,3 | 59,7 |
| 52 | 13:15 | 51,8 | 57,5 |
| 53 | 13:30 | 52,4 | 56,6 |
| 54 | 13:45 | 51,1 | 56,7 |
| 55 | 14:00 | 53,1 | 59,4 |
| 56 | 14:15 | 51,9 | 58,7 |
| 57 | 14:30 | 55,3 | 61,2 |
| 58 | 14:45 | 52,0 | 56,9 |
| 59 | 15:00 | 52,2 | 58,9 |
| 60 | 15:15 | 52,2 | 58,0 |
| 61 | 15:30 | 49,9 | 56,6 |
| 62 | 15:45 | 48,2 | 53,4 |
| 63 | 16:00 | 48,6 | 55,0 |
| 64 | 16:15 | 52,1 | 55,4 |
| 65 | 16:30 | 49,2 | 54,4 |
| 66 | 16:45 | 49,9 | 55,9 |
| 67 | 17:00 | 48,8 | 56,0 |
| 68 | 17:15 | 50,3 | 57,1 |
| 69 | 17:30 | 51,1 | 58,2 |
| 70 | 17:45 | 53,9 | 61,0 |
| 71 | 18:00 | 50,4 | 60,1 |
| 72 | 18:15 | 50,5 | 60,5 |
| 73 | 18:30 | 51,2 | 60,5 |
| 74 | 18:45 | 49,1 | 57,8 |
| 75 | 19:00 | 51,7 | 62,0 |
| 76 | 19:15 | 50,4 | 58,9 |
| 77 | 19:30 | 51,0 | 57,5 |
| 78 | 19:45 | 50,8 | 58,9 |
| 79 | 20:00 | 50,9 | 57,8 |
| 80 | 20:15 | 50,2 | 59,0 |
| 81 | 20:30 | 46,5 | 56,1 |
| 82 | 20:45 | 45,7 | 52,8 |
| 83 | 21:00 | 46,6 | 55,0 |
| 84 | 21:15 | 44,8 | 52,9 |
| 85 | 21:30 | 47,0 | 54,2 |
| 86 | 21:45 | 45,5 | 54,4 |
| 87 | 22:00 | 43,2 | 51,6 |
| 88 | 22:15 | 44,3 | 52,6 |
| 89 | 22:30 | 43,1 | 51,3 |
| 90 | 22:45 | 46,2 | 54,2 |
| 91 | 23:00 | 43,8 | 51,1 |
| 92 | 23:15 | 42,9 | 51,2 |
| 93 | 23:30 | 43,8 | 50,8 |
| 94 | 23:45 | 41,4 | 49,9 |
| 95 | 00:00 | 40,8 | 48,8 |
| 96 | 00:15 | 42,6 | 51,1 |

**2.GÜN**
**20-21.09.2022**
**4.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,1 | 54,5 |
| 2 | 00:45 | 37,1 | 54,3 |
| 3 | 01:00 | 37,6 | 54,1 |
| 4 | 01:15 | 38,9 | 59,5 |
| 5 | 01:30 | 40,7 | 57,0 |
| 6 | 01:45 | 40,7 | 58,0 |
| 7 | 02:00 | 39,1 | 56,7 |
| 8 | 02:15 | 41,1 | 57,3 |
| 9 | 02:30 | 37,8 | 55,9 |
| 10 | 02:45 | 38,1 | 55,1 |
| 11 | 03:00 | 38,6 | 54,8 |
| 12 | 03:15 | 37,7 | 56,2 |
| 13 | 03:30 | 38,9 | 56,6 |
| 14 | 03:45 | 37,4 | 56,1 |
| 15 | 04:00 | 37,5 | 57,4 |
| 16 | 04:15 | 38,1 | 56,5 |
| 17 | 04:30 | 37,3 | 53,5 |
| 18 | 04:45 | 36,5 | 54,6 |
| 19 | 05:00 | 39,0 | 56,6 |
| 20 | 05:15 | 37,2 | 53,7 |
| 21 | 05:30 | 38,8 | 58,4 |
| 22 | 05:45 | 39,4 | 55,3 |
| 23 | 06:00 | 35,4 | 52,4 |
| 24 | 06:15 | 37,6 | 53,2 |
| 25 | 06:30 | 38,0 | 54,1 |
| 26 | 06:45 | 37,6 | 53,3 |
| 27 | 07:00 | 42,0 | 57,2 |
| 28 | 07:15 | 39,7 | 54,1 |
| 29 | 07:30 | 39,5 | 52,7 |
| 30 | 07:45 | 40,5 | 53,6 |
| 31 | 08:00 | 39,9 | 55,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 32 | 08:15 | 44,2 | 58,6 |
| 33 | 08:30 | 44,5 | 61,0 |
| 34 | 08:45 | 48,9 | 59,7 |
| 35 | 09:00 | 49,4 | 60,3 |
| 36 | 09:15 | 49,7 | 58,7 |
| 37 | 09:30 | 49,9 | 60,8 |
| 38 | 09:45 | 49,9 | 60,0 |
| 39 | 10:00 | 47,7 | 59,3 |
| 40 | 10:15 | 48,4 | 61,3 |
| 41 | 10:30 | 47,7 | 60,5 |
| 42 | 10:45 | 48,4 | 62,2 |
| 43 | 11:00 | 48,3 | 60,8 |
| 44 | 11:15 | 47,7 | 58,6 |
| 45 | 11:30 | 48,6 | 60,0 |
| 46 | 11:45 | 49,6 | 61,3 |
| 47 | 12:00 | 47,3 | 58,1 |
| 48 | 12:15 | 46,2 | 61,4 |
| 49 | 12:30 | 47,4 | 59,2 |
| 50 | 12:45 | 49,9 | 60,5 |
| 51 | 13:00 | 51,1 | 59,7 |
| 52 | 13:15 | 52,3 | 63,3 |
| 53 | 13:30 | 48,2 | 59,3 |
| 54 | 13:45 | 48,0 | 57,2 |
| 55 | 14:00 | 47,4 | 59,9 |
| 56 | 14:15 | 47,8 | 57,9 |
| 57 | 14:30 | 47,9 | 59,3 |
| 58 | 14:45 | 47,4 | 59,7 |
| 59 | 15:00 | 49,1 | 57,7 |
| 60 | 15:15 | 48,5 | 59,6 |
| 61 | 15:30 | 49,1 | 59,2 |
| 62 | 15:45 | 47,9 | 59,0 |
| 63 | 16:00 | 48,9 | 58,6 |
| 64 | 16:15 | 47,7 | 59,3 |
| 65 | 16:30 | 46,3 | 57,8 |
| 66 | 16:45 | 47,1 | 57,5 |
| 67 | 17:00 | 47,2 | 59,3 |
| 68 | 17:15 | 47,8 | 58,5 |
| 69 | 17:30 | 47,5 | 59,7 |
| 70 | 17:45 | 46,6 | 58,3 |
| 71 | 18:00 | 46,3 | 59,6 |
| 72 | 18:15 | 42,1 | 59,9 |
| 73 | 18:30 | 40,8 | 60,4 |
| 74 | 18:45 | 38,0 | 56,8 |
| 75 | 19:00 | 39,3 | 57,6 |
| 76 | 19:15 | 35,6 | 54,3 |
| 77 | 19:30 | 35,7 | 54,3 |
| 78 | 19:45 | 37,8 | 57,6 |
| 79 | 20:00 | 37,3 | 58,2 |
| 80 | 20:15 | 36,8 | 56,3 |
| 81 | 20:30 | 38,0 | 59,3 |
| 82 | 20:45 | 39,9 | 62,6 |
| 83 | 21:00 | 39,3 | 60,7 |
| 84 | 21:15 | 38,7 | 57,9 |
| 85 | 21:30 | 37,8 | 58,5 |
| 86 | 21:45 | 40,0 | 58,5 |
| 87 | 22:00 | 39,1 | 57,3 |
| 88 | 22:15 | 40,2 | 60,9 |
| 89 | 22:30 | 40,9 | 61,6 |
| 90 | 22:45 | 39,4 | 57,3 |
| 91 | 23:00 | 42,2 | 55,5 |
| 92 | 23:15 | 45,3 | 61,1 |
| 93 | 23:30 | 40,1 | 56,1 |
| 94 | 23:45 | 39,4 | 55,4 |
| 95 | 00:00 | 39,0 | 57,6 |
| 96 | 00:15 | 40,4 | 60,7 |

**2.GÜN**
**20-21.09.2022**
**5.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 45,0 | 57,2 |
| 2 | 00:45 | 37,7 | 57,2 |
| 3 | 01:00 | 38,9 | 60,8 |
| 4 | 01:15 | 40,2 | 61,2 |
| 5 | 01:30 | 43,1 | 61,9 |
| 6 | 01:45 | 43,1 | 61,7 |
| 7 | 02:00 | 41,2 | 59,5 |
| 8 | 02:15 | 43,3 | 60,5 |
| 9 | 02:30 | 39,8 | 57,5 |
| 10 | 02:45 | 40,1 | 58,7 |
| 11 | 03:00 | 40,8 | 59,4 |
| 12 | 03:15 | 39,6 | 58,9 |
| 13 | 03:30 | 41,0 | 59,2 |
| 14 | 03:45 | 40,4 | 58,6 |
| 15 | 04:00 | 40,4 | 60,8 |
| 16 | 04:15 | 41,0 | 58,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 17 | 04:30 | 40,2 | 57,9 |
| 18 | 04:45 | 39,4 | 55,6 |
| 19 | 05:00 | 42,3 | 57,3 |
| 20 | 05:15 | 39,2 | 57,7 |
| 21 | 05:30 | 41,0 | 59,5 |
| 22 | 05:45 | 41,6 | 58,8 |
| 23 | 06:00 | 37,2 | 52,8 |
| 24 | 06:15 | 39,5 | 58,2 |
| 25 | 06:30 | 40,0 | 56,4 |
| 26 | 06:45 | 39,5 | 58,2 |
| 27 | 07:00 | 43,9 | 60,4 |
| 28 | 07:15 | 41,3 | 57,0 |
| 29 | 07:30 | 40,4 | 55,6 |
| 30 | 07:45 | 40,7 | 56,4 |
| 31 | 08:00 | 40,7 | 56,5 |
| 32 | 08:15 | 40,3 | 54,7 |
| 33 | 08:30 | 41,2 | 56,9 |
| 34 | 08:45 | 46,4 | 61,1 |
| 35 | 09:00 | 47,9 | 63,3 |
| 36 | 09:15 | 47,5 | 63,5 |
| 37 | 09:30 | 47,4 | 63,3 |
| 38 | 09:45 | 47,5 | 63,7 |
| 39 | 10:00 | 46,9 | 58,7 |
| 40 | 10:15 | 46,8 | 61,3 |
| 41 | 10:30 | 47,1 | 59,4 |
| 42 | 10:45 | 47,4 | 61,8 |
| 43 | 11:00 | 47,5 | 61,8 |
| 44 | 11:15 | 48,6 | 62,4 |
| 45 | 11:30 | 49,4 | 63,4 |
| 46 | 11:45 | 50,0 | 65,0 |
| 47 | 12:00 | 47,5 | 60,6 |
| 48 | 12:15 | 47,3 | 62,0 |
| 49 | 12:30 | 48,6 | 62,8 |
| 50 | 12:45 | 51,8 | 64,3 |
| 51 | 13:00 | 50,8 | 64,7 |
| 52 | 13:15 | 50,9 | 66,4 |
| 53 | 13:30 | 51,2 | 64,9 |
| 54 | 13:45 | 51,9 | 66,4 |
| 55 | 14:00 | 51,2 | 66,7 |
| 56 | 14:15 | 49,4 | 65,8 |
| 57 | 14:30 | 49,3 | 67,2 |
| 58 | 14:45 | 52,0 | 66,8 |
| 59 | 15:00 | 51,9 | 68,3 |
| 60 | 15:15 | 51,4 | 65,6 |
| 61 | 15:30 | 49,8 | 66,8 |
| 62 | 15:45 | 52,9 | 67,7 |
| 63 | 16:00 | 49,8 | 69,4 |
| 64 | 16:15 | 50,0 | 67,7 |
| 65 | 16:30 | 49,5 | 65,3 |
| 66 | 16:45 | 50,1 | 67,0 |
| 67 | 17:00 | 50,4 | 67,8 |
| 68 | 17:15 | 51,2 | 65,1 |
| 69 | 17:30 | 52,9 | 68,9 |
| 70 | 17:45 | 49,7 | 70,2 |
| 71 | 18:00 | 52,9 | 68,9 |
| 72 | 18:15 | 47,4 | 62,5 |
| 73 | 18:30 | 46,8 | 64,2 |
| 74 | 18:45 | 43,0 | 61,4 |
| 75 | 19:00 | 42,7 | 62,5 |
| 76 | 19:15 | 38,5 | 58,4 |
| 77 | 19:30 | 37,6 | 56,8 |
| 78 | 19:45 | 39,8 | 60,2 |
| 79 | 20:00 | 39,9 | 60,6 |
| 80 | 20:15 | 39,4 | 61,4 |
| 81 | 20:30 | 40,9 | 62,6 |
| 82 | 20:45 | 42,8 | 63,7 |
| 83 | 21:00 | 42,1 | 63,3 |
| 84 | 21:15 | 43,3 | 60,3 |
| 85 | 21:30 | 42,3 | 58,8 |
| 86 | 21:45 | 42,8 | 60,7 |
| 87 | 22:00 | 42,1 | 61,5 |
| 88 | 22:15 | 43,0 | 63,6 |
| 89 | 22:30 | 43,9 | 63,1 |
| 90 | 22:45 | 41,9 | 59,0 |
| 91 | 23:00 | 45,2 | 63,5 |
| 92 | 23:15 | 45,7 | 68,5 |
| 93 | 23:30 | 42,4 | 61,3 |
| 94 | 23:45 | 42,0 | 62,6 |
| 95 | 00:00 | 43,5 | 61,7 |
| 96 | 00:15 | 44,6 | 65,0 |

**2.GÜN**
**20-21.09.2022**
**6.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,5 | 51,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2 | 00:45 | 40,5 | 50,9 | 46 | 11:45 | 49,5 | 57,7 |
| 3 | 01:00 | 39,8 | 50,7 | 47 | 12:00 | 47,1 | 54,7 |
| 4 | 01:15 | 41,3 | 55,7 | 48 | 12:15 | 46,2 | 57,8 |
| 5 | 01:30 | 41,1 | 54,2 | 49 | 12:30 | 47,2 | 55,8 |
| 6 | 01:45 | 41,2 | 55,2 | 50 | 12:45 | 49,8 | 56,9 |
| 7 | 02:00 | 41,5 | 56,7 | 51 | 13:00 | 51,0 | 56,2 |
| 8 | 02:15 | 41,4 | 54,5 | 52 | 13:15 | 52,1 | 59,5 |
| 9 | 02:30 | 38,4 | 53,5 | 53 | 13:30 | 52,1 | 60,6 |
| 10 | 02:45 | 38,7 | 52,7 | 54 | 13:45 | 51,8 | 58,3 |
| 11 | 03:00 | 39,2 | 52,5 | 55 | 14:00 | 51,2 | 61,2 |
| 12 | 03:15 | 38,3 | 53,9 | 56 | 14:15 | 51,6 | 59,1 |
| 13 | 03:30 | 38,6 | 52,9 | 57 | 14:30 | 51,7 | 60,6 |
| 14 | 03:45 | 37,8 | 53,5 | 58 | 14:45 | 51,2 | 60,9 |
| 15 | 04:00 | 37,9 | 54,8 | 59 | 15:00 | 53,2 | 58,9 |
| 16 | 04:15 | 38,6 | 53,9 | 60 | 15:15 | 52,4 | 60,8 |
| 17 | 04:30 | 37,7 | 51,1 | 61 | 15:30 | 53,2 | 60,4 |
| 18 | 04:45 | 39,5 | 55,8 | 62 | 15:45 | 51,7 | 60,2 |
| 19 | 05:00 | 40,3 | 55,0 | 63 | 16:00 | 53,0 | 59,8 |
| 20 | 05:15 | 39,8 | 54,2 | 64 | 16:15 | 51,5 | 60,6 |
| 21 | 05:30 | 40,1 | 56,7 | 65 | 16:30 | 50,2 | 59,0 |
| 22 | 05:45 | 40,7 | 53,5 | 66 | 16:45 | 50,9 | 58,7 |
| 23 | 06:00 | 37,8 | 52,9 | 67 | 17:00 | 51,0 | 60,6 |
| 24 | 06:15 | 38,0 | 50,9 | 68 | 17:15 | 51,6 | 59,7 |
| 25 | 06:30 | 38,5 | 51,6 | 69 | 17:30 | 52,4 | 62,0 |
| 26 | 06:45 | 38,0 | 51,0 | 70 | 17:45 | 51,6 | 60,8 |
| 27 | 07:00 | 42,6 | 54,7 | 71 | 18:00 | 51,2 | 61,9 |
| 28 | 07:15 | 43,9 | 56,4 | 72 | 18:15 | 46,4 | 62,5 |
| 29 | 07:30 | 43,7 | 55,0 | 73 | 18:30 | 45,1 | 62,9 |
| 30 | 07:45 | 44,6 | 55,9 | 74 | 18:45 | 42,1 | 59,1 |
| 31 | 08:00 | 44,0 | 57,4 | 75 | 19:00 | 43,3 | 60,1 |
| 32 | 08:15 | 44,1 | 55,3 | 76 | 19:15 | 39,3 | 56,6 |
| 33 | 08:30 | 47,5 | 57,3 | 77 | 19:30 | 39,5 | 56,6 |
| 34 | 08:45 | 45,1 | 56,2 | 78 | 19:45 | 41,7 | 60,1 |
| 35 | 09:00 | 49,3 | 56,7 | 79 | 20:00 | 41,2 | 60,6 |
| 36 | 09:15 | 47,7 | 55,4 | 80 | 20:15 | 40,7 | 58,6 |
| 37 | 09:30 | 46,1 | 57,2 | 81 | 20:30 | 40,5 | 59,5 |
| 38 | 09:45 | 50,0 | 56,6 | 82 | 20:45 | 41,0 | 60,6 |
| 39 | 10:00 | 47,5 | 56,0 | 83 | 21:00 | 40,4 | 58,9 |
| 40 | 10:15 | 48,3 | 57,7 | 84 | 21:15 | 39,8 | 56,1 |
| 41 | 10:30 | 47,5 | 56,9 | 85 | 21:30 | 38,8 | 56,7 |
| 42 | 10:45 | 48,3 | 58,5 | 86 | 21:45 | 41,0 | 56,5 |
| 43 | 11:00 | 48,2 | 57,2 | 87 | 22:00 | 40,2 | 55,5 |
| 44 | 11:15 | 47,5 | 55,3 | 88 | 22:15 | 41,2 | 58,9 |
| 45 | 11:30 | 48,5 | 56,6 | 89 | 22:30 | 41,8 | 59,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 90 | 22:45 | 40,4 | 55,5 |
| 91 | 23:00 | 43,2 | 53,6 |
| 92 | 23:15 | 42,6 | 59,0 |
| 93 | 23:30 | 43,9 | 57,9 |
| 94 | 23:45 | 43,0 | 56,9 |
| 95 | 00:00 | 42,6 | 59,3 |
| 96 | 00:15 | 41,4 | 58,6 |

**2.GÜN**
**20-21.09.2022**
**7.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,7 | 58,8 |
| 2 | 00:45 | 40,2 | 58,6 |
| 3 | 01:00 | 41,5 | 58,3 |
| 4 | 01:15 | 43,1 | 64,2 |
| 5 | 01:30 | 42,9 | 62,6 |
| 6 | 01:45 | 44,5 | 65,7 |
| 7 | 02:00 | 42,5 | 64,3 |
| 8 | 02:15 | 44,7 | 65,0 |
| 9 | 02:30 | 41,0 | 63,5 |
| 10 | 02:45 | 41,4 | 62,4 |
| 11 | 03:00 | 41,9 | 62,2 |
| 12 | 03:15 | 39,3 | 61,4 |
| 13 | 03:30 | 39,7 | 60,3 |
| 14 | 03:45 | 38,5 | 60,4 |
| 15 | 04:00 | 38,6 | 61,8 |
| 16 | 04:15 | 41,9 | 64,7 |
| 17 | 04:30 | 40,9 | 61,2 |
| 18 | 04:45 | 40,0 | 62,6 |
| 19 | 05:00 | 42,9 | 64,9 |
| 20 | 05:15 | 40,7 | 61,5 |
| 21 | 05:30 | 42,6 | 66,9 |
| 22 | 05:45 | 43,3 | 63,4 |
| 23 | 06:00 | 38,8 | 60,1 |
| 24 | 06:15 | 41,3 | 61,0 |
| 25 | 06:30 | 41,6 | 62,0 |
| 26 | 06:45 | 41,3 | 61,1 |
| 27 | 07:00 | 46,2 | 65,5 |
| 28 | 07:15 | 43,6 | 62,0 |
| 29 | 07:30 | 46,8 | 65,2 |
| 30 | 07:45 | 47,9 | 66,2 |
| 31 | 08:00 | 47,2 | 68,1 |
| 32 | 08:15 | 49,8 | 69,0 |
| 33 | 08:30 | 50,1 | 71,6 |
| 34 | 08:45 | 52,6 | 70,0 |
| 35 | 09:00 | 51,7 | 65,7 |
| 36 | 09:15 | 52,1 | 64,1 |
| 37 | 09:30 | 52,1 | 66,2 |
| 38 | 09:45 | 52,2 | 65,4 |
| 39 | 10:00 | 49,7 | 64,7 |
| 40 | 10:15 | 50,6 | 66,7 |
| 41 | 10:30 | 49,7 | 65,9 |
| 42 | 10:45 | 50,6 | 67,8 |
| 43 | 11:00 | 50,4 | 66,2 |
| 44 | 11:15 | 49,7 | 64,0 |
| 45 | 11:30 | 50,7 | 65,4 |
| 46 | 11:45 | 51,9 | 66,7 |
| 47 | 12:00 | 49,2 | 63,4 |
| 48 | 12:15 | 48,2 | 66,8 |
| 49 | 12:30 | 49,3 | 64,4 |
| 50 | 12:45 | 52,1 | 65,9 |
| 51 | 13:00 | 53,2 | 64,9 |
| 52 | 13:15 | 54,5 | 68,9 |
| 53 | 13:30 | 52,4 | 67,3 |
| 54 | 13:45 | 52,2 | 64,9 |
| 55 | 14:00 | 51,4 | 68,0 |
| 56 | 14:15 | 51,8 | 65,7 |
| 57 | 14:30 | 52,1 | 67,3 |
| 58 | 14:45 | 51,4 | 67,7 |
| 59 | 15:00 | 53,6 | 65,5 |
| 60 | 15:15 | 52,7 | 67,5 |
| 61 | 15:30 | 53,6 | 66,9 |
| 62 | 15:45 | 52,1 | 66,7 |
| 63 | 16:00 | 53,3 | 66,3 |
| 64 | 16:15 | 51,7 | 67,3 |
| 65 | 16:30 | 50,3 | 65,5 |
| 66 | 16:45 | 51,0 | 65,4 |
| 67 | 17:00 | 51,1 | 67,3 |
| 68 | 17:15 | 51,8 | 66,2 |
| 69 | 17:30 | 52,2 | 68,3 |
| 70 | 17:45 | 51,1 | 66,7 |
| 71 | 18:00 | 50,8 | 68,2 |
| 72 | 18:15 | 46,2 | 68,7 |
| 73 | 18:30 | 44,8 | 69,2 |
| 74 | 18:45 | 41,8 | 65,0 |
| 75 | 19:00 | 43,0 | 66,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 76 | 19:15 | 39,0 | 62,3 |
| 77 | 19:30 | 39,1 | 62,3 |
| 78 | 19:45 | 41,5 | 66,0 |
| 79 | 20:00 | 40,9 | 66,6 |
| 80 | 20:15 | 40,4 | 64,5 |
| 81 | 20:30 | 41,6 | 67,9 |
| 82 | 20:45 | 43,7 | 71,7 |
| 83 | 21:00 | 43,0 | 69,6 |
| 84 | 21:15 | 42,4 | 66,2 |
| 85 | 21:30 | 41,5 | 67,1 |
| 86 | 21:45 | 43,9 | 66,9 |
| 87 | 22:00 | 42,9 | 65,7 |
| 88 | 22:15 | 44,2 | 69,8 |
| 89 | 22:30 | 44,9 | 70,6 |
| 90 | 22:45 | 43,1 | 65,7 |
| 91 | 23:00 | 46,3 | 63,6 |
| 92 | 23:15 | 45,3 | 70,0 |
| 93 | 23:30 | 44,1 | 64,4 |
| 94 | 23:45 | 43,2 | 63,5 |
| 95 | 00:00 | 42,8 | 66,0 |
| 96 | 00:15 | 44,4 | 69,5 |

**2.GÜN**
**20-21.09.2022**
**8.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 36,5 | 52,9 |
| 2 | 00:45 | 37,5 | 51,0 |
| 3 | 01:00 | 36,2 | 53,3 |
| 4 | 01:15 | 38,6 | 58,2 |
| 5 | 01:30 | 40,4 | 55,9 |
| 6 | 01:45 | 41,8 | 53,5 |
| 7 | 02:00 | 41,6 | 49,4 |
| 8 | 02:15 | 40,4 | 58,8 |
| 9 | 02:30 | 40,5 | 54,3 |
| 10 | 02:45 | 40,3 | 54,4 |
| 11 | 03:00 | 40,4 | 49,3 |
| 12 | 03:15 | 41,3 | 53,2 |
| 13 | 03:30 | 40,5 | 54,6 |
| 14 | 03:45 | 40,5 | 56,9 |
| 15 | 04:00 | 40,3 | 52,7 |
| 16 | 04:15 | 40,1 | 54,0 |
| 17 | 04:30 | 41,8 | 58,7 |
| 18 | 04:45 | 40,3 | 59,4 |
| 19 | 05:00 | 42,1 | 54,6 |
| 20 | 05:15 | 41,7 | 54,2 |
| 21 | 05:30 | 41,4 | 52,2 |
| 22 | 05:45 | 39,6 | 49,6 |
| 23 | 06:00 | 37,4 | 49,9 |
| 24 | 06:15 | 36,7 | 48,1 |
| 25 | 06:30 | 38,3 | 49,1 |
| 26 | 06:45 | 38,1 | 50,8 |
| 27 | 07:00 | 40,1 | 56,1 |
| 28 | 07:15 | 39,6 | 52,4 |
| 29 | 07:30 | 42,3 | 54,2 |
| 30 | 07:45 | 43,9 | 52,4 |
| 31 | 08:00 | 43,7 | 54,2 |
| 32 | 08:15 | 47,4 | 53,6 |
| 33 | 08:30 | 45,8 | 55,7 |
| 34 | 08:45 | 44,8 | 51,1 |
| 35 | 09:00 | 49,0 | 53,6 |
| 36 | 09:15 | 48,1 | 55,4 |
| 37 | 09:30 | 48,5 | 56,9 |
| 38 | 09:45 | 48,8 | 58,2 |
| 39 | 10:00 | 49,4 | 59,3 |
| 40 | 10:15 | 48,7 | 55,7 |
| 41 | 10:30 | 49,2 | 56,8 |
| 42 | 10:45 | 49,8 | 55,7 |
| 43 | 11:00 | 49,6 | 58,3 |
| 44 | 11:15 | 51,0 | 58,8 |
| 45 | 11:30 | 49,1 | 57,1 |
| 46 | 11:45 | 50,2 | 56,3 |
| 47 | 12:00 | 50,6 | 58,2 |
| 48 | 12:15 | 49,0 | 54,6 |
| 49 | 12:30 | 51,1 | 56,1 |
| 50 | 12:45 | 49,4 | 54,5 |
| 51 | 13:00 | 49,4 | 58,7 |
| 52 | 13:15 | 49,2 | 54,2 |
| 53 | 13:30 | 49,7 | 58,6 |
| 54 | 13:45 | 49,2 | 57,2 |
| 55 | 14:00 | 48,7 | 57,6 |
| 56 | 14:15 | 50,7 | 57,1 |
| 57 | 14:30 | 47,4 | 58,1 |
| 58 | 14:45 | 47,3 | 56,5 |
| 59 | 15:00 | 50,1 | 57,5 |
| 60 | 15:15 | 50,0 | 59,6 |
| 61 | 15:30 | 50,2 | 61,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 62 | 15:45 | 48,4 | 61,9 |
| 63 | 16:00 | 50,4 | 59,9 |
| 64 | 16:15 | 50,1 | 57,9 |
| 65 | 16:30 | 46,4 | 54,9 |
| 66 | 16:45 | 48,9 | 56,3 |
| 67 | 17:00 | 47,8 | 54,8 |
| 68 | 17:15 | 47,4 | 52,4 |
| 69 | 17:30 | 49,7 | 59,1 |
| 70 | 17:45 | 49,6 | 60,4 |
| 71 | 18:00 | 47,1 | 54,8 |
| 72 | 18:15 | 46,9 | 54,3 |
| 73 | 18:30 | 47,2 | 58,7 |
| 74 | 18:45 | 49,3 | 59,7 |
| 75 | 19:00 | 48,4 | 57,2 |
| 76 | 19:15 | 46,5 | 61,5 |
| 77 | 19:30 | 49,0 | 58,8 |
| 78 | 19:45 | 50,9 | 62,6 |
| 79 | 20:00 | 50,1 | 57,4 |
| 80 | 20:15 | 43,4 | 56,5 |
| 81 | 20:30 | 42,1 | 60,6 |
| 82 | 20:45 | 38,0 | 54,2 |
| 83 | 21:00 | 39,5 | 49,4 |
| 84 | 21:15 | 44,0 | 49,7 |
| 85 | 21:30 | 39,2 | 53,7 |
| 86 | 21:45 | 44,7 | 50,5 |
| 87 | 22:00 | 38,6 | 49,7 |
| 88 | 22:15 | 38,4 | 49,8 |
| 89 | 22:30 | 38,5 | 53,4 |
| 90 | 22:45 | 41,2 | 54,1 |
| 91 | 23:00 | 37,8 | 52,1 |
| 92 | 23:15 | 40,8 | 54,6 |
| 93 | 23:30 | 36,8 | 55,0 |
| 94 | 23:45 | 37,4 | 54,6 |
| 95 | 00:00 | 37,2 | 55,6 |
| 96 | 00:15 | 35,8 | 52,9 |

**2.GÜN**
**20-21.09.2022**
**9.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,3 | 44,7 |
| 2 | 00:45 | 41,4 | 48,9 |
| 3 | 01:00 | 39,4 | 47,2 |
| 4 | 01:15 | 41,3 | 48,5 |
| 5 | 01:30 | 38,8 | 46,7 |
| 6 | 01:45 | 40,5 | 48,0 |
| 7 | 02:00 | 37,5 | 44,5 |
| 8 | 02:15 | 42,0 | 50,4 |
| 9 | 02:30 | 38,0 | 45,2 |
| 10 | 02:45 | 36,4 | 42,9 |
| 11 | 03:00 | 36,8 | 43,7 |
| 12 | 03:15 | 38,2 | 44,7 |
| 13 | 03:30 | 38,6 | 46,2 |
| 14 | 03:45 | 35,4 | 42,8 |
| 15 | 04:00 | 39,0 | 45,8 |
| 16 | 04:15 | 36,1 | 42,7 |
| 17 | 04:30 | 39,7 | 47,2 |
| 18 | 04:45 | 36,3 | 42,9 |
| 19 | 05:00 | 40,7 | 47,6 |
| 20 | 05:15 | 36,0 | 42,2 |
| 21 | 05:30 | 40,0 | 46,6 |
| 22 | 05:45 | 38,4 | 46,6 |
| 23 | 06:00 | 35,1 | 41,7 |
| 24 | 06:15 | 35,9 | 42,9 |
| 25 | 06:30 | 40,9 | 47,5 |
| 26 | 06:45 | 38,1 | 45,0 |
| 27 | 07:00 | 40,6 | 49,1 |
| 28 | 07:15 | 39,8 | 48,2 |
| 29 | 07:30 | 40,4 | 48,7 |
| 30 | 07:45 | 42,1 | 48,7 |
| 31 | 08:00 | 42,5 | 48,3 |
| 32 | 08:15 | 44,6 | 49,2 |
| 33 | 08:30 | 47,2 | 52,6 |
| 34 | 08:45 | 50,2 | 55,1 |
| 35 | 09:00 | 51,6 | 56,4 |
| 36 | 09:15 | 52,7 | 57,7 |
| 37 | 09:30 | 52,9 | 56,7 |
| 38 | 09:45 | 50,1 | 54,3 |
| 39 | 10:00 | 49,7 | 55,0 |
| 40 | 10:15 | 48,7 | 54,5 |
| 41 | 10:30 | 49,7 | 55,8 |
| 42 | 10:45 | 45,0 | 52,7 |
| 43 | 11:00 | 45,7 | 52,8 |
| 44 | 11:15 | 49,6 | 56,7 |
| 45 | 11:30 | 46,3 | 53,9 |
| 46 | 11:45 | 51,7 | 59,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 47 | 12:00 | 45,2 | 52,6 |
| 48 | 12:15 | 50,7 | 57,7 |
| 49 | 12:30 | 46,5 | 53,5 |
| 50 | 12:45 | 45,2 | 52,1 |
| 51 | 13:00 | 47,2 | 54,5 |
| 52 | 13:15 | 49,6 | 56,1 |
| 53 | 13:30 | 51,7 | 59,7 |
| 54 | 13:45 | 49,9 | 57,2 |
| 55 | 14:00 | 47,7 | 55,3 |
| 56 | 14:15 | 49,0 | 55,7 |
| 57 | 14:30 | 50,2 | 56,7 |
| 58 | 14:45 | 48,9 | 54,6 |
| 59 | 15:00 | 49,1 | 56,2 |
| 60 | 15:15 | 52,2 | 58,9 |
| 61 | 15:30 | 52,9 | 60,1 |
| 62 | 15:45 | 50,7 | 57,6 |
| 63 | 16:00 | 49,7 | 57,5 |
| 64 | 16:15 | 52,7 | 60,9 |
| 65 | 16:30 | 50,4 | 58,3 |
| 66 | 16:45 | 49,3 | 56,7 |
| 67 | 17:00 | 52,0 | 59,9 |
| 68 | 17:15 | 50,7 | 59,2 |
| 69 | 17:30 | 49,7 | 58,0 |
| 70 | 17:45 | 49,5 | 57,4 |
| 71 | 18:00 | 50,7 | 61,3 |
| 72 | 18:15 | 47,0 | 58,2 |
| 73 | 18:30 | 42,8 | 52,1 |
| 74 | 18:45 | 46,0 | 56,6 |
| 75 | 19:00 | 45,2 | 54,9 |
| 76 | 19:15 | 42,8 | 52,4 |
| 77 | 19:30 | 46,1 | 57,5 |
| 78 | 19:45 | 45,4 | 55,6 |
| 79 | 20:00 | 43,4 | 51,9 |
| 80 | 20:15 | 42,5 | 50,9 |
| 81 | 20:30 | 43,4 | 52,4 |
| 82 | 20:45 | 37,9 | 45,4 |
| 83 | 21:00 | 37,9 | 46,4 |
| 84 | 21:15 | 38,3 | 46,3 |
| 85 | 21:30 | 42,2 | 50,1 |
| 86 | 21:45 | 41,4 | 49,3 |
| 87 | 22:00 | 40,9 | 47,8 |
| 88 | 22:15 | 41,9 | 47,8 |
| 89 | 22:30 | 39,0 | 46,6 |
| 90 | 22:45 | 42,6 | 49,1 |
| 91 | 23:00 | 42,3 | 51,4 |
| 92 | 23:15 | 42,0 | 50,6 |
| 93 | 23:30 | 42,2 | 51,4 |
| 94 | 23:45 | 38,8 | 44,7 |
| 95 | 00:00 | 41,4 | 47,3 |
| 96 | 00:15 | 38,7 | 44,7 |

**2.GÜN**
**20-21.09.2022**
**10.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,2 | 48,4 |
| 2 | 00:45 | 41,3 | 48,7 |
| 3 | 01:00 | 43,4 | 52,2 |
| 4 | 01:15 | 41,1 | 48,3 |
| 5 | 01:30 | 42,0 | 50,3 |
| 6 | 01:45 | 40,2 | 47,8 |
| 7 | 02:00 | 41,3 | 49,1 |
| 8 | 02:15 | 42,0 | 50,3 |
| 9 | 02:30 | 41,1 | 48,8 |
| 10 | 02:45 | 39,4 | 46,5 |
| 11 | 03:00 | 41,0 | 48,7 |
| 12 | 03:15 | 42,7 | 49,9 |
| 13 | 03:30 | 39,9 | 47,4 |
| 14 | 03:45 | 39,5 | 47,7 |
| 15 | 04:00 | 40,2 | 47,3 |
| 16 | 04:15 | 40,2 | 47,5 |
| 17 | 04:30 | 38,7 | 46,0 |
| 18 | 04:45 | 40,0 | 47,4 |
| 19 | 05:00 | 40,6 | 47,8 |
| 20 | 05:15 | 38,9 | 45,9 |
| 21 | 05:30 | 40,2 | 46,5 |
| 22 | 05:45 | 38,5 | 46,4 |
| 23 | 06:00 | 38,2 | 45,6 |
| 24 | 06:15 | 40,0 | 47,4 |
| 25 | 06:30 | 40,8 | 47,6 |
| 26 | 06:45 | 40,3 | 48,1 |
| 27 | 07:00 | 42,7 | 51,9 |
| 28 | 07:15 | 43,6 | 52,9 |
| 29 | 07:30 | 45,1 | 54,4 |
| 30 | 07:45 | 45,2 | 54,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 31 | 08:00 | 47,0 | 53,4 |
| 32 | 08:15 | 49,9 | 55,2 |
| 33 | 08:30 | 47,0 | 53,0 |
| 34 | 08:45 | 50,8 | 57,2 |
| 35 | 09:00 | 52,0 | 57,5 |
| 36 | 09:15 | 53,2 | 59,8 |
| 37 | 09:30 | 54,0 | 62,0 |
| 38 | 09:45 | 52,0 | 59,3 |
| 39 | 10:00 | 52,3 | 57,9 |
| 40 | 10:15 | 53,9 | 60,5 |
| 41 | 10:30 | 54,0 | 60,4 |
| 42 | 10:45 | 50,0 | 58,6 |
| 43 | 11:00 | 49,3 | 57,3 |
| 44 | 11:15 | 48,5 | 55,9 |
| 45 | 11:30 | 49,8 | 58,2 |
| 46 | 11:45 | 49,3 | 56,8 |
| 47 | 12:00 | 49,9 | 57,9 |
| 48 | 12:15 | 48,1 | 59,2 |
| 49 | 12:30 | 49,9 | 60,1 |
| 50 | 12:45 | 48,7 | 57,9 |
| 51 | 13:00 | 54,6 | 61,6 |
| 52 | 13:15 | 48,7 | 62,2 |
| 53 | 13:30 | 51,5 | 63,1 |
| 54 | 13:45 | 49,4 | 61,5 |
| 55 | 14:00 | 53,7 | 60,2 |
| 56 | 14:15 | 52,0 | 59,1 |
| 57 | 14:30 | 46,4 | 58,6 |
| 58 | 14:45 | 47,4 | 59,0 |
| 59 | 15:00 | 51,1 | 58,5 |
| 60 | 15:15 | 49,9 | 57,5 |
| 61 | 15:30 | 52,9 | 61,5 |
| 62 | 15:45 | 50,9 | 57,6 |
| 63 | 16:00 | 51,5 | 59,3 |
| 64 | 16:15 | 54,2 | 62,3 |
| 65 | 16:30 | 49,8 | 57,9 |
| 66 | 16:45 | 53,7 | 60,6 |
| 67 | 17:00 | 51,5 | 59,4 |
| 68 | 17:15 | 51,3 | 58,1 |
| 69 | 17:30 | 51,5 | 59,9 |
| 70 | 17:45 | 55,4 | 64,4 |
| 71 | 18:00 | 48,9 | 59,3 |
| 72 | 18:15 | 44,6 | 60,0 |
| 73 | 18:30 | 44,9 | 58,4 |
| 74 | 18:45 | 42,9 | 52,9 |
| 75 | 19:00 | 45,1 | 54,8 |
| 76 | 19:15 | 43,2 | 53,4 |
| 77 | 19:30 | 45,0 | 55,9 |
| 78 | 19:45 | 44,0 | 54,1 |
| 79 | 20:00 | 45,7 | 54,9 |
| 80 | 20:15 | 44,0 | 53,0 |
| 81 | 20:30 | 42,3 | 51,1 |
| 82 | 20:45 | 38,0 | 45,5 |
| 83 | 21:00 | 40,7 | 49,8 |
| 84 | 21:15 | 38,9 | 46,7 |
| 85 | 21:30 | 40,9 | 48,7 |
| 86 | 21:45 | 38,9 | 46,6 |
| 87 | 22:00 | 40,6 | 47,6 |
| 88 | 22:15 | 40,0 | 45,7 |
| 89 | 22:30 | 37,3 | 44,3 |
| 90 | 22:45 | 40,7 | 46,8 |
| 91 | 23:00 | 40,4 | 48,8 |
| 92 | 23:15 | 42,9 | 51,7 |
| 93 | 23:30 | 42,4 | 49,3 |
| 94 | 23:45 | 43,0 | 49,2 |
| 95 | 00:00 | 40,5 | 46,3 |
| 96 | 00:15 | 42,0 | 48,6 |

**2.GÜN**
**20-21.09.2022**
**11.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,0 | 50,1 |
| 2 | 00:45 | 41,4 | 48,4 |
| 3 | 01:00 | 39,0 | 46,7 |
| 4 | 01:15 | 41,6 | 47,4 |
| 5 | 01:30 | 40,0 | 47,1 |
| 6 | 01:45 | 41,7 | 50,8 |
| 7 | 02:00 | 37,6 | 44,2 |
| 8 | 02:15 | 42,9 | 52,0 |
| 9 | 02:30 | 38,7 | 45,7 |
| 10 | 02:45 | 39,0 | 45,2 |
| 11 | 03:00 | 40,2 | 48,6 |
| 12 | 03:15 | 42,7 | 49,6 |
| 13 | 03:30 | 42,8 | 53,8 |
| 14 | 03:45 | 39,5 | 48,2 |
| 15 | 04:00 | 42,5 | 52,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 16 | 04:15 | 39,0 | 48,4 |
| 17 | 04:30 | 43,7 | 51,6 |
| 18 | 04:45 | 37,9 | 47,1 |
| 19 | 05:00 | 42,5 | 52,4 |
| 20 | 05:15 | 37,4 | 45,0 |
| 21 | 05:30 | 40,0 | 50,3 |
| 22 | 05:45 | 39,0 | 47,3 |
| 23 | 06:00 | 35,9 | 44,7 |
| 24 | 06:15 | 36,6 | 44,9 |
| 25 | 06:30 | 41,6 | 50,6 |
| 26 | 06:45 | 39,8 | 48,8 |
| 27 | 07:00 | 43,4 | 53,1 |
| 28 | 07:15 | 44,2 | 53,2 |
| 29 | 07:30 | 42,7 | 53,5 |
| 30 | 07:45 | 45,9 | 53,7 |
| 31 | 08:00 | 49,2 | 55,3 |
| 32 | 08:15 | 50,2 | 58,3 |
| 33 | 08:30 | 48,7 | 57,4 |
| 34 | 08:45 | 49,4 | 59,5 |
| 35 | 09:00 | 51,6 | 59,1 |
| 36 | 09:15 | 55,0 | 60,8 |
| 37 | 09:30 | 51,7 | 59,9 |
| 38 | 09:45 | 49,4 | 55,6 |
| 39 | 10:00 | 50,9 | 57,8 |
| 40 | 10:15 | 50,7 | 58,5 |
| 41 | 10:30 | 53,3 | 59,4 |
| 42 | 10:45 | 49,1 | 54,1 |
| 43 | 11:00 | 47,2 | 54,2 |
| 44 | 11:15 | 50,2 | 58,2 |
| 45 | 11:30 | 47,8 | 55,7 |
| 46 | 11:45 | 51,5 | 59,7 |
| 47 | 12:00 | 45,6 | 60,8 |
| 48 | 12:15 | 49,9 | 58,1 |
| 49 | 12:30 | 46,7 | 59,5 |
| 50 | 12:45 | 48,8 | 60,7 |
| 51 | 13:00 | 50,3 | 58,6 |
| 52 | 13:15 | 52,8 | 59,0 |
| 53 | 13:30 | 55,7 | 60,4 |
| 54 | 13:45 | 52,3 | 58,0 |
| 55 | 14:00 | 50,1 | 56,2 |
| 56 | 14:15 | 52,9 | 60,0 |
| 57 | 14:30 | 52,3 | 57,7 |
| 58 | 14:45 | 48,1 | 59,2 |
| 59 | 15:00 | 54,5 | 61,8 |
| 60 | 15:15 | 53,4 | 59,4 |
| 61 | 15:30 | 53,1 | 60,4 |
| 62 | 15:45 | 49,3 | 58,4 |
| 63 | 16:00 | 50,0 | 56,4 |
| 64 | 16:15 | 54,2 | 57,8 |
| 65 | 16:30 | 50,3 | 55,8 |
| 66 | 16:45 | 47,0 | 52,8 |
| 67 | 17:00 | 50,1 | 57,4 |
| 68 | 17:15 | 47,6 | 53,8 |
| 69 | 17:30 | 52,3 | 59,7 |
| 70 | 17:45 | 51,1 | 57,8 |
| 71 | 18:00 | 51,7 | 61,5 |
| 72 | 18:15 | 52,8 | 63,3 |
| 73 | 18:30 | 48,5 | 57,1 |
| 74 | 18:45 | 47,3 | 55,7 |
| 75 | 19:00 | 46,0 | 55,3 |
| 76 | 19:15 | 44,7 | 52,4 |
| 77 | 19:30 | 49,1 | 55,5 |
| 78 | 19:45 | 48,7 | 56,9 |
| 79 | 20:00 | 45,2 | 51,5 |
| 80 | 20:15 | 43,5 | 51,5 |
| 81 | 20:30 | 44,8 | 54,2 |
| 82 | 20:45 | 40,6 | 47,0 |
| 83 | 21:00 | 40,5 | 48,0 |
| 84 | 21:15 | 39,6 | 47,0 |
| 85 | 21:30 | 45,4 | 52,2 |
| 86 | 21:45 | 44,7 | 53,4 |
| 87 | 22:00 | 42,4 | 50,7 |
| 88 | 22:15 | 43,4 | 51,6 |
| 89 | 22:30 | 42,4 | 50,6 |
| 90 | 22:45 | 45,5 | 53,3 |
| 91 | 23:00 | 42,9 | 50,2 |
| 92 | 23:15 | 43,6 | 51,9 |
| 93 | 23:30 | 43,3 | 52,2 |
| 94 | 23:45 | 38,5 | 46,8 |
| 95 | 00:00 | 41,4 | 49,6 |
| 96 | 00:15 | 41,0 | 48,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**2.GÜN**
**20-21.09.2022**
**12.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,6 | 58,7 |
| 2 | 00:45 | 40,8 | 58,5 |
| 3 | 01:00 | 41,4 | 58,2 |
| 4 | 01:15 | 42,8 | 64,0 |
| 5 | 01:30 | 42,6 | 62,4 |
| 6 | 01:45 | 42,7 | 63,4 |
| 7 | 02:00 | 43,0 | 65,2 |
| 8 | 02:15 | 42,9 | 62,6 |
| 9 | 02:30 | 39,8 | 61,6 |
| 10 | 02:45 | 40,2 | 60,5 |
| 11 | 03:00 | 40,8 | 60,3 |
| 12 | 03:15 | 39,7 | 62,0 |
| 13 | 03:30 | 40,1 | 60,7 |
| 14 | 03:45 | 38,9 | 61,0 |
| 15 | 04:00 | 39,0 | 62,4 |
| 16 | 04:15 | 39,6 | 61,4 |
| 17 | 04:30 | 38,7 | 58,1 |
| 18 | 04:45 | 40,6 | 63,4 |
| 19 | 05:00 | 41,4 | 62,5 |
| 20 | 05:15 | 40,9 | 61,8 |
| 21 | 05:30 | 41,1 | 64,4 |
| 22 | 05:45 | 41,7 | 61,0 |
| 23 | 06:00 | 38,9 | 60,1 |
| 24 | 06:15 | 39,1 | 57,9 |
| 25 | 06:30 | 39,5 | 58,8 |
| 26 | 06:45 | 39,1 | 58,0 |
| 27 | 07:00 | 43,8 | 62,3 |
| 28 | 07:15 | 45,1 | 64,1 |
| 29 | 07:30 | 44,8 | 62,5 |
| 30 | 07:45 | 45,9 | 63,5 |
| 31 | 08:00 | 45,2 | 65,3 |
| 32 | 08:15 | 47,7 | 66,1 |
| 33 | 08:30 | 48,1 | 68,5 |
| 34 | 08:45 | 52,8 | 67,1 |
| 35 | 09:00 | 53,3 | 67,8 |
| 36 | 09:15 | 53,7 | 66,2 |
| 37 | 09:30 | 53,8 | 68,4 |
| 38 | 09:45 | 53,9 | 67,6 |
| 39 | 10:00 | 51,4 | 66,8 |
| 40 | 10:15 | 52,2 | 69,0 |
| 41 | 10:30 | 51,4 | 68,0 |
| 42 | 10:45 | 52,2 | 70,0 |
| 43 | 11:00 | 52,1 | 68,4 |
| 44 | 11:15 | 51,4 | 66,1 |
| 45 | 11:30 | 52,5 | 67,6 |
| 46 | 11:45 | 53,6 | 69,0 |
| 47 | 12:00 | 51,0 | 65,4 |
| 48 | 12:15 | 49,9 | 69,1 |
| 49 | 12:30 | 51,2 | 66,6 |
| 50 | 12:45 | 53,8 | 68,0 |
| 51 | 13:00 | 55,0 | 67,1 |
| 52 | 13:15 | 56,4 | 71,3 |
| 53 | 13:30 | 54,0 | 69,5 |
| 54 | 13:45 | 53,8 | 67,0 |
| 55 | 14:00 | 53,2 | 70,2 |
| 56 | 14:15 | 53,6 | 67,9 |
| 57 | 14:30 | 53,7 | 69,5 |
| 58 | 14:45 | 53,2 | 69,8 |
| 59 | 15:00 | 55,2 | 67,7 |
| 60 | 15:15 | 54,4 | 69,7 |
| 61 | 15:30 | 55,2 | 69,2 |
| 62 | 15:45 | 53,7 | 69,0 |
| 63 | 16:00 | 55,0 | 68,6 |
| 64 | 16:15 | 53,4 | 69,5 |
| 65 | 16:30 | 52,1 | 67,8 |
| 66 | 16:45 | 52,8 | 67,4 |
| 67 | 17:00 | 53,0 | 69,5 |
| 68 | 17:15 | 53,6 | 68,5 |
| 69 | 17:30 | 53,9 | 70,6 |
| 70 | 17:45 | 53,0 | 69,0 |
| 71 | 18:00 | 52,6 | 70,4 |
| 72 | 18:15 | 47,7 | 70,9 |
| 73 | 18:30 | 46,4 | 71,5 |
| 74 | 18:45 | 43,2 | 67,2 |
| 75 | 19:00 | 44,5 | 68,2 |
| 76 | 19:15 | 40,3 | 64,3 |
| 77 | 19:30 | 40,6 | 64,3 |
| 78 | 19:45 | 42,9 | 68,2 |
| 79 | 20:00 | 42,3 | 68,8 |
| 80 | 20:15 | 41,7 | 66,7 |
| 81 | 20:30 | 41,6 | 67,7 |
| 82 | 20:45 | 42,1 | 68,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 41,5 | 67,0 |
| 84 | 21:15 | 40,9 | 63,7 |
| 85 | 21:30 | 39,8 | 64,4 |
| 86 | 21:45 | 42,1 | 64,2 |
| 87 | 22:00 | 41,2 | 63,0 |
| 88 | 22:15 | 42,3 | 67,0 |
| 89 | 22:30 | 43,0 | 67,7 |
| 90 | 22:45 | 41,5 | 63,0 |
| 91 | 23:00 | 44,4 | 61,1 |
| 92 | 23:15 | 47,7 | 67,1 |
| 93 | 23:30 | 45,1 | 65,9 |
| 94 | 23:45 | 44,1 | 64,8 |
| 95 | 00:00 | 43,8 | 67,4 |
| 96 | 00:15 | 42,6 | 66,7 |

**2.GÜN**
**20-21.09.2022**
**13.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,1 | 50,3 |
| 2 | 00:45 | 41,7 | 48,5 |
| 3 | 01:00 | 43,3 | 49,1 |
| 4 | 01:15 | 41,3 | 49,5 |
| 5 | 01:30 | 45,2 | 52,8 |
| 6 | 01:45 | 42,3 | 51,5 |
| 7 | 02:00 | 43,3 | 49,1 |
| 8 | 02:15 | 44,9 | 52,7 |
| 9 | 02:30 | 44,8 | 49,4 |
| 10 | 02:45 | 41,7 | 47,2 |
| 11 | 03:00 | 42,6 | 50,0 |
| 12 | 03:15 | 44,7 | 50,5 |
| 13 | 03:30 | 39,4 | 49,7 |
| 14 | 03:45 | 39,7 | 45,3 |
| 15 | 04:00 | 40,1 | 47,5 |
| 16 | 04:15 | 38,7 | 45,8 |
| 17 | 04:30 | 43,9 | 49,0 |
| 18 | 04:45 | 42,7 | 48,9 |
| 19 | 05:00 | 42,6 | 51,8 |
| 20 | 05:15 | 42,3 | 50,9 |
| 21 | 05:30 | 40,4 | 46,6 |
| 22 | 05:45 | 39,2 | 47,1 |
| 23 | 06:00 | 39,3 | 50,6 |
| 24 | 06:15 | 38,2 | 56,1 |
| 25 | 06:30 | 40,6 | 55,7 |
| 26 | 06:45 | 39,3 | 53,4 |
| 27 | 07:00 | 38,8 | 56,0 |
| 28 | 07:15 | 42,0 | 56,9 |
| 29 | 07:30 | 41,3 | 55,6 |
| 30 | 07:45 | 43,4 | 56,0 |
| 31 | 08:00 | 44,7 | 55,1 |
| 32 | 08:15 | 49,8 | 56,4 |
| 33 | 08:30 | 47,6 | 59,8 |
| 34 | 08:45 | 46,5 | 59,3 |
| 35 | 09:00 | 48,7 | 58,7 |
| 36 | 09:15 | 47,1 | 59,1 |
| 37 | 09:30 | 46,7 | 56,0 |
| 38 | 09:45 | 43,9 | 51,5 |
| 39 | 10:00 | 42,7 | 50,5 |
| 40 | 10:15 | 45,0 | 53,3 |
| 41 | 10:30 | 45,1 | 52,7 |
| 42 | 10:45 | 43,4 | 49,0 |
| 43 | 11:00 | 45,5 | 53,7 |
| 44 | 11:15 | 44,2 | 49,8 |
| 45 | 11:30 | 45,4 | 54,4 |
| 46 | 11:45 | 42,1 | 48,2 |
| 47 | 12:00 | 43,7 | 50,4 |
| 48 | 12:15 | 42,9 | 47,4 |
| 49 | 12:30 | 44,4 | 50,2 |
| 50 | 12:45 | 42,0 | 51,6 |
| 51 | 13:00 | 45,0 | 53,9 |
| 52 | 13:15 | 44,2 | 52,5 |
| 53 | 13:30 | 46,3 | 50,2 |
| 54 | 13:45 | 43,5 | 51,7 |
| 55 | 14:00 | 46,1 | 55,1 |
| 56 | 14:15 | 47,3 | 50,9 |
| 57 | 14:30 | 46,1 | 55,1 |
| 58 | 14:45 | 43,0 | 52,7 |
| 59 | 15:00 | 45,0 | 50,8 |
| 60 | 15:15 | 43,6 | 52,2 |
| 61 | 15:30 | 43,9 | 49,3 |
| 62 | 15:45 | 40,6 | 46,2 |
| 63 | 16:00 | 43,0 | 46,9 |
| 64 | 16:15 | 44,8 | 49,5 |
| 65 | 16:30 | 40,5 | 49,5 |
| 66 | 16:45 | 43,5 | 48,3 |
| 67 | 17:00 | 41,1 | 48,4 |
| 68 | 17:15 | 43,8 | 48,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 69 | 17:30 | 44,8 | 50,3 |
| 70 | 17:45 | 46,9 | 53,7 |
| 71 | 18:00 | 41,1 | 56,3 |
| 72 | 18:15 | 43,2 | 57,0 |
| 73 | 18:30 | 42,5 | 56,1 |
| 74 | 18:45 | 40,0 | 55,7 |
| 75 | 19:00 | 40,9 | 54,3 |
| 76 | 19:15 | 42,7 | 55,3 |
| 77 | 19:30 | 44,0 | 53,4 |
| 78 | 19:45 | 46,5 | 54,3 |
| 79 | 20:00 | 43,5 | 51,6 |
| 80 | 20:15 | 41,3 | 52,7 |
| 81 | 20:30 | 40,3 | 50,3 |
| 82 | 20:45 | 38,4 | 52,7 |
| 83 | 21:00 | 43,2 | 53,0 |
| 84 | 21:15 | 40,3 | 52,4 |
| 85 | 21:30 | 43,0 | 52,5 |
| 86 | 21:45 | 40,0 | 53,9 |
| 87 | 22:00 | 40,3 | 52,7 |
| 88 | 22:15 | 40,3 | 55,1 |
| 89 | 22:30 | 42,6 | 53,8 |
| 90 | 22:45 | 43,7 | 56,6 |
| 91 | 23:00 | 42,9 | 56,7 |
| 92 | 23:15 | 44,3 | 55,1 |
| 93 | 23:30 | 42,6 | 53,9 |
| 94 | 23:45 | 43,0 | 53,1 |
| 95 | 00:00 | 44,1 | 51,7 |
| 96 | 00:15 | 44,9 | 53,9 |

**2.GÜN**
**20-21.09.2022**
**14.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,0 | 51,0 |
| 2 | 00:45 | 34,5 | 51,8 |
| 3 | 01:00 | 36,6 | 53,5 |
| 4 | 01:15 | 37,8 | 53,8 |
| 5 | 01:30 | 38,4 | 55,4 |
| 6 | 01:45 | 38,4 | 55,3 |
| 7 | 02:00 | 38,8 | 55,9 |
| 8 | 02:15 | 38,7 | 54,1 |
| 9 | 02:30 | 35,8 | 51,8 |
| 10 | 02:45 | 40,0 | 55,9 |
| 11 | 03:00 | 39,7 | 57,5 |
| 12 | 03:15 | 40,6 | 59,0 |
| 13 | 03:30 | 39,0 | 57,8 |
| 14 | 03:45 | 37,0 | 57,9 |
| 15 | 04:00 | 39,9 | 59,3 |
| 16 | 04:15 | 40,5 | 58,5 |
| 17 | 04:30 | 36,1 | 51,4 |
| 18 | 04:45 | 40,7 | 56,2 |
| 19 | 05:00 | 36,7 | 55,2 |
| 20 | 05:15 | 36,2 | 54,7 |
| 21 | 05:30 | 36,5 | 57,2 |
| 22 | 05:45 | 40,3 | 51,4 |
| 23 | 06:00 | 40,4 | 54,3 |
| 24 | 06:15 | 39,9 | 50,7 |
| 25 | 06:30 | 42,9 | 56,7 |
| 26 | 06:45 | 40,7 | 51,3 |
| 27 | 07:00 | 41,1 | 54,2 |
| 28 | 07:15 | 44,5 | 55,2 |
| 29 | 07:30 | 43,8 | 55,6 |
| 30 | 07:45 | 45,2 | 53,9 |
| 31 | 08:00 | 48,1 | 50,6 |
| 32 | 08:15 | 46,8 | 52,9 |
| 33 | 08:30 | 47,1 | 50,5 |
| 34 | 08:45 | 47,5 | 52,6 |
| 35 | 09:00 | 47,8 | 53,7 |
| 36 | 09:15 | 48,1 | 55,6 |
| 37 | 09:30 | 48,5 | 57,0 |
| 38 | 09:45 | 49,0 | 53,7 |
| 39 | 10:00 | 50,2 | 56,3 |
| 40 | 10:15 | 49,9 | 52,8 |
| 41 | 10:30 | 50,5 | 55,9 |
| 42 | 10:45 | 51,1 | 53,5 |
| 43 | 11:00 | 50,7 | 55,8 |
| 44 | 11:15 | 50,4 | 56,4 |
| 45 | 11:30 | 49,9 | 58,0 |
| 46 | 11:45 | 51,1 | 54,8 |
| 47 | 12:00 | 50,7 | 52,9 |
| 48 | 12:15 | 47,7 | 54,9 |
| 49 | 12:30 | 47,9 | 56,4 |
| 50 | 12:45 | 48,1 | 57,0 |
| 51 | 13:00 | 47,5 | 58,6 |
| 52 | 13:15 | 50,7 | 55,8 |
| 53 | 13:30 | 50,5 | 54,3 |
| 54 | 13:45 | 50,0 | 56,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 55 | 14:00 | 50,3 | 53,4 |
| 56 | 14:15 | 49,5 | 55,9 |
| 57 | 14:30 | 48,2 | 52,9 |
| 58 | 14:45 | 48,5 | 54,3 |
| 59 | 15:00 | 49,0 | 56,4 |
| 60 | 15:15 | 49,0 | 55,8 |
| 61 | 15:30 | 49,1 | 53,0 |
| 62 | 15:45 | 48,9 | 51,8 |
| 63 | 16:00 | 49,3 | 55,8 |
| 64 | 16:15 | 49,0 | 53,5 |
| 65 | 16:30 | 49,0 | 54,8 |
| 66 | 16:45 | 49,4 | 54,0 |
| 67 | 17:00 | 50,0 | 54,8 |
| 68 | 17:15 | 49,7 | 52,4 |
| 69 | 17:30 | 48,5 | 54,9 |
| 70 | 17:45 | 48,9 | 56,3 |
| 71 | 18:00 | 49,1 | 57,1 |
| 72 | 18:15 | 49,0 | 56,8 |
| 73 | 18:30 | 49,2 | 58,5 |
| 74 | 18:45 | 50,2 | 60,8 |
| 75 | 19:00 | 49,7 | 58,7 |
| 76 | 19:15 | 49,4 | 54,1 |
| 77 | 19:30 | 49,8 | 59,9 |
| 78 | 19:45 | 49,7 | 58,5 |
| 79 | 20:00 | 47,7 | 56,3 |
| 80 | 20:15 | 48,8 | 57,7 |
| 81 | 20:30 | 49,3 | 59,3 |
| 82 | 20:45 | 49,4 | 55,8 |
| 83 | 21:00 | 48,1 | 59,1 |
| 84 | 21:15 | 50,8 | 56,7 |
| 85 | 21:30 | 49,7 | 58,4 |
| 86 | 21:45 | 46,3 | 56,3 |
| 87 | 22:00 | 42,6 | 52,0 |
| 88 | 22:15 | 45,0 | 52,7 |
| 89 | 22:30 | 42,8 | 54,3 |
| 90 | 22:45 | 41,8 | 57,3 |
| 91 | 23:00 | 42,4 | 55,1 |
| 92 | 23:15 | 42,3 | 53,3 |
| 93 | 23:30 | 39,7 | 56,2 |
| 94 | 23:45 | 43,7 | 53,3 |
| 95 | 00:00 | 43,1 | 56,5 |
| 96 | 00:15 | 45,0 | 53,7 |

**2.GÜN**
**20-21.09.2022**

**15.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 43,1 | 53,3 |
| 2 | 00:45 | 43,4 | 55,9 |
| 3 | 01:00 | 44,9 | 58,5 |
| 4 | 01:15 | 42,6 | 52,4 |
| 5 | 01:30 | 44,6 | 58,0 |
| 6 | 01:45 | 42,3 | 53,7 |
| 7 | 02:00 | 42,2 | 54,9 |
| 8 | 02:15 | 44,3 | 59,3 |
| 9 | 02:30 | 42,5 | 53,5 |
| 10 | 02:45 | 41,5 | 54,2 |
| 11 | 03:00 | 42,2 | 55,9 |
| 12 | 03:15 | 42,8 | 54,2 |
| 13 | 03:30 | 39,5 | 52,1 |
| 14 | 03:45 | 38,8 | 53,0 |
| 15 | 04:00 | 39,1 | 51,5 |
| 16 | 04:15 | 38,2 | 52,0 |
| 17 | 04:30 | 39,9 | 53,4 |
| 18 | 04:45 | 39,6 | 55,1 |
| 19 | 05:00 | 40,7 | 53,0 |
| 20 | 05:15 | 41,0 | 53,6 |
| 21 | 05:30 | 38,9 | 50,3 |
| 22 | 05:45 | 37,6 | 48,1 |
| 23 | 06:00 | 37,4 | 49,3 |
| 24 | 06:15 | 40,8 | 52,0 |
| 25 | 06:30 | 42,2 | 54,1 |
| 26 | 06:45 | 41,9 | 55,7 |
| 27 | 07:00 | 41,5 | 54,0 |
| 28 | 07:15 | 44,2 | 57,4 |
| 29 | 07:30 | 44,0 | 59,0 |
| 30 | 07:45 | 40,2 | 53,6 |
| 31 | 08:00 | 41,7 | 53,8 |
| 32 | 08:15 | 44,8 | 58,7 |
| 33 | 08:30 | 45,2 | 60,0 |
| 34 | 08:45 | 51,4 | 64,9 |
| 35 | 09:00 | 53,6 | 68,0 |
| 36 | 09:15 | 50,4 | 70,9 |
| 37 | 09:30 | 53,0 | 68,0 |
| 38 | 09:45 | 52,5 | 67,8 |
| 39 | 10:00 | 54,0 | 64,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 40 | 10:15 | 51,6 | 65,1 |
| 41 | 10:30 | 52,7 | 63,9 |
| 42 | 10:45 | 53,4 | 67,1 |
| 43 | 11:00 | 50,9 | 63,9 |
| 44 | 11:15 | 54,0 | 67,9 |
| 45 | 11:30 | 52,5 | 64,5 |
| 46 | 11:45 | 50,4 | 70,6 |
| 47 | 12:00 | 50,9 | 62,5 |
| 48 | 12:15 | 53,3 | 67,5 |
| 49 | 12:30 | 52,7 | 65,3 |
| 50 | 12:45 | 51,0 | 69,8 |
| 51 | 13:00 | 52,1 | 69,6 |
| 52 | 13:15 | 52,9 | 75,0 |
| 53 | 13:30 | 51,0 | 68,3 |
| 54 | 13:45 | 51,9 | 69,2 |
| 55 | 14:00 | 50,6 | 66,9 |
| 56 | 14:15 | 53,9 | 68,6 |
| 57 | 14:30 | 51,6 | 67,3 |
| 58 | 14:45 | 54,2 | 66,3 |
| 59 | 15:00 | 50,7 | 72,0 |
| 60 | 15:15 | 52,5 | 68,3 |
| 61 | 15:30 | 52,0 | 71,2 |
| 62 | 15:45 | 53,9 | 70,6 |
| 63 | 16:00 | 52,5 | 72,3 |
| 64 | 16:15 | 52,0 | 70,6 |
| 65 | 16:30 | 52,3 | 67,5 |
| 66 | 16:45 | 53,4 | 66,3 |
| 67 | 17:00 | 51,1 | 69,9 |
| 68 | 17:15 | 53,4 | 64,5 |
| 69 | 17:30 | 52,9 | 69,8 |
| 70 | 17:45 | 54,6 | 68,2 |
| 71 | 18:00 | 53,0 | 69,8 |
| 72 | 18:15 | 53,5 | 63,9 |
| 73 | 18:30 | 53,0 | 62,4 |
| 74 | 18:45 | 51,9 | 58,5 |
| 75 | 19:00 | 50,7 | 61,7 |
| 76 | 19:15 | 50,0 | 63,8 |
| 77 | 19:30 | 47,8 | 60,8 |
| 78 | 19:45 | 42,3 | 60,1 |
| 79 | 20:00 | 40,8 | 63,0 |
| 80 | 20:15 | 43,0 | 63,8 |
| 81 | 20:30 | 41,2 | 61,1 |
| 82 | 20:45 | 37,0 | 59,8 |
| 83 | 21:00 | 38,1 | 55,7 |
| 84 | 21:15 | 38,4 | 50,6 |
| 85 | 21:30 | 35,7 | 49,5 |
| 86 | 21:45 | 36,6 | 51,9 |
| 87 | 22:00 | 35,9 | 52,7 |
| 88 | 22:15 | 36,8 | 54,5 |
| 89 | 22:30 | 38,0 | 54,8 |
| 90 | 22:45 | 36,2 | 50,9 |
| 91 | 23:00 | 39,1 | 54,9 |
| 92 | 23:15 | 40,5 | 61,2 |
| 93 | 23:30 | 39,8 | 58,9 |
| 94 | 23:45 | 37,0 | 57,2 |
| 95 | 00:00 | 39,5 | 58,7 |
| 96 | 00:15 | 37,4 | 55,2 |

**2.GÜN**
**20-21.09.2022**
**16.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,7 | 54,6 |
| 2 | 00:45 | 41,6 | 57,4 |
| 3 | 01:00 | 42,2 | 60,0 |
| 4 | 01:15 | 40,0 | 53,7 |
| 5 | 01:30 | 42,8 | 59,5 |
| 6 | 01:45 | 39,7 | 55,1 |
| 7 | 02:00 | 40,0 | 56,3 |
| 8 | 02:15 | 42,5 | 60,8 |
| 9 | 02:30 | 42,4 | 54,9 |
| 10 | 02:45 | 39,7 | 55,6 |
| 11 | 03:00 | 40,4 | 57,4 |
| 12 | 03:15 | 42,3 | 55,6 |
| 13 | 03:30 | 37,9 | 53,4 |
| 14 | 03:45 | 37,6 | 54,3 |
| 15 | 04:00 | 37,5 | 53,9 |
| 16 | 04:15 | 36,2 | 54,5 |
| 17 | 04:30 | 39,9 | 56,0 |
| 18 | 04:45 | 39,6 | 57,8 |
| 19 | 05:00 | 40,8 | 55,5 |
| 20 | 05:15 | 41,1 | 56,2 |
| 21 | 05:30 | 39,0 | 52,7 |
| 22 | 05:45 | 37,5 | 50,5 |
| 23 | 06:00 | 37,7 | 51,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 24 | 06:15 | 39,1 | 54,5 |
| 25 | 06:30 | 42,1 | 56,7 |
| 26 | 06:45 | 40,1 | 58,4 |
| 27 | 07:00 | 39,7 | 56,6 |
| 28 | 07:15 | 44,1 | 60,2 |
| 29 | 07:30 | 43,9 | 60,5 |
| 30 | 07:45 | 45,7 | 59,2 |
| 31 | 08:00 | 45,9 | 61,5 |
| 32 | 08:15 | 51,6 | 61,1 |
| 33 | 08:30 | 50,7 | 64,4 |
| 34 | 08:45 | 50,9 | 66,0 |
| 35 | 09:00 | 52,6 | 62,8 |
| 36 | 09:15 | 49,6 | 58,2 |
| 37 | 09:30 | 50,2 | 61,3 |
| 38 | 09:45 | 47,7 | 59,2 |
| 39 | 10:00 | 48,1 | 59,2 |
| 40 | 10:15 | 49,8 | 58,7 |
| 41 | 10:30 | 50,4 | 60,6 |
| 42 | 10:45 | 48,9 | 59,3 |
| 43 | 11:00 | 51,2 | 62,7 |
| 44 | 11:15 | 48,3 | 58,3 |
| 45 | 11:30 | 48,8 | 60,2 |
| 46 | 11:45 | 46,7 | 57,0 |
| 47 | 12:00 | 48,5 | 57,9 |
| 48 | 12:15 | 47,2 | 59,2 |
| 49 | 12:30 | 50,0 | 58,9 |
| 50 | 12:45 | 50,4 | 59,3 |
| 51 | 13:00 | 53,4 | 61,8 |
| 52 | 13:15 | 47,8 | 61,2 |
| 53 | 13:30 | 49,6 | 62,9 |
| 54 | 13:45 | 47,5 | 63,8 |
| 55 | 14:00 | 50,2 | 66,4 |
| 56 | 14:15 | 49,3 | 63,0 |
| 57 | 14:30 | 51,4 | 65,0 |
| 58 | 14:45 | 47,2 | 61,9 |
| 59 | 15:00 | 49,3 | 61,4 |
| 60 | 15:15 | 46,4 | 59,6 |
| 61 | 15:30 | 47,7 | 54,6 |
| 62 | 15:45 | 44,2 | 54,8 |
| 63 | 16:00 | 47,0 | 56,8 |
| 64 | 16:15 | 48,1 | 59,5 |
| 65 | 16:30 | 45,0 | 55,2 |
| 66 | 16:45 | 47,6 | 54,1 |
| 67 | 17:00 | 45,7 | 54,8 |
| 68 | 17:15 | 46,7 | 58,9 |
| 69 | 17:30 | 48,4 | 60,8 |
| 70 | 17:45 | 49,7 | 60,0 |
| 71 | 18:00 | 42,7 | 63,5 |
| 72 | 18:15 | 46,4 | 67,6 |
| 73 | 18:30 | 47,2 | 64,4 |
| 74 | 18:45 | 45,6 | 61,9 |
| 75 | 19:00 | 47,8 | 63,4 |
| 76 | 19:15 | 46,6 | 61,5 |
| 77 | 19:30 | 47,8 | 63,0 |
| 78 | 19:45 | 49,1 | 63,6 |
| 79 | 20:00 | 46,9 | 59,4 |
| 80 | 20:15 | 45,1 | 62,2 |
| 81 | 20:30 | 43,8 | 55,6 |
| 82 | 20:45 | 40,9 | 54,1 |
| 83 | 21:00 | 45,2 | 59,9 |
| 84 | 21:15 | 41,4 | 57,1 |
| 85 | 21:30 | 43,6 | 58,7 |
| 86 | 21:45 | 40,8 | 59,4 |
| 87 | 22:00 | 41,1 | 55,2 |
| 88 | 22:15 | 40,7 | 58,0 |
| 89 | 22:30 | 42,5 | 60,6 |
| 90 | 22:45 | 44,9 | 62,3 |
| 91 | 23:00 | 43,0 | 57,7 |
| 92 | 23:15 | 43,8 | 60,4 |
| 93 | 23:30 | 43,0 | 59,2 |
| 94 | 23:45 | 44,0 | 60,6 |
| 95 | 00:00 | 41,7 | 55,8 |
| 96 | 00:15 | 43,3 | 57,9 |

**2.GÜN**
**20-21.09.2022**
**17.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,7 | 56,4 |
| 2 | 00:45 | 45,1 | 59,3 |
| 3 | 01:00 | 46,8 | 62,1 |
| 4 | 01:15 | 44,3 | 55,5 |
| 5 | 01:30 | 46,6 | 61,5 |
| 6 | 01:45 | 44,4 | 57,6 |
| 7 | 02:00 | 44,3 | 58,9 |
| 8 | 02:15 | 46,6 | 63,5 |
| 9 | 02:30 | 45,0 | 57,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 10 | 02:45 | 43,6 | 58,1 |
| 11 | 03:00 | 44,3 | 59,9 |
| 12 | 03:15 | 46,6 | 59,8 |
| 13 | 03:30 | 42,7 | 57,8 |
| 14 | 03:45 | 42,0 | 58,5 |
| 15 | 04:00 | 42,1 | 57,0 |
| 16 | 04:15 | 41,3 | 57,2 |
| 17 | 04:30 | 41,5 | 56,5 |
| 18 | 04:45 | 41,3 | 58,6 |
| 19 | 05:00 | 43,2 | 57,4 |
| 20 | 05:15 | 43,6 | 58,0 |
| 21 | 05:30 | 42,9 | 56,6 |
| 22 | 05:45 | 41,5 | 54,3 |
| 23 | 06:00 | 41,3 | 55,6 |
| 24 | 06:15 | 45,0 | 58,7 |
| 25 | 06:30 | 45,2 | 59,1 |
| 26 | 06:45 | 44,9 | 60,6 |
| 27 | 07:00 | 44,4 | 59,0 |
| 28 | 07:15 | 47,3 | 63,0 |
| 29 | 07:30 | 49,1 | 67,0 |
| 30 | 07:45 | 48,0 | 64,8 |
| 31 | 08:00 | 48,8 | 67,4 |
| 32 | 08:15 | 51,0 | 63,5 |
| 33 | 08:30 | 50,7 | 67,1 |
| 34 | 08:45 | 52,0 | 68,7 |
| 35 | 09:00 | 52,7 | 65,3 |
| 36 | 09:15 | 54,5 | 63,4 |
| 37 | 09:30 | 52,8 | 67,1 |
| 38 | 09:45 | 51,1 | 64,7 |
| 39 | 10:00 | 50,3 | 64,7 |
| 40 | 10:15 | 52,7 | 64,2 |
| 41 | 10:30 | 53,3 | 66,4 |
| 42 | 10:45 | 51,0 | 64,8 |
| 43 | 11:00 | 52,5 | 68,7 |
| 44 | 11:15 | 52,2 | 63,6 |
| 45 | 11:30 | 51,3 | 65,7 |
| 46 | 11:45 | 52,5 | 62,9 |
| 47 | 12:00 | 49,8 | 64,0 |
| 48 | 12:15 | 54,1 | 65,3 |
| 49 | 12:30 | 52,8 | 63,2 |
| 50 | 12:45 | 54,0 | 62,9 |
| 51 | 13:00 | 52,4 | 65,3 |
| 52 | 13:15 | 52,3 | 64,9 |
| 53 | 13:30 | 52,8 | 66,7 |
| 54 | 13:45 | 51,4 | 67,6 |
| 55 | 14:00 | 50,0 | 70,3 |
| 56 | 14:15 | 51,3 | 66,8 |
| 57 | 14:30 | 52,8 | 68,8 |
| 58 | 14:45 | 51,4 | 68,3 |
| 59 | 15:00 | 49,0 | 65,3 |
| 60 | 15:15 | 49,8 | 63,0 |
| 61 | 15:30 | 51,1 | 64,4 |
| 62 | 15:45 | 47,4 | 62,8 |
| 63 | 16:00 | 49,1 | 61,5 |
| 64 | 16:15 | 50,0 | 61,2 |
| 65 | 16:30 | 48,8 | 62,4 |
| 66 | 16:45 | 47,1 | 63,5 |
| 67 | 17:00 | 47,0 | 63,3 |
| 68 | 17:15 | 49,9 | 62,4 |
| 69 | 17:30 | 51,4 | 64,5 |
| 70 | 17:45 | 52,9 | 63,7 |
| 71 | 18:00 | 48,5 | 67,4 |
| 72 | 18:15 | 51,6 | 69,0 |
| 73 | 18:30 | 49,9 | 65,4 |
| 74 | 18:45 | 50,8 | 65,4 |
| 75 | 19:00 | 52,0 | 67,3 |
| 76 | 19:15 | 50,0 | 67,4 |
| 77 | 19:30 | 51,1 | 69,0 |
| 78 | 19:45 | 51,6 | 66,6 |
| 79 | 20:00 | 50,0 | 67,1 |
| 80 | 20:15 | 50,1 | 70,3 |
| 81 | 20:30 | 46,5 | 62,5 |
| 82 | 20:45 | 47,6 | 61,2 |
| 83 | 21:00 | 49,9 | 67,6 |
| 84 | 21:15 | 47,7 | 64,6 |
| 85 | 21:30 | 47,0 | 64,5 |
| 86 | 21:45 | 46,2 | 64,9 |
| 87 | 22:00 | 44,4 | 60,2 |
| 88 | 22:15 | 45,7 | 63,5 |
| 89 | 22:30 | 44,0 | 61,5 |
| 90 | 22:45 | 46,2 | 62,7 |
| 91 | 23:00 | 44,5 | 58,3 |
| 92 | 23:15 | 43,5 | 61,1 |
| 93 | 23:30 | 41,5 | 59,6 |
| 94 | 23:45 | 40,8 | 61,3 |
| 95 | 00:00 | 40,3 | 56,5 |
| 96 | 00:15 | 44,7 | 59,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

**2.GÜN**
**23-24.09.2022**
**18.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,5 | 50,6 |
| 2 | 00:45 | 40,4 | 48,5 |
| 3 | 01:00 | 40,3 | 49,3 |
| 4 | 01:15 | 40,0 | 47,9 |
| 5 | 01:30 | 42,8 | 51,6 |
| 6 | 01:45 | 42,6 | 50,5 |
| 7 | 02:00 | 40,1 | 49,3 |
| 8 | 02:15 | 43,0 | 50,7 |
| 9 | 02:30 | 41,1 | 47,7 |
| 10 | 02:45 | 39,6 | 48,8 |
| 11 | 03:00 | 39,1 | 48,2 |
| 12 | 03:15 | 40,7 | 47,0 |
| 13 | 03:30 | 41,5 | 52,0 |
| 14 | 03:45 | 42,1 | 50,3 |
| 15 | 04:00 | 41,6 | 51,4 |
| 16 | 04:15 | 42,2 | 52,8 |
| 17 | 04:30 | 42,7 | 53,5 |
| 18 | 04:45 | 40,7 | 48,8 |
| 19 | 05:00 | 42,0 | 51,2 |
| 20 | 05:15 | 40,0 | 49,2 |
| 21 | 05:30 | 39,6 | 49,1 |
| 22 | 05:45 | 39,5 | 49,5 |
| 23 | 06:00 | 38,1 | 45,8 |
| 24 | 06:15 | 38,5 | 46,3 |
| 25 | 06:30 | 41,4 | 49,8 |
| 26 | 06:45 | 40,5 | 47,3 |
| 27 | 07:00 | 41,4 | 48,2 |
| 28 | 07:15 | 42,7 | 50,2 |
| 29 | 07:30 | 43,4 | 48,9 |
| 30 | 07:45 | 45,4 | 50,4 |
| 31 | 08:00 | 45,8 | 51,2 |
| 32 | 08:15 | 44,4 | 49,6 |
| 33 | 08:30 | 41,6 | 49,5 |
| 34 | 08:45 | 43,1 | 52,9 |
| 35 | 09:00 | 42,3 | 56,0 |
| 36 | 09:15 | 43,9 | 59,4 |
| 37 | 09:30 | 46,3 | 55,3 |
| 38 | 09:45 | 46,7 | 57,5 |
| 39 | 10:00 | 45,4 | 54,9 |
| 40 | 10:15 | 47,0 | 56,4 |
| 41 | 10:30 | 46,3 | 57,8 |
| 42 | 10:45 | 47,6 | 57,7 |
| 43 | 11:00 | 48,9 | 55,8 |
| 44 | 11:15 | 49,6 | 59,5 |
| 45 | 11:30 | 53,0 | 56,4 |
| 46 | 11:45 | 51,7 | 62,3 |
| 47 | 12:00 | 51,3 | 56,6 |
| 48 | 12:15 | 52,0 | 62,2 |
| 49 | 12:30 | 52,8 | 60,8 |
| 50 | 12:45 | 52,2 | 59,6 |
| 51 | 13:00 | 50,9 | 56,6 |
| 52 | 13:15 | 50,1 | 60,8 |
| 53 | 13:30 | 52,0 | 60,4 |
| 54 | 13:45 | 52,8 | 60,8 |
| 55 | 14:00 | 51,9 | 57,3 |
| 56 | 14:15 | 50,4 | 58,0 |
| 57 | 14:30 | 52,1 | 58,5 |
| 58 | 14:45 | 50,3 | 59,7 |
| 59 | 15:00 | 51,2 | 56,4 |
| 60 | 15:15 | 53,4 | 61,0 |
| 61 | 15:30 | 52,8 | 60,1 |
| 62 | 15:45 | 52,3 | 60,8 |
| 63 | 16:00 | 50,8 | 59,9 |
| 64 | 16:15 | 50,2 | 59,3 |
| 65 | 16:30 | 54,1 | 59,8 |
| 66 | 16:45 | 51,5 | 57,6 |
| 67 | 17:00 | 52,2 | 57,1 |
| 68 | 17:15 | 52,4 | 58,9 |
| 69 | 17:30 | 51,8 | 62,2 |
| 70 | 17:45 | 50,3 | 63,3 |
| 71 | 18:00 | 46,8 | 61,6 |
| 72 | 18:15 | 48,0 | 58,6 |
| 73 | 18:30 | 46,1 | 54,8 |
| 74 | 18:45 | 47,5 | 56,8 |
| 75 | 19:00 | 46,3 | 56,9 |
| 76 | 19:15 | 45,1 | 55,8 |
| 77 | 19:30 | 47,4 | 57,4 |
| 78 | 19:45 | 47,3 | 59,6 |
| 79 | 20:00 | 45,1 | 55,7 |
| 80 | 20:15 | 45,6 | 54,9 |
| 81 | 20:30 | 43,7 | 56,0 |
| 82 | 20:45 | 44,9 | 54,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 47,4 | 55,6 |
| 84 | 21:15 | 45,2 | 56,2 |
| 85 | 21:30 | 44,0 | 53,8 |
| 86 | 21:45 | 44,5 | 52,6 |
| 87 | 22:00 | 44,1 | 53,2 |
| 88 | 22:15 | 44,2 | 52,6 |
| 89 | 22:30 | 44,6 | 51,7 |
| 90 | 22:45 | 47,9 | 52,1 |
| 91 | 23:00 | 47,6 | 56,2 |
| 92 | 23:15 | 46,6 | 55,2 |
| 93 | 23:30 | 41,6 | 52,5 |
| 94 | 23:45 | 42,1 | 50,3 |
| 95 | 00:00 | 42,0 | 49,5 |
| 96 | 00:15 | 42,6 | 53,8 |

**2.GÜN**
**23-24.09.2022**
**19.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,5 | 66,7 |
| 2 | 00:45 | 40,6 | 61,8 |
| 3 | 01:00 | 41,2 | 63,5 |
| 4 | 01:15 | 42,8 | 63,7 |
| 5 | 01:30 | 42,4 | 62,2 |
| 6 | 01:45 | 42,7 | 63,0 |
| 7 | 02:00 | 43,0 | 65,0 |
| 8 | 02:15 | 42,9 | 62,4 |
| 9 | 02:30 | 39,8 | 61,4 |
| 10 | 02:45 | 41,0 | 61,7 |
| 11 | 03:00 | 42,8 | 63,4 |
| 12 | 03:15 | 41,6 | 65,1 |
| 13 | 03:30 | 42,0 | 63,7 |
| 14 | 03:45 | 40,8 | 63,8 |
| 15 | 04:00 | 40,9 | 65,5 |
| 16 | 04:15 | 41,5 | 64,5 |
| 17 | 04:30 | 37,7 | 56,8 |
| 18 | 04:45 | 39,7 | 62,0 |
| 19 | 05:00 | 40,5 | 60,9 |
| 20 | 05:15 | 40,0 | 60,4 |
| 21 | 05:30 | 40,3 | 63,1 |
| 22 | 05:45 | 40,8 | 59,4 |
| 23 | 06:00 | 37,9 | 58,8 |
| 24 | 06:15 | 38,2 | 56,6 |
| 25 | 06:30 | 40,5 | 57,5 |
| 26 | 06:45 | 41,7 | 56,8 |
| 27 | 07:00 | 47,4 | 58,6 |
| 28 | 07:15 | 48,8 | 57,5 |
| 29 | 07:30 | 48,7 | 56,5 |
| 30 | 07:45 | 49,6 | 60,9 |
| 31 | 08:00 | 49,0 | 67,8 |
| 32 | 08:15 | 51,7 | 72,7 |
| 33 | 08:30 | 52,1 | 74,1 |
| 34 | 08:45 | 57,0 | 72,6 |
| 35 | 09:00 | 57,6 | 73,6 |
| 36 | 09:15 | 58,0 | 71,4 |
| 37 | 09:30 | 58,1 | 74,1 |
| 38 | 09:45 | 57,8 | 72,6 |
| 39 | 10:00 | 54,9 | 71,7 |
| 40 | 10:15 | 55,9 | 73,9 |
| 41 | 10:30 | 54,9 | 73,0 |
| 42 | 10:45 | 57,0 | 76,3 |
| 43 | 11:00 | 54,4 | 71,9 |
| 44 | 11:15 | 54,0 | 69,2 |
| 45 | 11:30 | 55,0 | 71,0 |
| 46 | 11:45 | 56,0 | 72,6 |
| 47 | 12:00 | 53,4 | 68,6 |
| 48 | 12:15 | 52,4 | 72,6 |
| 49 | 12:30 | 53,5 | 70,0 |
| 50 | 12:45 | 58,7 | 74,5 |
| 51 | 13:00 | 60,1 | 73,3 |
| 52 | 13:15 | 61,6 | 77,7 |
| 53 | 13:30 | 58,4 | 75,2 |
| 54 | 13:45 | 58,7 | 73,2 |
| 55 | 14:00 | 57,9 | 76,8 |
| 56 | 14:15 | 58,2 | 74,1 |
| 57 | 14:30 | 58,6 | 76,0 |
| 58 | 14:45 | 57,9 | 76,3 |
| 59 | 15:00 | 60,5 | 73,8 |
| 60 | 15:15 | 59,6 | 76,2 |
| 61 | 15:30 | 60,5 | 75,7 |
| 62 | 15:45 | 58,6 | 75,5 |
| 63 | 16:00 | 60,1 | 74,9 |
| 64 | 16:15 | 57,6 | 75,2 |
| 65 | 16:30 | 56,2 | 73,3 |
| 66 | 16:45 | 57,0 | 73,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 67 | 17:00 | 57,2 | 75,1 |
| 68 | 17:15 | 57,8 | 73,9 |
| 69 | 17:30 | 58,1 | 76,4 |
| 70 | 17:45 | 57,2 | 74,8 |
| 71 | 18:00 | 56,8 | 76,3 |
| 72 | 18:15 | 51,6 | 77,0 |
| 73 | 18:30 | 50,0 | 77,4 |
| 74 | 18:45 | 44,1 | 68,6 |
| 75 | 19:00 | 45,3 | 69,3 |
| 76 | 19:15 | 41,1 | 65,6 |
| 77 | 19:30 | 39,8 | 63,0 |
| 78 | 19:45 | 41,5 | 66,0 |
| 79 | 20:00 | 40,8 | 66,6 |
| 80 | 20:15 | 40,4 | 64,5 |
| 81 | 20:30 | 40,3 | 65,6 |
| 82 | 20:45 | 40,6 | 66,6 |
| 83 | 21:00 | 40,2 | 64,9 |
| 84 | 21:15 | 39,7 | 61,7 |
| 85 | 21:30 | 38,6 | 62,3 |
| 86 | 21:45 | 41,4 | 63,4 |
| 87 | 22:00 | 40,8 | 62,2 |
| 88 | 22:15 | 41,7 | 66,2 |
| 89 | 22:30 | 43,0 | 67,5 |
| 90 | 22:45 | 41,2 | 62,9 |
| 91 | 23:00 | 44,4 | 60,9 |
| 92 | 23:15 | 49,1 | 69,1 |
| 93 | 23:30 | 46,4 | 67,6 |
| 94 | 23:45 | 45,4 | 66,7 |
| 95 | 00:00 | 45,0 | 69,4 |
| 96 | 00:15 | 43,7 | 68,7 |

**2.GÜN**
**23-24.09.2022**
**20.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,2 | 61,2 |
| 2 | 00:45 | 36,9 | 56,2 |
| 3 | 01:00 | 36,7 | 56,6 |
| 4 | 01:15 | 38,1 | 56,8 |
| 5 | 01:30 | 38,6 | 56,6 |
| 6 | 01:45 | 38,0 | 56,1 |
| 7 | 02:00 | 38,7 | 58,5 |
| 8 | 02:15 | 39,0 | 56,8 |
| 9 | 02:30 | 37,6 | 58,0 |
| 10 | 02:45 | 37,3 | 56,1 |
| 11 | 03:00 | 38,9 | 57,6 |
| 12 | 03:15 | 39,0 | 61,0 |
| 13 | 03:30 | 38,2 | 57,9 |
| 14 | 03:45 | 37,5 | 58,6 |
| 15 | 04:00 | 37,2 | 59,5 |
| 16 | 04:15 | 37,4 | 58,0 |
| 17 | 04:30 | 36,0 | 54,0 |
| 18 | 04:45 | 37,7 | 58,9 |
| 19 | 05:00 | 38,5 | 57,9 |
| 20 | 05:15 | 38,0 | 57,4 |
| 21 | 05:30 | 38,3 | 57,0 |
| 22 | 05:45 | 38,6 | 53,9 |
| 23 | 06:00 | 36,3 | 52,3 |
| 24 | 06:15 | 36,4 | 51,3 |
| 25 | 06:30 | 38,5 | 54,4 |
| 26 | 06:45 | 39,6 | 52,7 |
| 27 | 07:00 | 45,1 | 57,3 |
| 28 | 07:15 | 46,3 | 51,8 |
| 29 | 07:30 | 46,0 | 53,5 |
| 30 | 07:45 | 45,1 | 55,4 |
| 31 | 08:00 | 44,0 | 58,5 |
| 32 | 08:15 | 48,9 | 60,5 |
| 33 | 08:30 | 47,4 | 59,7 |
| 34 | 08:45 | 51,3 | 61,0 |
| 35 | 09:00 | 53,2 | 63,7 |
| 36 | 09:15 | 51,6 | 66,1 |
| 37 | 09:30 | 51,7 | 68,6 |
| 38 | 09:45 | 50,4 | 67,1 |
| 39 | 10:00 | 52,0 | 67,9 |
| 40 | 10:15 | 52,4 | 69,4 |
| 41 | 10:30 | 51,5 | 68,5 |
| 42 | 10:45 | 50,8 | 71,7 |
| 43 | 11:00 | 51,1 | 67,5 |
| 44 | 11:15 | 50,7 | 65,0 |
| 45 | 11:30 | 50,1 | 64,5 |
| 46 | 11:45 | 51,0 | 66,1 |
| 47 | 12:00 | 50,6 | 65,0 |
| 48 | 12:15 | 47,6 | 66,1 |
| 49 | 12:30 | 50,7 | 66,3 |
| 50 | 12:45 | 53,4 | 67,7 |
| 51 | 13:00 | 50,7 | 70,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 52 | 13:15 | 50,2 | 69,9 |
| 53 | 13:30 | 51,4 | 71,2 |
| 54 | 13:45 | 52,6 | 66,6 |
| 55 | 14:00 | 51,0 | 72,6 |
| 56 | 14:15 | 51,3 | 70,2 |
| 57 | 14:30 | 49,8 | 69,2 |
| 58 | 14:45 | 52,1 | 68,8 |
| 59 | 15:00 | 51,4 | 69,9 |
| 60 | 15:15 | 51,0 | 70,0 |
| 61 | 15:30 | 51,4 | 71,7 |
| 62 | 15:45 | 51,9 | 69,4 |
| 63 | 16:00 | 51,1 | 70,9 |
| 64 | 16:15 | 52,3 | 71,9 |
| 65 | 16:30 | 51,2 | 66,7 |
| 66 | 16:45 | 51,9 | 69,2 |
| 67 | 17:00 | 52,0 | 68,3 |
| 68 | 17:15 | 52,5 | 67,2 |
| 69 | 17:30 | 51,8 | 72,4 |
| 70 | 17:45 | 52,1 | 70,8 |
| 71 | 18:00 | 52,2 | 72,8 |
| 72 | 18:15 | 49,2 | 73,4 |
| 73 | 18:30 | 47,7 | 73,8 |
| 74 | 18:45 | 42,0 | 65,5 |
| 75 | 19:00 | 43,2 | 66,2 |
| 76 | 19:15 | 39,3 | 62,5 |
| 77 | 19:30 | 37,9 | 60,1 |
| 78 | 19:45 | 39,3 | 62,4 |
| 79 | 20:00 | 38,6 | 63,0 |
| 80 | 20:15 | 36,7 | 58,6 |
| 81 | 20:30 | 38,1 | 62,0 |
| 82 | 20:45 | 36,5 | 59,9 |
| 83 | 21:00 | 38,0 | 61,4 |
| 84 | 21:15 | 36,1 | 56,1 |
| 85 | 21:30 | 36,5 | 58,9 |
| 86 | 21:45 | 37,3 | 57,1 |
| 87 | 22:00 | 38,6 | 58,8 |
| 88 | 22:15 | 38,0 | 60,2 |
| 89 | 22:30 | 39,1 | 61,4 |
| 90 | 22:45 | 37,5 | 57,2 |
| 91 | 23:00 | 40,3 | 55,4 |
| 92 | 23:15 | 46,4 | 65,5 |
| 93 | 23:30 | 42,3 | 61,5 |
| 94 | 23:45 | 42,9 | 63,1 |
| 95 | 00:00 | 40,9 | 63,1 |
| 96 | 00:15 | 39,6 | 62,4 |

**2.GÜN**
**23-24.09.2022**
**21.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,3 | 48,2 |
| 2 | 00:45 | 42,0 | 49,4 |
| 3 | 01:00 | 41,7 | 49,9 |
| 4 | 01:15 | 42,2 | 48,4 |
| 5 | 01:30 | 42,2 | 50,0 |
| 6 | 01:45 | 42,4 | 51,8 |
| 7 | 02:00 | 40,2 | 47,3 |
| 8 | 02:15 | 43,7 | 53,0 |
| 9 | 02:30 | 41,0 | 48,4 |
| 10 | 02:45 | 41,4 | 47,7 |
| 11 | 03:00 | 41,3 | 50,1 |
| 12 | 03:15 | 43,9 | 50,9 |
| 13 | 03:30 | 42,2 | 53,1 |
| 14 | 03:45 | 40,7 | 49,5 |
| 15 | 04:00 | 42,0 | 51,3 |
| 16 | 04:15 | 40,2 | 49,6 |
| 17 | 04:30 | 43,9 | 52,1 |
| 18 | 04:45 | 40,6 | 50,3 |
| 19 | 05:00 | 43,1 | 53,3 |
| 20 | 05:15 | 39,5 | 47,5 |
| 21 | 05:30 | 40,7 | 51,2 |
| 22 | 05:45 | 39,8 | 48,2 |
| 23 | 06:00 | 37,9 | 47,4 |
| 24 | 06:15 | 39,2 | 48,1 |
| 25 | 06:30 | 42,3 | 51,3 |
| 26 | 06:45 | 41,5 | 51,2 |
| 27 | 07:00 | 42,1 | 51,4 |
| 28 | 07:15 | 43,8 | 53,1 |
| 29 | 07:30 | 43,0 | 54,0 |
| 30 | 07:45 | 47,2 | 55,4 |
| 31 | 08:00 | 50,6 | 56,6 |
| 32 | 08:15 | 50,8 | 59,0 |
| 33 | 08:30 | 50,1 | 59,1 |
| 34 | 08:45 | 50,2 | 60,5 |
| 35 | 09:00 | 52,0 | 59,6 |
| 36 | 09:15 | 53,3 | 61,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 37 | 09:30 | 52,2 | 60,4 |
| 38 | 09:45 | 50,0 | 56,0 |
| 39 | 10:00 | 49,8 | 56,6 |
| 40 | 10:15 | 50,9 | 59,0 |
| 41 | 10:30 | 53,2 | 59,3 |
| 42 | 10:45 | 49,2 | 54,4 |
| 43 | 11:00 | 49,9 | 57,3 |
| 44 | 11:15 | 50,4 | 58,6 |
| 45 | 11:30 | 51,2 | 59,7 |
| 46 | 11:45 | 51,8 | 59,9 |
| 47 | 12:00 | 48,1 | 55,2 |
| 48 | 12:15 | 50,2 | 56,3 |
| 49 | 12:30 | 48,7 | 55,8 |
| 50 | 12:45 | 49,1 | 53,8 |
| 51 | 13:00 | 51,2 | 56,1 |
| 52 | 13:15 | 51,2 | 56,8 |
| 53 | 13:30 | 52,9 | 57,2 |
| 54 | 13:45 | 50,5 | 56,1 |
| 55 | 14:00 | 50,4 | 56,4 |
| 56 | 14:15 | 51,3 | 58,2 |
| 57 | 14:30 | 52,6 | 58,3 |
| 58 | 14:45 | 48,8 | 53,6 |
| 59 | 15:00 | 52,2 | 58,9 |
| 60 | 15:15 | 51,6 | 57,3 |
| 61 | 15:30 | 50,3 | 57,2 |
| 62 | 15:45 | 47,6 | 52,8 |
| 63 | 16:00 | 48,2 | 54,4 |
| 64 | 16:15 | 52,1 | 55,4 |
| 65 | 16:30 | 48,7 | 53,8 |
| 66 | 16:45 | 47,4 | 53,2 |
| 67 | 17:00 | 48,4 | 55,5 |
| 68 | 17:15 | 47,8 | 54,3 |
| 69 | 17:30 | 50,5 | 57,5 |
| 70 | 17:45 | 51,2 | 58,1 |
| 71 | 18:00 | 49,9 | 59,5 |
| 72 | 18:15 | 50,4 | 60,4 |
| 73 | 18:30 | 48,7 | 57,5 |
| 74 | 18:45 | 48,7 | 57,2 |
| 75 | 19:00 | 49,1 | 59,0 |
| 76 | 19:15 | 47,9 | 56,0 |
| 77 | 19:30 | 50,3 | 56,8 |
| 78 | 19:45 | 50,2 | 58,4 |
| 79 | 20:00 | 48,3 | 55,0 |
| 80 | 20:15 | 47,2 | 55,5 |
| 81 | 20:30 | 46,1 | 55,6 |
| 82 | 20:45 | 43,4 | 50,2 |
| 83 | 21:00 | 43,8 | 51,8 |
| 84 | 21:15 | 42,5 | 50,3 |
| 85 | 21:30 | 46,5 | 53,6 |
| 86 | 21:45 | 45,0 | 53,8 |
| 87 | 22:00 | 42,7 | 51,1 |
| 88 | 22:15 | 43,8 | 52,0 |
| 89 | 22:30 | 42,6 | 50,8 |
| 90 | 22:45 | 45,7 | 53,6 |
| 91 | 23:00 | 43,3 | 50,4 |
| 92 | 23:15 | 42,4 | 50,6 |
| 93 | 23:30 | 42,8 | 50,6 |
| 94 | 23:45 | 39,4 | 47,4 |
| 95 | 00:00 | 40,4 | 48,4 |
| 96 | 00:15 | 40,1 | 48,1 |

**2.GÜN**
**23-24.09.2022**
**22.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,3 | 56,5 |
| 2 | 00:45 | 35,9 | 57,3 |
| 3 | 01:00 | 37,9 | 59,3 |
| 4 | 01:15 | 39,2 | 59,6 |
| 5 | 01:30 | 41,8 | 60,4 |
| 6 | 01:45 | 41,8 | 60,3 |
| 7 | 02:00 | 40,2 | 58,0 |
| 8 | 02:15 | 42,2 | 58,9 |
| 9 | 02:30 | 38,8 | 56,0 |
| 10 | 02:45 | 39,1 | 57,2 |
| 11 | 03:00 | 39,7 | 57,9 |
| 12 | 03:15 | 38,7 | 57,4 |
| 13 | 03:30 | 40,0 | 57,8 |
| 14 | 03:45 | 38,5 | 55,9 |
| 15 | 04:00 | 38,5 | 58,1 |
| 16 | 04:15 | 39,2 | 56,1 |
| 17 | 04:30 | 38,2 | 55,3 |
| 18 | 04:45 | 37,5 | 53,2 |
| 19 | 05:00 | 40,5 | 54,7 |
| 20 | 05:15 | 37,3 | 55,2 |
| 21 | 05:30 | 39,0 | 56,8 |
| 22 | 05:45 | 39,7 | 56,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 23 | 06:00 | 35,5 | 50,5 |
| 24 | 06:15 | 37,8 | 55,5 |
| 25 | 06:30 | 38,1 | 53,9 |
| 26 | 06:45 | 37,8 | 55,5 |
| 27 | 07:00 | 41,9 | 57,6 |
| 28 | 07:15 | 39,4 | 54,5 |
| 29 | 07:30 | 38,4 | 53,2 |
| 30 | 07:45 | 38,8 | 54,0 |
| 31 | 08:00 | 38,8 | 54,1 |
| 32 | 08:15 | 42,6 | 57,8 |
| 33 | 08:30 | 43,4 | 60,2 |
| 34 | 08:45 | 49,0 | 64,6 |
| 35 | 09:00 | 50,5 | 66,9 |
| 36 | 09:15 | 50,1 | 67,1 |
| 37 | 09:30 | 50,0 | 66,9 |
| 38 | 09:45 | 50,1 | 67,3 |
| 39 | 10:00 | 49,5 | 61,9 |
| 40 | 10:15 | 49,3 | 64,8 |
| 41 | 10:30 | 49,8 | 62,8 |
| 42 | 10:45 | 50,0 | 65,4 |
| 43 | 11:00 | 50,1 | 65,4 |
| 44 | 11:15 | 51,3 | 65,9 |
| 45 | 11:30 | 52,2 | 67,0 |
| 46 | 11:45 | 52,9 | 68,7 |
| 47 | 12:00 | 50,1 | 64,1 |
| 48 | 12:15 | 49,9 | 65,6 |
| 49 | 12:30 | 51,3 | 66,4 |
| 50 | 12:45 | 54,7 | 67,8 |
| 51 | 13:00 | 53,8 | 68,5 |
| 52 | 13:15 | 53,9 | 70,3 |
| 53 | 13:30 | 49,8 | 63,4 |
| 54 | 13:45 | 50,5 | 64,8 |
| 55 | 14:00 | 49,8 | 65,1 |
| 56 | 14:15 | 48,3 | 64,2 |
| 57 | 14:30 | 48,2 | 65,5 |
| 58 | 14:45 | 50,6 | 65,2 |
| 59 | 15:00 | 50,5 | 66,7 |
| 60 | 15:15 | 50,1 | 64,0 |
| 61 | 15:30 | 52,3 | 65,2 |
| 62 | 15:45 | 51,6 | 65,9 |
| 63 | 16:00 | 52,3 | 67,6 |
| 64 | 16:15 | 52,6 | 65,9 |
| 65 | 16:30 | 52,1 | 63,8 |
| 66 | 16:45 | 48,9 | 65,4 |
| 67 | 17:00 | 49,2 | 66,1 |
| 68 | 17:15 | 49,8 | 63,5 |
| 69 | 17:30 | 50,5 | 65,8 |
| 70 | 17:45 | 51,1 | 67,1 |
| 71 | 18:00 | 50,5 | 65,8 |
| 72 | 18:15 | 45,3 | 59,8 |
| 73 | 18:30 | 44,6 | 61,4 |
| 74 | 18:45 | 41,1 | 58,6 |
| 75 | 19:00 | 40,9 | 59,8 |
| 76 | 19:15 | 36,7 | 55,7 |
| 77 | 19:30 | 35,9 | 54,3 |
| 78 | 19:45 | 38,0 | 57,5 |
| 79 | 20:00 | 38,1 | 57,9 |
| 80 | 20:15 | 37,6 | 58,6 |
| 81 | 20:30 | 39,0 | 59,9 |
| 82 | 20:45 | 40,9 | 60,9 |
| 83 | 21:00 | 40,3 | 60,4 |
| 84 | 21:15 | 41,3 | 57,6 |
| 85 | 21:30 | 40,4 | 56,2 |
| 86 | 21:45 | 40,8 | 58,0 |
| 87 | 22:00 | 40,1 | 58,8 |
| 88 | 22:15 | 41,1 | 60,7 |
| 89 | 22:30 | 41,8 | 60,4 |
| 90 | 22:45 | 40,0 | 56,4 |
| 91 | 23:00 | 43,1 | 60,6 |
| 92 | 23:15 | 43,5 | 65,5 |
| 93 | 23:30 | 40,4 | 58,5 |
| 94 | 23:45 | 40,1 | 59,8 |
| 95 | 00:00 | 41,5 | 59,0 |
| 96 | 00:15 | 42,7 | 62,2 |

**2.GÜN**
**23-24.09.2022**
**23.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,8 | 51,6 |
| 2 | 00:45 | 40,3 | 47,2 |
| 3 | 01:00 | 42,2 | 50,3 |
| 4 | 01:15 | 40,5 | 46,3 |
| 5 | 01:30 | 42,3 | 49,7 |
| 6 | 01:45 | 40,7 | 49,4 |
| 7 | 02:00 | 40,5 | 47,7 |
| 8 | 02:15 | 41,9 | 50,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 02:30 | 40,9 | 48,3 | 53 | 13:30 | 52,1 | 56,5 |
| 10 | 02:45 | 41,3 | 47,7 | 54 | 13:45 | 51,0 | 56,5 |
| 11 | 03:00 | 42,5 | 51,4 | 55 | 14:00 | 52,9 | 59,2 |
| 12 | 03:15 | 45,1 | 52,4 | 56 | 14:15 | 51,7 | 58,4 |
| 13 | 03:30 | 41,8 | 52,4 | 57 | 14:30 | 49,3 | 61,0 |
| 14 | 03:45 | 41,8 | 50,9 | 58 | 14:45 | 51,9 | 56,8 |
| 15 | 04:00 | 41,5 | 50,7 | 59 | 15:00 | 50,7 | 59,0 |
| 16 | 04:15 | 41,3 | 51,1 | 60 | 15:15 | 52,0 | 57,7 |
| 17 | 04:30 | 41,8 | 49,3 | 61 | 15:30 | 49,7 | 56,5 |
| 18 | 04:45 | 40,9 | 50,8 | 62 | 15:45 | 47,9 | 53,0 |
| 19 | 05:00 | 41,5 | 51,1 | 63 | 16:00 | 48,7 | 54,8 |
| 20 | 05:15 | 39,5 | 47,5 | 64 | 16:15 | 51,7 | 55,3 |
| 21 | 05:30 | 38,9 | 49,0 | 65 | 16:30 | 49,0 | 54,3 |
| 22 | 05:45 | 38,1 | 46,1 | 66 | 16:45 | 49,5 | 55,7 |
| 23 | 06:00 | 37,9 | 47,2 | 67 | 17:00 | 48,8 | 56,0 |
| 24 | 06:15 | 39,5 | 48,4 | 68 | 17:15 | 50,2 | 56,8 |
| 25 | 06:30 | 40,5 | 49,2 | 69 | 17:30 | 51,0 | 58,0 |
| 26 | 06:45 | 41,2 | 50,5 | 70 | 17:45 | 53,9 | 61,1 |
| 27 | 07:00 | 42,4 | 51,8 | 71 | 18:00 | 50,3 | 59,9 |
| 28 | 07:15 | 45,6 | 55,0 | 72 | 18:15 | 50,4 | 60,4 |
| 29 | 07:30 | 45,1 | 56,5 | 73 | 18:30 | 51,3 | 60,1 |
| 30 | 07:45 | 50,4 | 59,2 | 74 | 18:45 | 46,1 | 54,2 |
| 31 | 08:00 | 54,1 | 60,7 | 75 | 19:00 | 48,6 | 58,4 |
| 32 | 08:15 | 53,0 | 61,6 | 76 | 19:15 | 47,2 | 55,3 |
| 33 | 08:30 | 53,7 | 63,1 | 77 | 19:30 | 47,7 | 54,1 |
| 34 | 08:45 | 53,2 | 64,0 | 78 | 19:45 | 47,5 | 55,3 |
| 35 | 09:00 | 54,3 | 62,3 | 79 | 20:00 | 47,7 | 54,2 |
| 36 | 09:15 | 53,6 | 63,9 | 80 | 20:15 | 47,0 | 55,4 |
| 37 | 09:30 | 54,4 | 63,2 | 81 | 20:30 | 43,6 | 52,7 |
| 38 | 09:45 | 52,2 | 58,7 | 82 | 20:45 | 42,9 | 49,5 |
| 39 | 10:00 | 50,5 | 57,5 | 83 | 21:00 | 43,6 | 51,7 |
| 40 | 10:15 | 53,5 | 61,8 | 84 | 21:15 | 41,9 | 49,6 |
| 41 | 10:30 | 55,1 | 61,3 | 85 | 21:30 | 44,2 | 50,9 |
| 42 | 10:45 | 51,8 | 57,0 | 86 | 21:45 | 43,6 | 52,0 |
| 43 | 11:00 | 50,9 | 58,4 | 87 | 22:00 | 41,4 | 49,4 |
| 44 | 11:15 | 48,9 | 56,7 | 88 | 22:15 | 42,4 | 50,2 |
| 45 | 11:30 | 52,6 | 61,2 | 89 | 22:30 | 41,4 | 49,3 |
| 46 | 11:45 | 50,1 | 58,0 | 90 | 22:45 | 44,3 | 51,9 |
| 47 | 12:00 | 49,1 | 56,2 | 91 | 23:00 | 41,9 | 48,9 |
| 48 | 12:15 | 48,6 | 54,5 | 92 | 23:15 | 42,5 | 50,5 |
| 49 | 12:30 | 49,2 | 56,1 | 93 | 23:30 | 43,1 | 49,9 |
| 50 | 12:45 | 51,6 | 56,5 | 94 | 23:45 | 40,7 | 49,4 |
| 51 | 13:00 | 54,2 | 59,6 | 95 | 00:00 | 40,3 | 48,3 |
| 52 | 13:15 | 51,6 | 57,3 | 96 | 00:15 | 44,2 | 52,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**2.GÜN**
**23-24.09.2022**
**24.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,7 | 61,6 |
| 2 | 00:45 | 41,4 | 61,0 |
| 3 | 01:00 | 42,4 | 63,9 |
| 4 | 01:15 | 44,4 | 66,3 |
| 5 | 01:30 | 44,6 | 61,7 |
| 6 | 01:45 | 44,5 | 59,9 |
| 7 | 02:00 | 41,8 | 54,4 |
| 8 | 02:15 | 43,4 | 64,8 |
| 9 | 02:30 | 42,2 | 59,7 |
| 10 | 02:45 | 43,9 | 62,4 |
| 11 | 03:00 | 44,1 | 56,6 |
| 12 | 03:15 | 44,2 | 59,8 |
| 13 | 03:30 | 45,5 | 64,9 |
| 14 | 03:45 | 45,3 | 67,0 |
| 15 | 04:00 | 45,4 | 62,7 |
| 16 | 04:15 | 45,5 | 64,6 |
| 17 | 04:30 | 45,2 | 66,5 |
| 18 | 04:45 | 41,0 | 59,8 |
| 19 | 05:00 | 42,1 | 57,2 |
| 20 | 05:15 | 40,0 | 54,9 |
| 21 | 05:30 | 41,3 | 55,0 |
| 22 | 05:45 | 39,5 | 54,6 |
| 23 | 06:00 | 37,5 | 55,0 |
| 24 | 06:15 | 39,0 | 54,1 |
| 25 | 06:30 | 40,8 | 55,4 |
| 26 | 06:45 | 40,5 | 52,1 |
| 27 | 07:00 | 44,1 | 60,4 |
| 28 | 07:15 | 39,8 | 54,5 |
| 29 | 07:30 | 43,0 | 53,8 |
| 30 | 07:45 | 46,6 | 54,3 |
| 31 | 08:00 | 47,1 | 53,0 |
| 32 | 08:15 | 48,6 | 53,8 |
| 33 | 08:30 | 48,9 | 55,6 |
| 34 | 08:45 | 49,3 | 53,4 |
| 35 | 09:00 | 49,8 | 62,0 |
| 36 | 09:15 | 50,0 | 59,7 |
| 37 | 09:30 | 50,5 | 58,0 |
| 38 | 09:45 | 50,9 | 60,1 |
| 39 | 10:00 | 52,0 | 57,7 |
| 40 | 10:15 | 51,8 | 58,7 |
| 41 | 10:30 | 52,4 | 62,0 |
| 42 | 10:45 | 53,0 | 57,1 |
| 43 | 11:00 | 52,8 | 59,5 |
| 44 | 11:15 | 52,2 | 60,2 |
| 45 | 11:30 | 51,8 | 61,9 |
| 46 | 11:45 | 53,0 | 58,5 |
| 47 | 12:00 | 52,8 | 56,5 |
| 48 | 12:15 | 53,5 | 58,6 |
| 49 | 12:30 | 53,6 | 60,3 |
| 50 | 12:45 | 53,8 | 60,8 |
| 51 | 13:00 | 53,3 | 62,6 |
| 52 | 13:15 | 52,5 | 59,5 |
| 53 | 13:30 | 52,4 | 58,0 |
| 54 | 13:45 | 51,9 | 60,5 |
| 55 | 14:00 | 52,1 | 56,9 |
| 56 | 14:15 | 51,4 | 59,6 |
| 57 | 14:30 | 50,1 | 56,3 |
| 58 | 14:45 | 50,5 | 58,0 |
| 59 | 15:00 | 50,9 | 60,2 |
| 60 | 15:15 | 50,8 | 59,5 |
| 61 | 15:30 | 51,0 | 56,6 |
| 62 | 15:45 | 50,6 | 55,2 |
| 63 | 16:00 | 51,2 | 59,5 |
| 64 | 16:15 | 50,8 | 57,1 |
| 65 | 16:30 | 50,8 | 58,5 |
| 66 | 16:45 | 51,3 | 57,7 |
| 67 | 17:00 | 51,9 | 58,5 |
| 68 | 17:15 | 51,6 | 55,9 |
| 69 | 17:30 | 50,5 | 58,6 |
| 70 | 17:45 | 50,6 | 60,1 |
| 71 | 18:00 | 51,0 | 58,2 |
| 72 | 18:15 | 50,8 | 57,7 |
| 73 | 18:30 | 51,1 | 62,3 |
| 74 | 18:45 | 52,0 | 61,8 |
| 75 | 19:00 | 51,6 | 59,8 |
| 76 | 19:15 | 51,3 | 55,1 |
| 77 | 19:30 | 51,7 | 60,8 |
| 78 | 19:45 | 51,6 | 62,3 |
| 79 | 20:00 | 49,3 | 57,2 |
| 80 | 20:15 | 45,8 | 58,5 |
| 81 | 20:30 | 44,4 | 62,6 |
| 82 | 20:45 | 43,7 | 60,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 42,9 | 55,0 |
| 84 | 21:15 | 43,8 | 57,0 |
| 85 | 21:30 | 44,2 | 59,1 |
| 86 | 21:45 | 43,8 | 58,6 |
| 87 | 22:00 | 43,8 | 57,1 |
| 88 | 22:15 | 43,9 | 57,7 |
| 89 | 22:30 | 44,0 | 59,6 |
| 90 | 22:45 | 45,4 | 64,6 |
| 91 | 23:00 | 46,2 | 62,2 |
| 92 | 23:15 | 45,8 | 60,3 |
| 93 | 23:30 | 40,4 | 59,3 |
| 94 | 23:45 | 39,5 | 56,4 |
| 95 | 00:00 | 38,8 | 59,7 |
| 96 | 00:15 | 41,8 | 60,7 |

**2.GÜN**
**23-24.09.2022**
**25.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,1 | 51,2 |
| 2 | 00:45 | 40,4 | 57,1 |
| 3 | 01:00 | 41,1 | 58,0 |
| 4 | 01:15 | 42,4 | 57,3 |
| 5 | 01:30 | 44,9 | 58,5 |
| 6 | 01:45 | 44,6 | 57,0 |
| 7 | 02:00 | 41,8 | 51,7 |
| 8 | 02:15 | 43,4 | 51,1 |
| 9 | 02:30 | 40,4 | 53,6 |
| 10 | 02:45 | 41,9 | 56,5 |
| 11 | 03:00 | 42,0 | 51,3 |
| 12 | 03:15 | 41,7 | 53,6 |
| 13 | 03:30 | 43,1 | 58,0 |
| 14 | 03:45 | 42,7 | 60,1 |
| 15 | 04:00 | 42,9 | 56,1 |
| 16 | 04:15 | 43,1 | 57,9 |
| 17 | 04:30 | 42,6 | 59,6 |
| 18 | 04:45 | 43,1 | 56,6 |
| 19 | 05:00 | 44,9 | 54,6 |
| 20 | 05:15 | 42,6 | 52,2 |
| 21 | 05:30 | 43,8 | 52,3 |
| 22 | 05:45 | 42,0 | 51,8 |
| 23 | 06:00 | 37,9 | 49,7 |
| 24 | 06:15 | 39,4 | 49,2 |
| 25 | 06:30 | 41,4 | 49,9 |
| 26 | 06:45 | 41,2 | 47,1 |
| 27 | 07:00 | 42,9 | 50,7 |
| 28 | 07:15 | 38,9 | 48,9 |
| 29 | 07:30 | 42,1 | 50,6 |
| 30 | 07:45 | 45,4 | 51,2 |
| 31 | 08:00 | 45,6 | 48,1 |
| 32 | 08:15 | 44,5 | 50,1 |
| 33 | 08:30 | 44,9 | 48,0 |
| 34 | 08:45 | 44,3 | 50,3 |
| 35 | 09:00 | 44,1 | 51,6 |
| 36 | 09:15 | 46,0 | 53,3 |
| 37 | 09:30 | 46,4 | 54,5 |
| 38 | 09:45 | 45,4 | 51,6 |
| 39 | 10:00 | 46,2 | 51,8 |
| 40 | 10:15 | 45,9 | 53,1 |
| 41 | 10:30 | 46,4 | 51,6 |
| 42 | 10:45 | 47,0 | 55,3 |
| 43 | 11:00 | 48,7 | 53,5 |
| 44 | 11:15 | 47,1 | 54,0 |
| 45 | 11:30 | 48,0 | 55,6 |
| 46 | 11:45 | 49,0 | 52,6 |
| 47 | 12:00 | 47,2 | 54,3 |
| 48 | 12:15 | 48,1 | 51,0 |
| 49 | 12:30 | 48,1 | 52,4 |
| 50 | 12:45 | 48,3 | 52,9 |
| 51 | 13:00 | 47,8 | 54,5 |
| 52 | 13:15 | 46,8 | 53,5 |
| 53 | 13:30 | 46,5 | 52,0 |
| 54 | 13:45 | 48,1 | 54,2 |
| 55 | 14:00 | 46,4 | 51,2 |
| 56 | 14:15 | 47,5 | 53,6 |
| 57 | 14:30 | 46,2 | 50,6 |
| 58 | 14:45 | 46,4 | 52,0 |
| 59 | 15:00 | 46,8 | 54,0 |
| 60 | 15:15 | 46,8 | 53,5 |
| 61 | 15:30 | 47,0 | 50,7 |
| 62 | 15:45 | 46,7 | 49,6 |
| 63 | 16:00 | 47,2 | 53,5 |
| 64 | 16:15 | 46,8 | 51,4 |
| 65 | 16:30 | 45,5 | 50,9 |
| 66 | 16:45 | 45,9 | 50,2 |
| 67 | 17:00 | 46,5 | 50,9 |
| 68 | 17:15 | 46,2 | 48,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 69 | 17:30 | 46,4 | 52,7 |
| 70 | 17:45 | 46,7 | 53,9 |
| 71 | 18:00 | 47,0 | 54,9 |
| 72 | 18:15 | 46,8 | 54,3 |
| 73 | 18:30 | 47,1 | 58,9 |
| 74 | 18:45 | 48,1 | 58,3 |
| 75 | 19:00 | 47,7 | 56,3 |
| 76 | 19:15 | 45,4 | 49,9 |
| 77 | 19:30 | 45,8 | 55,3 |
| 78 | 19:45 | 47,7 | 58,9 |
| 79 | 20:00 | 48,7 | 53,9 |
| 80 | 20:15 | 42,2 | 55,4 |
| 81 | 20:30 | 43,5 | 58,9 |
| 82 | 20:45 | 46,1 | 57,5 |
| 83 | 21:00 | 45,2 | 51,7 |
| 84 | 21:15 | 44,5 | 52,2 |
| 85 | 21:30 | 42,6 | 54,0 |
| 86 | 21:45 | 43,7 | 53,7 |
| 87 | 22:00 | 42,7 | 52,2 |
| 88 | 22:15 | 46,5 | 54,4 |
| 89 | 22:30 | 44,2 | 56,1 |
| 90 | 22:45 | 41,3 | 56,9 |
| 91 | 23:00 | 42,1 | 54,7 |
| 92 | 23:15 | 43,6 | 55,0 |
| 93 | 23:30 | 38,5 | 54,4 |
| 94 | 23:45 | 38,5 | 51,5 |
| 95 | 00:00 | 39,5 | 54,7 |
| 96 | 00:15 | 42,2 | 59,4 |

**2.GÜN**
**23-24.09.2022**
**26.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,2 | 48,0 |
| 2 | 00:45 | 42,4 | 50,7 |
| 3 | 01:00 | 40,1 | 48,9 |
| 4 | 01:15 | 41,9 | 50,0 |
| 5 | 01:30 | 40,7 | 48,9 |
| 6 | 01:45 | 42,0 | 49,7 |
| 7 | 02:00 | 39,5 | 48,4 |
| 8 | 02:15 | 42,4 | 49,9 |
| 9 | 02:30 | 40,6 | 46,9 |
| 10 | 02:45 | 40,0 | 48,0 |
| 11 | 03:00 | 39,8 | 48,9 |
| 12 | 03:15 | 41,4 | 47,7 |
| 13 | 03:30 | 41,6 | 52,0 |
| 14 | 03:45 | 40,4 | 48,3 |
| 15 | 04:00 | 41,6 | 51,0 |
| 16 | 04:15 | 39,2 | 50,8 |
| 17 | 04:30 | 41,8 | 52,4 |
| 18 | 04:45 | 40,2 | 48,0 |
| 19 | 05:00 | 41,5 | 50,4 |
| 20 | 05:15 | 39,5 | 48,4 |
| 21 | 05:30 | 39,0 | 48,3 |
| 22 | 05:45 | 38,7 | 48,6 |
| 23 | 06:00 | 37,4 | 44,8 |
| 24 | 06:15 | 37,8 | 45,4 |
| 25 | 06:30 | 40,6 | 49,1 |
| 26 | 06:45 | 39,1 | 43,3 |
| 27 | 07:00 | 39,7 | 46,3 |
| 28 | 07:15 | 41,3 | 48,3 |
| 29 | 07:30 | 41,8 | 47,2 |
| 30 | 07:45 | 45,6 | 51,0 |
| 31 | 08:00 | 46,0 | 51,6 |
| 32 | 08:15 | 45,9 | 51,3 |
| 33 | 08:30 | 48,3 | 51,3 |
| 34 | 08:45 | 49,5 | 54,7 |
| 35 | 09:00 | 49,5 | 56,5 |
| 36 | 09:15 | 51,5 | 59,7 |
| 37 | 09:30 | 50,8 | 55,9 |
| 38 | 09:45 | 51,9 | 57,0 |
| 39 | 10:00 | 52,6 | 56,3 |
| 40 | 10:15 | 50,8 | 55,9 |
| 41 | 10:30 | 51,4 | 57,8 |
| 42 | 10:45 | 48,5 | 58,2 |
| 43 | 11:00 | 48,4 | 54,1 |
| 44 | 11:15 | 50,3 | 55,1 |
| 45 | 11:30 | 49,9 | 54,6 |
| 46 | 11:45 | 51,6 | 60,2 |
| 47 | 12:00 | 49,8 | 54,8 |
| 48 | 12:15 | 52,4 | 59,5 |
| 49 | 12:30 | 51,2 | 55,9 |
| 50 | 12:45 | 52,6 | 57,0 |
| 51 | 13:00 | 51,2 | 57,1 |
| 52 | 13:15 | 53,9 | 61,3 |
| 53 | 13:30 | 52,2 | 61,0 |
| 54 | 13:45 | 50,2 | 59,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 55 | 14:00 | 52,3 | 57,8 |
| 56 | 14:15 | 50,1 | 58,1 |
| 57 | 14:30 | 53,6 | 59,3 |
| 58 | 14:45 | 50,7 | 59,9 |
| 59 | 15:00 | 54,6 | 60,0 |
| 60 | 15:15 | 53,8 | 61,5 |
| 61 | 15:30 | 53,3 | 60,7 |
| 62 | 15:45 | 52,8 | 61,1 |
| 63 | 16:00 | 54,8 | 60,7 |
| 64 | 16:15 | 54,0 | 59,7 |
| 65 | 16:30 | 54,3 | 60,5 |
| 66 | 16:45 | 52,3 | 58,6 |
| 67 | 17:00 | 55,7 | 60,7 |
| 68 | 17:15 | 52,9 | 59,3 |
| 69 | 17:30 | 55,8 | 63,4 |
| 70 | 17:45 | 52,6 | 61,9 |
| 71 | 18:00 | 47,6 | 62,7 |
| 72 | 18:15 | 48,3 | 58,8 |
| 73 | 18:30 | 43,6 | 55,3 |
| 74 | 18:45 | 44,9 | 53,7 |
| 75 | 19:00 | 42,7 | 52,5 |
| 76 | 19:15 | 41,8 | 51,4 |
| 77 | 19:30 | 43,6 | 53,0 |
| 78 | 19:45 | 41,0 | 51,4 |
| 79 | 20:00 | 39,5 | 48,9 |
| 80 | 20:15 | 39,8 | 47,7 |
| 81 | 20:30 | 39,9 | 51,0 |
| 82 | 20:45 | 37,8 | 46,5 |
| 83 | 21:00 | 39,6 | 46,5 |
| 84 | 21:15 | 38,0 | 47,6 |
| 85 | 21:30 | 39,5 | 47,6 |
| 86 | 21:45 | 39,9 | 47,2 |
| 87 | 22:00 | 39,4 | 47,9 |
| 88 | 22:15 | 39,8 | 47,2 |
| 89 | 22:30 | 40,0 | 46,4 |
| 90 | 22:45 | 43,0 | 46,6 |
| 91 | 23:00 | 43,7 | 50,5 |
| 92 | 23:15 | 43,2 | 50,9 |
| 93 | 23:30 | 40,6 | 52,2 |
| 94 | 23:45 | 39,8 | 47,7 |
| 95 | 00:00 | 41,4 | 49,0 |
| 96 | 00:15 | 36,9 | 47,2 |

**2.GÜN**

**23-24.09.2022**
**27.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,1 | 56,8 |
| 2 | 00:45 | 40,5 | 54,8 |
| 3 | 01:00 | 38,9 | 57,1 |
| 4 | 01:15 | 41,5 | 62,4 |
| 5 | 01:30 | 43,4 | 60,1 |
| 6 | 01:45 | 44,9 | 57,3 |
| 7 | 02:00 | 44,7 | 55,2 |
| 8 | 02:15 | 43,4 | 63,1 |
| 9 | 02:30 | 43,4 | 58,2 |
| 10 | 02:45 | 43,3 | 58,2 |
| 11 | 03:00 | 43,4 | 53,0 |
| 12 | 03:15 | 44,4 | 57,1 |
| 13 | 03:30 | 43,4 | 58,5 |
| 14 | 03:45 | 43,5 | 61,2 |
| 15 | 04:00 | 43,3 | 56,6 |
| 16 | 04:15 | 43,0 | 57,8 |
| 17 | 04:30 | 45,0 | 63,1 |
| 18 | 04:45 | 43,2 | 63,6 |
| 19 | 05:00 | 45,3 | 58,5 |
| 20 | 05:15 | 44,9 | 58,2 |
| 21 | 05:30 | 44,6 | 56,0 |
| 22 | 05:45 | 42,4 | 55,4 |
| 23 | 06:00 | 40,1 | 55,7 |
| 24 | 06:15 | 37,7 | 56,9 |
| 25 | 06:30 | 41,2 | 52,6 |
| 26 | 06:45 | 39,1 | 54,1 |
| 27 | 07:00 | 41,1 | 57,5 |
| 28 | 07:15 | 42,2 | 56,0 |
| 29 | 07:30 | 45,5 | 58,1 |
| 30 | 07:45 | 47,2 | 56,3 |
| 31 | 08:00 | 46,9 | 58,0 |
| 32 | 08:15 | 50,9 | 57,5 |
| 33 | 08:30 | 49,3 | 56,7 |
| 34 | 08:45 | 48,0 | 54,9 |
| 35 | 09:00 | 52,6 | 57,5 |
| 36 | 09:15 | 51,6 | 59,4 |
| 37 | 09:30 | 52,0 | 61,2 |
| 38 | 09:45 | 52,4 | 62,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 39 | 10:00 | 53,0 | 63,5 |
| 40 | 10:15 | 52,3 | 59,7 |
| 41 | 10:30 | 52,8 | 61,1 |
| 42 | 10:45 | 51,4 | 59,7 |
| 43 | 11:00 | 52,4 | 62,6 |
| 44 | 11:15 | 51,9 | 63,1 |
| 45 | 11:30 | 52,8 | 61,3 |
| 46 | 11:45 | 51,8 | 60,6 |
| 47 | 12:00 | 54,2 | 62,5 |
| 48 | 12:15 | 52,7 | 58,5 |
| 49 | 12:30 | 51,9 | 60,1 |
| 50 | 12:45 | 53,1 | 58,3 |
| 51 | 13:00 | 55,2 | 63,1 |
| 52 | 13:15 | 52,9 | 58,0 |
| 53 | 13:30 | 52,5 | 63,0 |
| 54 | 13:45 | 52,9 | 61,4 |
| 55 | 14:00 | 52,5 | 62,0 |
| 56 | 14:15 | 51,3 | 61,3 |
| 57 | 14:30 | 50,9 | 55,8 |
| 58 | 14:45 | 50,7 | 56,7 |
| 59 | 15:00 | 51,7 | 61,9 |
| 60 | 15:15 | 51,7 | 63,9 |
| 61 | 15:30 | 51,8 | 66,0 |
| 62 | 15:45 | 51,9 | 57,8 |
| 63 | 16:00 | 52,0 | 64,1 |
| 64 | 16:15 | 51,7 | 62,3 |
| 65 | 16:30 | 49,9 | 58,8 |
| 66 | 16:45 | 52,6 | 60,5 |
| 67 | 17:00 | 51,3 | 58,7 |
| 68 | 17:15 | 50,8 | 56,3 |
| 69 | 17:30 | 51,3 | 63,3 |
| 70 | 17:45 | 52,4 | 64,7 |
| 71 | 18:00 | 50,4 | 58,9 |
| 72 | 18:15 | 50,2 | 58,3 |
| 73 | 18:30 | 50,5 | 63,1 |
| 74 | 18:45 | 53,0 | 64,0 |
| 75 | 19:00 | 51,8 | 61,3 |
| 76 | 19:15 | 50,0 | 54,9 |
| 77 | 19:30 | 52,7 | 63,2 |
| 78 | 19:45 | 51,5 | 67,3 |
| 79 | 20:00 | 52,9 | 61,8 |
| 80 | 20:15 | 46,6 | 60,8 |
| 81 | 20:30 | 45,3 | 65,0 |
| 82 | 20:45 | 40,9 | 58,0 |
| 83 | 21:00 | 42,3 | 55,1 |
| 84 | 21:15 | 40,1 | 53,3 |
| 85 | 21:30 | 42,2 | 57,6 |
| 86 | 21:45 | 39,5 | 54,2 |
| 87 | 22:00 | 41,6 | 55,5 |
| 88 | 22:15 | 41,3 | 55,6 |
| 89 | 22:30 | 41,4 | 57,3 |
| 90 | 22:45 | 39,9 | 57,9 |
| 91 | 23:00 | 40,7 | 56,0 |
| 92 | 23:15 | 43,7 | 58,6 |
| 93 | 23:30 | 39,6 | 59,1 |
| 94 | 23:45 | 40,3 | 58,5 |
| 95 | 00:00 | 40,1 | 59,7 |
| 96 | 00:15 | 38,4 | 56,8 |

**2.GÜN**
**23-24.09.2022**
**28.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,7 | 56,1 |
| 2 | 00:45 | 37,9 | 51,4 |
| 3 | 01:00 | 37,1 | 54,9 |
| 4 | 01:15 | 40,2 | 60,0 |
| 5 | 01:30 | 41,1 | 60,0 |
| 6 | 01:45 | 42,6 | 58,4 |
| 7 | 02:00 | 39,8 | 53,0 |
| 8 | 02:15 | 44,4 | 63,2 |
| 9 | 02:30 | 40,0 | 53,6 |
| 10 | 02:45 | 41,6 | 56,0 |
| 11 | 03:00 | 41,8 | 50,8 |
| 12 | 03:15 | 41,4 | 53,2 |
| 13 | 03:30 | 44,1 | 59,4 |
| 14 | 03:45 | 43,7 | 61,4 |
| 15 | 04:00 | 43,9 | 57,4 |
| 16 | 04:15 | 44,1 | 59,3 |
| 17 | 04:30 | 43,6 | 61,1 |
| 18 | 04:45 | 41,6 | 57,6 |
| 19 | 05:00 | 41,0 | 56,0 |
| 20 | 05:15 | 41,3 | 53,3 |
| 21 | 05:30 | 42,6 | 53,6 |
| 22 | 05:45 | 40,7 | 53,2 |
| 23 | 06:00 | 36,6 | 50,9 |
| 24 | 06:15 | 35,7 | 47,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 25 | 06:30 | 39,4 | 50,4 |
| 26 | 06:45 | 38,0 | 46,2 |
| 27 | 07:00 | 40,6 | 55,9 |
| 28 | 07:15 | 41,7 | 57,5 |
| 29 | 07:30 | 40,6 | 56,2 |
| 30 | 07:45 | 41,0 | 56,9 |
| 31 | 08:00 | 41,0 | 57,0 |
| 32 | 08:15 | 44,9 | 61,0 |
| 33 | 08:30 | 45,9 | 63,5 |
| 34 | 08:45 | 51,7 | 68,2 |
| 35 | 09:00 | 51,4 | 70,5 |
| 36 | 09:15 | 52,9 | 70,7 |
| 37 | 09:30 | 52,8 | 70,5 |
| 38 | 09:45 | 52,9 | 71,0 |
| 39 | 10:00 | 52,3 | 65,4 |
| 40 | 10:15 | 52,1 | 68,4 |
| 41 | 10:30 | 52,6 | 66,3 |
| 42 | 10:45 | 52,8 | 69,0 |
| 43 | 11:00 | 52,9 | 69,0 |
| 44 | 11:15 | 50,6 | 69,6 |
| 45 | 11:30 | 52,1 | 70,6 |
| 46 | 11:45 | 52,9 | 72,5 |
| 47 | 12:00 | 52,9 | 67,7 |
| 48 | 12:15 | 52,7 | 69,3 |
| 49 | 12:30 | 51,8 | 70,1 |
| 50 | 12:45 | 52,8 | 71,6 |
| 51 | 13:00 | 52,8 | 72,3 |
| 52 | 13:15 | 51,9 | 74,2 |
| 53 | 13:30 | 52,6 | 66,9 |
| 54 | 13:45 | 51,4 | 68,4 |
| 55 | 14:00 | 52,6 | 68,7 |
| 56 | 14:15 | 50,9 | 67,8 |
| 57 | 14:30 | 50,8 | 69,2 |
| 58 | 14:45 | 51,5 | 68,8 |
| 59 | 15:00 | 51,4 | 70,4 |
| 60 | 15:15 | 52,9 | 67,6 |
| 61 | 15:30 | 52,3 | 68,8 |
| 62 | 15:45 | 51,5 | 69,6 |
| 63 | 16:00 | 52,3 | 71,3 |
| 64 | 16:15 | 52,6 | 69,6 |
| 65 | 16:30 | 52,0 | 67,4 |
| 66 | 16:45 | 51,6 | 69,0 |
| 67 | 17:00 | 52,0 | 69,8 |
| 68 | 17:15 | 52,6 | 67,1 |
| 69 | 17:30 | 51,4 | 69,5 |
| 70 | 17:45 | 52,0 | 70,7 |
| 71 | 18:00 | 51,4 | 69,5 |
| 72 | 18:15 | 47,9 | 63,1 |
| 73 | 18:30 | 47,1 | 64,7 |
| 74 | 18:45 | 43,3 | 61,9 |
| 75 | 19:00 | 43,1 | 63,1 |
| 76 | 19:15 | 38,7 | 58,8 |
| 77 | 19:30 | 37,9 | 57,3 |
| 78 | 19:45 | 40,2 | 60,7 |
| 79 | 20:00 | 40,3 | 61,1 |
| 80 | 20:15 | 39,8 | 61,9 |
| 81 | 20:30 | 39,8 | 61,0 |
| 82 | 20:45 | 40,2 | 59,8 |
| 83 | 21:00 | 39,6 | 59,3 |
| 84 | 21:15 | 40,6 | 56,5 |
| 85 | 21:30 | 39,7 | 55,3 |
| 86 | 21:45 | 40,0 | 56,8 |
| 87 | 22:00 | 39,3 | 57,5 |
| 88 | 22:15 | 41,3 | 55,7 |
| 89 | 22:30 | 41,5 | 57,4 |
| 90 | 22:45 | 39,9 | 58,1 |
| 91 | 23:00 | 40,5 | 57,0 |
| 92 | 23:15 | 40,0 | 55,4 |
| 93 | 23:30 | 37,8 | 58,0 |
| 94 | 23:45 | 37,0 | 55,3 |
| 95 | 00:00 | 37,6 | 56,2 |
| 96 | 00:15 | 38,5 | 56,2 |

**2.GÜN**
**23-24.09.2022**
**29.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,9 | 48,8 |
| 2 | 00:45 | 40,3 | 46,2 |
| 3 | 01:00 | 42,1 | 47,4 |
| 4 | 01:15 | 39,7 | 45,8 |
| 5 | 01:30 | 41,3 | 48,7 |
| 6 | 01:45 | 40,4 | 45,1 |
| 7 | 02:00 | 40,7 | 46,5 |
| 8 | 02:15 | 41,6 | 47,4 |
| 9 | 02:30 | 39,7 | 46,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 10 | 02:45 | 38,6 | 44,6 |
| 11 | 03:00 | 38,5 | 44,9 |
| 12 | 03:15 | 40,7 | 45,4 |
| 13 | 03:30 | 39,2 | 45,0 |
| 14 | 03:45 | 39,0 | 45,1 |
| 15 | 04:00 | 38,7 | 44,5 |
| 16 | 04:15 | 38,3 | 44,5 |
| 17 | 04:30 | 39,7 | 45,0 |
| 18 | 04:45 | 39,9 | 45,9 |
| 19 | 05:00 | 41,1 | 47,4 |
| 20 | 05:15 | 39,8 | 45,9 |
| 21 | 05:30 | 39,7 | 44,9 |
| 22 | 05:45 | 37,5 | 44,2 |
| 23 | 06:00 | 38,1 | 44,6 |
| 24 | 06:15 | 39,5 | 46,0 |
| 25 | 06:30 | 40,3 | 47,7 |
| 26 | 06:45 | 40,7 | 46,3 |
| 27 | 07:00 | 39,9 | 47,4 |
| 28 | 07:15 | 43,3 | 49,3 |
| 29 | 07:30 | 44,0 | 50,7 |
| 30 | 07:45 | 46,8 | 51,6 |
| 31 | 08:00 | 46,7 | 52,4 |
| 32 | 08:15 | 46,7 | 54,1 |
| 33 | 08:30 | 48,6 | 55,3 |
| 34 | 08:45 | 52,6 | 56,6 |
| 35 | 09:00 | 51,9 | 57,5 |
| 36 | 09:15 | 51,0 | 56,4 |
| 37 | 09:30 | 52,5 | 56,1 |
| 38 | 09:45 | 48,6 | 58,0 |
| 39 | 10:00 | 48,1 | 59,6 |
| 40 | 10:15 | 50,7 | 61,2 |
| 41 | 10:30 | 51,5 | 61,3 |
| 42 | 10:45 | 49,1 | 59,2 |
| 43 | 11:00 | 50,3 | 61,9 |
| 44 | 11:15 | 48,7 | 59,8 |
| 45 | 11:30 | 53,0 | 59,2 |
| 46 | 11:45 | 51,5 | 60,8 |
| 47 | 12:00 | 50,7 | 62,4 |
| 48 | 12:15 | 51,3 | 62,1 |
| 49 | 12:30 | 52,3 | 61,2 |
| 50 | 12:45 | 52,6 | 59,1 |
| 51 | 13:00 | 54,5 | 60,8 |
| 52 | 13:15 | 53,0 | 62,1 |
| 53 | 13:30 | 53,5 | 62,8 |
| 54 | 13:45 | 51,8 | 65,0 |
| 55 | 14:00 | 53,7 | 63,7 |
| 56 | 14:15 | 53,2 | 59,6 |
| 57 | 14:30 | 56,1 | 63,1 |
| 58 | 14:45 | 54,4 | 60,1 |
| 59 | 15:00 | 56,2 | 62,3 |
| 60 | 15:15 | 55,0 | 60,4 |
| 61 | 15:30 | 52,7 | 58,8 |
| 62 | 15:45 | 51,2 | 58,0 |
| 63 | 16:00 | 52,4 | 59,0 |
| 64 | 16:15 | 55,4 | 59,5 |
| 65 | 16:30 | 52,4 | 60,7 |
| 66 | 16:45 | 51,8 | 62,0 |
| 67 | 17:00 | 53,4 | 60,5 |
| 68 | 17:15 | 55,4 | 63,6 |
| 69 | 17:30 | 54,0 | 62,4 |
| 70 | 17:45 | 56,3 | 60,5 |
| 71 | 18:00 | 51,6 | 59,6 |
| 72 | 18:15 | 46,7 | 61,8 |
| 73 | 18:30 | 47,0 | 61,1 |
| 74 | 18:45 | 46,0 | 59,3 |
| 75 | 19:00 | 49,1 | 58,1 |
| 76 | 19:15 | 47,8 | 55,1 |
| 77 | 19:30 | 48,2 | 54,4 |
| 78 | 19:45 | 48,7 | 55,5 |
| 79 | 20:00 | 48,9 | 54,7 |
| 80 | 20:15 | 48,4 | 54,5 |
| 81 | 20:30 | 44,9 | 50,2 |
| 82 | 20:45 | 42,9 | 49,2 |
| 83 | 21:00 | 43,8 | 49,7 |
| 84 | 21:15 | 41,6 | 47,6 |
| 85 | 21:30 | 43,0 | 49,7 |
| 86 | 21:45 | 43,1 | 48,7 |
| 87 | 22:00 | 41,1 | 47,3 |
| 88 | 22:15 | 42,1 | 49,0 |
| 89 | 22:30 | 40,1 | 47,4 |
| 90 | 22:45 | 43,2 | 49,9 |
| 91 | 23:00 | 44,0 | 51,9 |
| 92 | 23:15 | 44,0 | 51,0 |
| 93 | 23:30 | 43,9 | 50,1 |
| 94 | 23:45 | 42,7 | 48,0 |
| 95 | 00:00 | 41,0 | 47,5 |
| 96 | 00:15 | 42,9 | 48,8 |

**2.GÜN**

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**23-24.09.2022**
**30.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,8 | 54,5 |
| 2 | 00:45 | 40,3 | 54,3 |
| 3 | 01:00 | 41,6 | 54,0 |
| 4 | 01:15 | 43,3 | 59,3 |
| 5 | 01:30 | 43,0 | 58,0 |
| 6 | 01:45 | 43,2 | 58,8 |
| 7 | 02:00 | 43,4 | 60,5 |
| 8 | 02:15 | 43,4 | 58,2 |
| 9 | 02:30 | 40,1 | 57,3 |
| 10 | 02:45 | 40,4 | 56,3 |
| 11 | 03:00 | 41,0 | 56,1 |
| 12 | 03:15 | 39,9 | 57,6 |
| 13 | 03:30 | 40,3 | 56,5 |
| 14 | 03:45 | 38,8 | 56,1 |
| 15 | 04:00 | 38,9 | 57,4 |
| 16 | 04:15 | 39,5 | 56,4 |
| 17 | 04:30 | 38,6 | 53,4 |
| 18 | 04:45 | 40,4 | 58,2 |
| 19 | 05:00 | 41,2 | 57,5 |
| 20 | 05:15 | 40,7 | 56,8 |
| 21 | 05:30 | 41,0 | 59,3 |
| 22 | 05:45 | 41,6 | 56,1 |
| 23 | 06:00 | 38,8 | 55,3 |
| 24 | 06:15 | 39,0 | 53,2 |
| 25 | 06:30 | 39,4 | 54,0 |
| 26 | 06:45 | 39,0 | 53,3 |
| 27 | 07:00 | 43,7 | 57,3 |
| 28 | 07:15 | 45,0 | 58,9 |
| 29 | 07:30 | 44,7 | 57,5 |
| 30 | 07:45 | 45,8 | 58,3 |
| 31 | 08:00 | 45,1 | 60,0 |
| 32 | 08:15 | 50,0 | 64,0 |
| 33 | 08:30 | 50,4 | 66,3 |
| 34 | 08:45 | 55,4 | 64,9 |
| 35 | 09:00 | 55,9 | 65,7 |
| 36 | 09:15 | 56,3 | 64,1 |
| 37 | 09:30 | 56,3 | 66,1 |
| 38 | 09:45 | 56,5 | 65,4 |
| 39 | 10:00 | 53,9 | 64,7 |
| 40 | 10:15 | 54,8 | 66,7 |
| 41 | 10:30 | 53,9 | 65,9 |
| 42 | 10:45 | 54,8 | 67,8 |
| 43 | 11:00 | 54,6 | 66,1 |
| 44 | 11:15 | 53,9 | 64,0 |
| 45 | 11:30 | 55,0 | 65,4 |
| 46 | 11:45 | 56,2 | 66,7 |
| 47 | 12:00 | 53,3 | 63,4 |
| 48 | 12:15 | 52,0 | 67,0 |
| 49 | 12:30 | 53,5 | 64,5 |
| 50 | 12:45 | 56,3 | 65,9 |
| 51 | 13:00 | 57,6 | 64,9 |
| 52 | 13:15 | 58,9 | 69,0 |
| 53 | 13:30 | 54,5 | 64,6 |
| 54 | 13:45 | 54,3 | 62,4 |
| 55 | 14:00 | 53,5 | 65,3 |
| 56 | 14:15 | 53,9 | 63,1 |
| 57 | 14:30 | 54,1 | 64,6 |
| 58 | 14:45 | 53,5 | 64,9 |
| 59 | 15:00 | 55,8 | 63,0 |
| 60 | 15:15 | 54,9 | 64,8 |
| 61 | 15:30 | 55,8 | 64,3 |
| 62 | 15:45 | 54,1 | 64,2 |
| 63 | 16:00 | 55,6 | 63,9 |
| 64 | 16:15 | 53,7 | 64,6 |
| 65 | 16:30 | 52,3 | 63,0 |
| 66 | 16:45 | 53,1 | 62,9 |
| 67 | 17:00 | 53,2 | 64,6 |
| 68 | 17:15 | 53,9 | 63,7 |
| 69 | 17:30 | 53,7 | 65,1 |
| 70 | 17:45 | 52,7 | 63,5 |
| 71 | 18:00 | 52,4 | 64,9 |
| 72 | 18:15 | 47,6 | 65,4 |
| 73 | 18:30 | 46,2 | 65,8 |
| 74 | 18:45 | 43,0 | 61,8 |
| 75 | 19:00 | 44,5 | 62,8 |
| 76 | 19:15 | 40,3 | 59,2 |
| 77 | 19:30 | 40,4 | 59,2 |
| 78 | 19:45 | 42,8 | 62,8 |
| 79 | 20:00 | 42,1 | 63,4 |
| 80 | 20:15 | 41,6 | 61,5 |
| 81 | 20:30 | 41,5 | 62,3 |
| 82 | 20:45 | 41,9 | 63,4 |


rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 41,4 | 61,7 |
| 84 | 21:15 | 40,7 | 58,6 |
| 85 | 21:30 | 39,8 | 59,3 |
| 86 | 21:45 | 41,9 | 59,1 |
| 87 | 22:00 | 41,1 | 57,9 |
| 88 | 22:15 | 42,1 | 61,7 |
| 89 | 22:30 | 42,9 | 62,3 |
| 90 | 22:45 | 41,4 | 57,9 |
| 91 | 23:00 | 44,3 | 56,1 |
| 92 | 23:15 | 47,6 | 61,7 |
| 93 | 23:30 | 45,0 | 60,6 |
| 94 | 23:45 | 44,1 | 59,7 |
| 95 | 00:00 | 43,7 | 62,1 |
| 96 | 00:15 | 42,4 | 61,5 |

**2.GÜN**
**23-24.09.2022**
**31.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,2 | 50,9 |
| 2 | 00:45 | 42,1 | 49,6 |
| 3 | 01:00 | 42,0 | 50,3 |
| 4 | 01:15 | 41,8 | 49,1 |
| 5 | 01:30 | 41,0 | 49,1 |
| 6 | 01:45 | 40,8 | 48,7 |
| 7 | 02:00 | 40,0 | 47,5 |
| 8 | 02:15 | 42,5 | 51,2 |
| 9 | 02:30 | 40,2 | 47,7 |
| 10 | 02:45 | 38,4 | 45,4 |
| 11 | 03:00 | 40,0 | 47,4 |
| 12 | 03:15 | 41,6 | 48,6 |
| 13 | 03:30 | 40,4 | 48,1 |
| 14 | 03:45 | 38,5 | 46,5 |
| 15 | 04:00 | 40,7 | 48,0 |
| 16 | 04:15 | 39,1 | 46,3 |
| 17 | 04:30 | 39,7 | 47,2 |
| 18 | 04:45 | 38,6 | 45,8 |
| 19 | 05:00 | 41,1 | 48,5 |
| 20 | 05:15 | 37,9 | 44,6 |
| 21 | 05:30 | 40,5 | 47,1 |
| 22 | 05:45 | 38,9 | 47,0 |
| 23 | 06:00 | 37,1 | 44,3 |
| 24 | 06:15 | 38,4 | 45,7 |
| 25 | 06:30 | 41,2 | 48,2 |
| 26 | 06:45 | 39,5 | 47,2 |
| 27 | 07:00 | 43,1 | 52,3 |
| 28 | 07:15 | 43,8 | 52,9 |
| 29 | 07:30 | 44,8 | 53,9 |
| 30 | 07:45 | 47,6 | 54,8 |
| 31 | 08:00 | 48,1 | 54,4 |
| 32 | 08:15 | 49,5 | 54,7 |
| 33 | 08:30 | 47,6 | 53,5 |
| 34 | 08:45 | 52,2 | 59,1 |
| 35 | 09:00 | 52,7 | 58,5 |
| 36 | 09:15 | 53,4 | 60,7 |
| 37 | 09:30 | 54,9 | 63,0 |
| 38 | 09:45 | 52,7 | 60,2 |
| 39 | 10:00 | 53,5 | 59,2 |
| 40 | 10:15 | 53,9 | 60,5 |
| 41 | 10:30 | 54,6 | 61,1 |
| 42 | 10:45 | 50,0 | 58,6 |
| 43 | 11:00 | 49,1 | 56,8 |
| 44 | 11:15 | 50,5 | 58,2 |
| 45 | 11:30 | 50,3 | 58,8 |
| 46 | 11:45 | 53,1 | 61,1 |
| 47 | 12:00 | 48,9 | 56,8 |
| 48 | 12:15 | 51,9 | 59,4 |
| 49 | 12:30 | 49,5 | 57,0 |
| 50 | 12:45 | 50,4 | 57,6 |
| 51 | 13:00 | 53,0 | 61,1 |
| 52 | 13:15 | 53,0 | 59,8 |
| 53 | 13:30 | 54,1 | 62,2 |
| 54 | 13:45 | 53,3 | 61,1 |
| 55 | 14:00 | 53,1 | 61,4 |
| 56 | 14:15 | 53,7 | 61,0 |
| 57 | 14:30 | 48,0 | 62,1 |
| 58 | 14:45 | 48,8 | 63,6 |
| 59 | 15:00 | 53,2 | 61,0 |
| 60 | 15:15 | 53,1 | 61,2 |
| 61 | 15:30 | 55,6 | 64,8 |
| 62 | 15:45 | 54,0 | 61,4 |
| 63 | 16:00 | 53,2 | 61,2 |
| 64 | 16:15 | 55,8 | 64,3 |
| 65 | 16:30 | 53,6 | 62,1 |
| 66 | 16:45 | 53,1 | 60,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 67 | 17:00 | 55,4 | 63,8 |
| 68 | 17:15 | 52,8 | 60,0 |
| 69 | 17:30 | 53,2 | 61,7 |
| 70 | 17:45 | 54,9 | 63,8 |
| 71 | 18:00 | 54,0 | 65,5 |
| 72 | 18:15 | 52,0 | 63,0 |
| 73 | 18:30 | 47,5 | 57,8 |
| 74 | 18:45 | 46,2 | 56,7 |
| 75 | 19:00 | 47,1 | 57,1 |
| 76 | 19:15 | 44,7 | 55,1 |
| 77 | 19:30 | 46,4 | 57,6 |
| 78 | 19:45 | 45,5 | 55,8 |
| 79 | 20:00 | 45,5 | 54,4 |
| 80 | 20:15 | 45,1 | 54,0 |
| 81 | 20:30 | 43,8 | 52,6 |
| 82 | 20:45 | 39,7 | 47,5 |
| 83 | 21:00 | 40,0 | 48,8 |
| 84 | 21:15 | 40,2 | 48,3 |
| 85 | 21:30 | 42,3 | 50,3 |
| 86 | 21:45 | 42,3 | 50,7 |
| 87 | 22:00 | 41,9 | 49,2 |
| 88 | 22:15 | 42,8 | 49,1 |
| 89 | 22:30 | 40,1 | 47,6 |
| 90 | 22:45 | 43,8 | 50,4 |
| 91 | 23:00 | 43,3 | 52,5 |
| 92 | 23:15 | 44,3 | 53,4 |
| 93 | 23:30 | 45,1 | 53,7 |
| 94 | 23:45 | 42,5 | 48,8 |
| 95 | 00:00 | 43,5 | 49,9 |
| 96 | 00:15 | 42,8 | 49,7 |

**2.GÜN**
**23-24.09.2022**
**32.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 43,7 | 63,9 |
| 2 | 00:45 | 44,0 | 63,4 |
| 3 | 01:00 | 44,5 | 66,4 |
| 4 | 01:15 | 47,0 | 63,6 |
| 5 | 01:30 | 47,6 | 68,2 |
| 6 | 01:45 | 47,3 | 64,3 |
| 7 | 02:00 | 46,6 | 63,3 |
| 8 | 02:15 | 46,1 | 63,1 |
| 9 | 02:30 | 44,3 | 63,5 |
| 10 | 02:45 | 44,6 | 66,3 |
| 11 | 03:00 | 44,8 | 59,9 |
| 12 | 03:15 | 44,5 | 62,9 |
| 13 | 03:30 | 44,9 | 66,5 |
| 14 | 03:45 | 44,5 | 64,7 |
| 15 | 04:00 | 44,7 | 62,1 |
| 16 | 04:15 | 44,9 | 61,3 |
| 17 | 04:30 | 44,4 | 60,2 |
| 18 | 04:45 | 45,3 | 64,6 |
| 19 | 05:00 | 44,7 | 63,5 |
| 20 | 05:15 | 44,3 | 59,2 |
| 21 | 05:30 | 44,0 | 57,5 |
| 22 | 05:45 | 42,0 | 60,4 |
| 23 | 06:00 | 39,4 | 54,1 |
| 24 | 06:15 | 38,9 | 56,1 |
| 25 | 06:30 | 40,9 | 57,4 |
| 26 | 06:45 | 40,3 | 54,0 |
| 27 | 07:00 | 42,3 | 59,3 |
| 28 | 07:15 | 41,8 | 55,5 |
| 29 | 07:30 | 45,2 | 57,6 |
| 30 | 07:45 | 48,0 | 58,1 |
| 31 | 08:00 | 49,0 | 54,5 |
| 32 | 08:15 | 50,4 | 57,0 |
| 33 | 08:30 | 50,3 | 54,4 |
| 34 | 08:45 | 51,7 | 57,1 |
| 35 | 09:00 | 52,1 | 58,4 |
| 36 | 09:15 | 52,3 | 60,4 |
| 37 | 09:30 | 52,7 | 62,1 |
| 38 | 09:45 | 53,3 | 58,4 |
| 39 | 10:00 | 52,5 | 58,7 |
| 40 | 10:15 | 52,3 | 59,0 |
| 41 | 10:30 | 52,8 | 61,1 |
| 42 | 10:45 | 53,5 | 62,1 |
| 43 | 11:00 | 53,2 | 60,6 |
| 44 | 11:15 | 54,8 | 61,2 |
| 45 | 11:30 | 54,4 | 63,1 |
| 46 | 11:45 | 55,6 | 59,7 |
| 47 | 12:00 | 53,8 | 61,3 |
| 48 | 12:15 | 54,3 | 62,1 |
| 49 | 12:30 | 54,4 | 59,5 |
| 50 | 12:45 | 54,6 | 60,2 |
| 51 | 13:00 | 54,1 | 62,0 |
| 52 | 13:15 | 56,1 | 60,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 53 | 13:30 | 54,9 | 59,1 |
| 54 | 13:45 | 54,5 | 61,6 |
| 55 | 14:00 | 54,7 | 58,1 |
| 56 | 14:15 | 53,9 | 60,7 |
| 57 | 14:30 | 51,1 | 57,5 |
| 58 | 14:45 | 52,7 | 59,1 |
| 59 | 15:00 | 53,3 | 61,2 |
| 60 | 15:15 | 53,2 | 60,6 |
| 61 | 15:30 | 53,4 | 57,8 |
| 62 | 15:45 | 52,9 | 56,2 |
| 63 | 16:00 | 53,6 | 60,6 |
| 64 | 16:15 | 53,2 | 58,2 |
| 65 | 16:30 | 51,5 | 58,1 |
| 66 | 16:45 | 52,2 | 57,1 |
| 67 | 17:00 | 52,9 | 58,0 |
| 68 | 17:15 | 52,5 | 59,6 |
| 69 | 17:30 | 52,7 | 61,3 |
| 70 | 17:45 | 52,9 | 61,1 |
| 71 | 18:00 | 53,4 | 62,3 |
| 72 | 18:15 | 53,1 | 61,7 |
| 73 | 18:30 | 53,5 | 64,3 |
| 74 | 18:45 | 54,6 | 65,1 |
| 75 | 19:00 | 54,1 | 63,0 |
| 76 | 19:15 | 50,0 | 61,3 |
| 77 | 19:30 | 52,2 | 62,6 |
| 78 | 19:45 | 54,1 | 66,7 |
| 79 | 20:00 | 55,4 | 61,1 |
| 80 | 20:15 | 48,1 | 59,0 |
| 81 | 20:30 | 45,0 | 57,6 |
| 82 | 20:45 | 42,7 | 60,6 |
| 83 | 21:00 | 41,9 | 54,6 |
| 84 | 21:15 | 41,5 | 54,9 |
| 85 | 21:30 | 41,9 | 57,1 |
| 86 | 21:45 | 41,2 | 56,5 |
| 87 | 22:00 | 41,3 | 54,8 |
| 88 | 22:15 | 42,7 | 57,2 |
| 89 | 22:30 | 42,8 | 59,1 |
| 90 | 22:45 | 39,9 | 59,8 |
| 91 | 23:00 | 40,8 | 57,6 |
| 92 | 23:15 | 42,1 | 58,1 |
| 93 | 23:30 | 39,7 | 61,0 |
| 94 | 23:45 | 38,9 | 58,0 |
| 95 | 00:00 | 40,1 | 61,6 |
| 96 | 00:15 | 38,6 | 56,0 |

**2.GÜN**
**23-24.09.2022**
**33.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,5 | 59,6 |
| 2 | 00:45 | 41,3 | 63,0 |
| 3 | 01:00 | 42,6 | 66,8 |
| 4 | 01:15 | 40,9 | 64,7 |
| 5 | 01:30 | 44,8 | 65,2 |
| 6 | 01:45 | 42,1 | 65,2 |
| 7 | 02:00 | 42,8 | 62,7 |
| 8 | 02:15 | 45,9 | 67,9 |
| 9 | 02:30 | 47,1 | 63,7 |
| 10 | 02:45 | 44,7 | 64,7 |
| 11 | 03:00 | 45,8 | 66,6 |
| 12 | 03:15 | 47,6 | 63,7 |
| 13 | 03:30 | 42,9 | 61,7 |
| 14 | 03:45 | 41,2 | 61,7 |
| 15 | 04:00 | 40,4 | 60,5 |
| 16 | 04:15 | 39,3 | 62,0 |
| 17 | 04:30 | 45,0 | 63,0 |
| 18 | 04:45 | 44,1 | 64,7 |
| 19 | 05:00 | 42,7 | 66,4 |
| 20 | 05:15 | 43,1 | 64,4 |
| 21 | 05:30 | 39,9 | 57,5 |
| 22 | 05:45 | 38,6 | 57,5 |
| 23 | 06:00 | 37,7 | 60,0 |
| 24 | 06:15 | 37,8 | 56,4 |
| 25 | 06:30 | 39,9 | 56,4 |
| 26 | 06:45 | 37,6 | 61,0 |
| 27 | 07:00 | 38,6 | 61,4 |
| 28 | 07:15 | 43,0 | 65,6 |
| 29 | 07:30 | 45,3 | 59,4 |
| 30 | 07:45 | 48,8 | 61,5 |
| 31 | 08:00 | 48,6 | 63,8 |
| 32 | 08:15 | 50,9 | 69,3 |
| 33 | 08:30 | 52,4 | 67,3 |
| 34 | 08:45 | 53,3 | 67,1 |
| 35 | 09:00 | 52,8 | 69,6 |
| 36 | 09:15 | 52,0 | 65,6 |
| 37 | 09:30 | 53,9 | 63,1 |
| 38 | 09:45 | 51,3 | 65,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 39 | 10:00 | 51,4 | 66,7 |
| 40 | 10:15 | 52,8 | 64,7 |
| 41 | 10:30 | 51,2 | 64,8 |
| 42 | 10:45 | 50,7 | 62,5 |
| 43 | 11:00 | 52,4 | 61,7 |
| 44 | 11:15 | 49,9 | 60,3 |
| 45 | 11:30 | 50,7 | 66,0 |
| 46 | 11:45 | 47,9 | 61,2 |
| 47 | 12:00 | 49,0 | 59,6 |
| 48 | 12:15 | 45,6 | 57,5 |
| 49 | 12:30 | 48,2 | 60,4 |
| 50 | 12:45 | 48,0 | 57,9 |
| 51 | 13:00 | 50,8 | 65,3 |
| 52 | 13:15 | 47,3 | 63,5 |
| 53 | 13:30 | 50,7 | 61,6 |
| 54 | 13:45 | 47,6 | 59,5 |
| 55 | 14:00 | 51,3 | 61,5 |
| 56 | 14:15 | 52,9 | 61,9 |
| 57 | 14:30 | 52,2 | 66,4 |
| 58 | 14:45 | 48,5 | 64,8 |
| 59 | 15:00 | 50,7 | 63,5 |
| 60 | 15:15 | 51,2 | 61,0 |
| 61 | 15:30 | 51,9 | 57,1 |
| 62 | 15:45 | 48,6 | 55,3 |
| 63 | 16:00 | 50,6 | 59,3 |
| 64 | 16:15 | 53,0 | 62,0 |
| 65 | 16:30 | 48,0 | 59,3 |
| 66 | 16:45 | 51,7 | 61,0 |
| 67 | 17:00 | 48,8 | 64,5 |
| 68 | 17:15 | 50,8 | 64,5 |
| 69 | 17:30 | 51,0 | 66,6 |
| 70 | 17:45 | 50,5 | 65,8 |
| 71 | 18:00 | 45,8 | 66,6 |
| 72 | 18:15 | 48,4 | 71,3 |
| 73 | 18:30 | 49,9 | 69,6 |
| 74 | 18:45 | 47,0 | 66,1 |
| 75 | 19:00 | 49,2 | 71,0 |
| 76 | 19:15 | 49,1 | 64,3 |
| 77 | 19:30 | 51,6 | 67,1 |
| 78 | 19:45 | 52,9 | 68,3 |
| 79 | 20:00 | 45,4 | 63,9 |
| 80 | 20:15 | 44,8 | 63,2 |
| 81 | 20:30 | 43,0 | 58,3 |
| 82 | 20:45 | 39,8 | 59,5 |
| 83 | 21:00 | 43,3 | 61,7 |
| 84 | 21:15 | 40,7 | 61,7 |
| 85 | 21:30 | 42,6 | 60,5 |
| 86 | 21:45 | 38,3 | 60,8 |
| 87 | 22:00 | 39,1 | 60,3 |
| 88 | 22:15 | 40,6 | 59,6 |
| 89 | 22:30 | 43,0 | 59,6 |
| 90 | 22:45 | 45,5 | 60,6 |
| 91 | 23:00 | 41,8 | 58,9 |
| 92 | 23:15 | 40,7 | 60,8 |
| 93 | 23:30 | 41,1 | 58,1 |
| 94 | 23:45 | 42,5 | 57,8 |
| 95 | 00:00 | 38,8 | 56,9 |
| 96 | 00:15 | 43,2 | 57,6 |

**2.GÜN**
**23-24.09.2022**
**34.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,3 | 49,4 |
| 2 | 00:45 | 42,4 | 50,0 |
| 3 | 01:00 | 43,8 | 52,6 |
| 4 | 01:15 | 39,0 | 45,7 |
| 5 | 01:30 | 39,7 | 47,7 |
| 6 | 01:45 | 38,2 | 45,4 |
| 7 | 02:00 | 40,0 | 47,4 |
| 8 | 02:15 | 42,6 | 51,0 |
| 9 | 02:30 | 40,1 | 47,7 |
| 10 | 02:45 | 38,4 | 45,2 |
| 11 | 03:00 | 38,8 | 46,1 |
| 12 | 03:15 | 40,4 | 47,1 |
| 13 | 03:30 | 39,8 | 47,5 |
| 14 | 03:45 | 39,5 | 47,6 |
| 15 | 04:00 | 40,2 | 47,2 |
| 16 | 04:15 | 40,2 | 47,5 |
| 17 | 04:30 | 40,0 | 47,6 |
| 18 | 04:45 | 38,7 | 45,6 |
| 19 | 05:00 | 41,2 | 48,3 |
| 20 | 05:15 | 37,9 | 44,5 |
| 21 | 05:30 | 40,4 | 47,2 |
| 22 | 05:45 | 38,9 | 47,1 |
| 23 | 06:00 | 37,1 | 44,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 24 | 06:15 | 41,8 | 48,3 |
| 25 | 06:30 | 42,0 | 49,7 |
| 26 | 06:45 | 41,7 | 51,4 |
| 27 | 07:00 | 41,3 | 53,9 |
| 28 | 07:15 | 44,0 | 57,5 |
| 29 | 07:30 | 45,6 | 61,1 |
| 30 | 07:45 | 49,5 | 60,0 |
| 31 | 08:00 | 50,5 | 62,4 |
| 32 | 08:15 | 51,6 | 58,9 |
| 33 | 08:30 | 52,3 | 62,1 |
| 34 | 08:45 | 53,1 | 63,6 |
| 35 | 09:00 | 53,3 | 60,5 |
| 36 | 09:15 | 53,0 | 58,8 |
| 37 | 09:30 | 53,4 | 62,1 |
| 38 | 09:45 | 50,8 | 59,9 |
| 39 | 10:00 | 49,9 | 59,9 |
| 40 | 10:15 | 52,4 | 59,4 |
| 41 | 10:30 | 53,0 | 61,5 |
| 42 | 10:45 | 51,6 | 60,0 |
| 43 | 11:00 | 53,7 | 63,6 |
| 44 | 11:15 | 50,7 | 59,0 |
| 45 | 11:30 | 53,0 | 60,9 |
| 46 | 11:45 | 51,0 | 58,3 |
| 47 | 12:00 | 51,0 | 59,3 |
| 48 | 12:15 | 51,9 | 60,5 |
| 49 | 12:30 | 52,9 | 60,2 |
| 50 | 12:45 | 51,6 | 61,5 |
| 51 | 13:00 | 53,5 | 60,5 |
| 52 | 13:15 | 50,8 | 60,1 |
| 53 | 13:30 | 50,3 | 61,8 |
| 54 | 13:45 | 49,9 | 62,6 |
| 55 | 14:00 | 50,7 | 65,1 |
| 56 | 14:15 | 49,8 | 61,9 |
| 57 | 14:30 | 53,8 | 63,7 |
| 58 | 14:45 | 50,6 | 58,3 |
| 59 | 15:00 | 51,8 | 59,4 |
| 60 | 15:15 | 52,9 | 59,7 |
| 61 | 15:30 | 52,7 | 61,4 |
| 62 | 15:45 | 51,4 | 58,3 |
| 63 | 16:00 | 50,4 | 58,2 |
| 64 | 16:15 | 53,0 | 61,1 |
| 65 | 16:30 | 51,0 | 59,0 |
| 66 | 16:45 | 49,8 | 56,4 |
| 67 | 17:00 | 48,6 | 57,7 |
| 68 | 17:15 | 50,0 | 56,9 |
| 69 | 17:30 | 49,9 | 58,3 |
| 70 | 17:45 | 53,9 | 62,5 |
| 71 | 18:00 | 50,9 | 61,6 |
| 72 | 18:15 | 46,7 | 58,3 |
| 73 | 18:30 | 45,0 | 54,8 |
| 74 | 18:45 | 46,6 | 57,5 |
| 75 | 19:00 | 47,7 | 57,9 |
| 76 | 19:15 | 45,0 | 55,3 |
| 77 | 19:30 | 46,7 | 58,2 |
| 78 | 19:45 | 46,8 | 57,3 |
| 79 | 20:00 | 46,0 | 54,9 |
| 80 | 20:15 | 46,0 | 55,1 |
| 81 | 20:30 | 42,6 | 51,3 |
| 82 | 20:45 | 41,1 | 49,9 |
| 83 | 21:00 | 42,6 | 52,0 |
| 84 | 21:15 | 42,2 | 50,9 |
| 85 | 21:30 | 42,8 | 50,8 |
| 86 | 21:45 | 42,0 | 50,2 |
| 87 | 22:00 | 41,5 | 48,7 |
| 88 | 22:15 | 42,6 | 48,7 |
| 89 | 22:30 | 39,8 | 47,3 |
| 90 | 22:45 | 43,4 | 50,0 |
| 91 | 23:00 | 43,1 | 52,3 |
| 92 | 23:15 | 42,8 | 51,5 |
| 93 | 23:30 | 41,1 | 48,0 |
| 94 | 23:45 | 43,4 | 49,8 |
| 95 | 00:00 | 42,5 | 48,6 |
| 96 | 00:15 | 44,1 | 50,8 |

**2.GÜN**
**27-28.09.2022**
**35.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,8 | 58,9 |
| 2 | 00:45 | 37,5 | 59,8 |
| 3 | 01:00 | 39,5 | 61,7 |
| 4 | 01:15 | 40,9 | 62,0 |
| 5 | 01:30 | 43,7 | 62,9 |
| 6 | 01:45 | 43,7 | 62,8 |
| 7 | 02:00 | 42,0 | 60,5 |
| 8 | 02:15 | 43,9 | 61,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 02:30 | 40,4 | 58,4 | 53 | 13:30 | 52,0 | 66,0 |
| 10 | 02:45 | 40,8 | 59,7 | 54 | 13:45 | 52,8 | 67,5 |
| 11 | 03:00 | 41,4 | 60,4 | 55 | 14:00 | 52,0 | 67,7 |
| 12 | 03:15 | 40,3 | 59,9 | 56 | 14:15 | 50,3 | 66,9 |
| 13 | 03:30 | 41,7 | 60,2 | 57 | 14:30 | 50,0 | 68,2 |
| 14 | 03:45 | 40,6 | 59,0 | 58 | 14:45 | 52,9 | 67,8 |
| 15 | 04:00 | 40,6 | 61,2 | 59 | 15:00 | 52,8 | 69,4 |
| 16 | 04:15 | 41,3 | 59,2 | 60 | 15:15 | 52,3 | 66,7 |
| 17 | 04:30 | 40,2 | 58,3 | 61 | 15:30 | 54,6 | 67,8 |
| 18 | 04:45 | 39,6 | 56,0 | 62 | 15:45 | 53,8 | 68,7 |
| 19 | 05:00 | 42,6 | 57,7 | 63 | 16:00 | 54,6 | 70,5 |
| 20 | 05:15 | 39,4 | 58,1 | 64 | 16:15 | 54,9 | 68,7 |
| 21 | 05:30 | 41,2 | 59,8 | 65 | 16:30 | 54,3 | 66,5 |
| 22 | 05:45 | 41,9 | 59,3 | 66 | 16:45 | 51,0 | 68,1 |
| 23 | 06:00 | 37,4 | 53,3 | 67 | 17:00 | 51,3 | 68,8 |
| 24 | 06:15 | 39,8 | 58,5 | 68 | 17:15 | 52,0 | 66,3 |
| 25 | 06:30 | 40,1 | 56,8 | 69 | 17:30 | 53,3 | 69,3 |
| 26 | 06:45 | 39,8 | 58,5 | 70 | 17:45 | 53,9 | 70,5 |
| 27 | 07:00 | 44,1 | 60,7 | 71 | 18:00 | 53,3 | 69,3 |
| 28 | 07:15 | 41,5 | 57,4 | 72 | 18:15 | 47,6 | 62,9 |
| 29 | 07:30 | 40,5 | 56,0 | 73 | 18:30 | 47,0 | 64,6 |
| 30 | 07:45 | 40,8 | 56,8 | 74 | 18:45 | 43,2 | 61,8 |
| 31 | 08:00 | 40,8 | 56,9 | 75 | 19:00 | 43,0 | 62,9 |
| 32 | 08:15 | 42,5 | 57,8 | 76 | 19:15 | 38,6 | 58,7 |
| 33 | 08:30 | 43,6 | 60,3 | 77 | 19:30 | 37,8 | 57,2 |
| 34 | 08:45 | 49,1 | 64,7 | 78 | 19:45 | 40,0 | 60,6 |
| 35 | 09:00 | 50,7 | 66,9 | 79 | 20:00 | 40,1 | 61,0 |
| 36 | 09:15 | 50,3 | 67,1 | 80 | 20:15 | 39,7 | 61,8 |
| 37 | 09:30 | 50,0 | 66,9 | 81 | 20:30 | 41,1 | 63,0 |
| 38 | 09:45 | 50,3 | 67,4 | 82 | 20:45 | 43,0 | 64,1 |
| 39 | 10:00 | 49,6 | 62,1 | 83 | 21:00 | 42,4 | 63,6 |
| 40 | 10:15 | 49,4 | 64,8 | 84 | 21:15 | 43,5 | 60,6 |
| 41 | 10:30 | 49,8 | 62,9 | 85 | 21:30 | 42,5 | 59,3 |
| 42 | 10:45 | 50,0 | 65,4 | 86 | 21:45 | 43,1 | 61,1 |
| 43 | 11:00 | 50,3 | 65,4 | 87 | 22:00 | 42,2 | 61,9 |
| 44 | 11:15 | 51,5 | 66,0 | 88 | 22:15 | 43,3 | 63,8 |
| 45 | 11:30 | 52,2 | 67,0 | 89 | 22:30 | 44,0 | 63,5 |
| 46 | 11:45 | 53,0 | 68,7 | 90 | 22:45 | 42,1 | 59,4 |
| 47 | 12:00 | 50,3 | 64,2 | 91 | 23:00 | 45,5 | 63,7 |
| 48 | 12:15 | 49,9 | 65,7 | 92 | 23:15 | 45,8 | 69,0 |
| 49 | 12:30 | 51,5 | 66,5 | 93 | 23:30 | 42,7 | 61,6 |
| 50 | 12:45 | 54,9 | 68,0 | 94 | 23:45 | 42,3 | 63,0 |
| 51 | 13:00 | 53,8 | 68,6 | 95 | 00:00 | 43,6 | 62,1 |
| 52 | 13:15 | 53,9 | 70,4 | 96 | 00:15 | 44,9 | 65,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**2.GÜN**
**27-28.09.2022**
**36.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,0 | 57,0 |
| 2 | 00:45 | 38,6 | 57,8 |
| 3 | 01:00 | 40,7 | 59,7 |
| 4 | 01:15 | 42,1 | 60,0 |
| 5 | 01:30 | 42,9 | 61,8 |
| 6 | 01:45 | 42,9 | 61,7 |
| 7 | 02:00 | 43,3 | 62,4 |
| 8 | 02:15 | 43,1 | 60,3 |
| 9 | 02:30 | 40,0 | 57,8 |
| 10 | 02:45 | 40,4 | 59,0 |
| 11 | 03:00 | 41,0 | 59,7 |
| 12 | 03:15 | 39,9 | 59,2 |
| 13 | 03:30 | 40,3 | 58,2 |
| 14 | 03:45 | 39,2 | 57,0 |
| 15 | 04:00 | 39,2 | 59,1 |
| 16 | 04:15 | 39,9 | 57,2 |
| 17 | 04:30 | 38,9 | 56,3 |
| 18 | 04:45 | 40,9 | 57,8 |
| 19 | 05:00 | 41,8 | 56,6 |
| 20 | 05:15 | 40,3 | 59,3 |
| 21 | 05:30 | 40,4 | 58,7 |
| 22 | 05:45 | 41,1 | 58,2 |
| 23 | 06:00 | 38,2 | 54,4 |
| 24 | 06:15 | 38,5 | 56,6 |
| 25 | 06:30 | 38,8 | 54,9 |
| 26 | 06:45 | 38,5 | 56,6 |
| 27 | 07:00 | 42,7 | 58,7 |
| 28 | 07:15 | 43,7 | 60,5 |
| 29 | 07:30 | 42,7 | 59,0 |
| 30 | 07:45 | 43,0 | 59,8 |
| 31 | 08:00 | 43,0 | 59,9 |
| 32 | 08:15 | 44,8 | 60,9 |
| 33 | 08:30 | 45,9 | 63,5 |
| 34 | 08:45 | 51,8 | 68,1 |
| 35 | 09:00 | 53,4 | 70,5 |
| 36 | 09:15 | 53,0 | 70,7 |
| 37 | 09:30 | 52,8 | 70,5 |
| 38 | 09:45 | 53,0 | 71,0 |
| 39 | 10:00 | 52,4 | 65,4 |
| 40 | 10:15 | 52,1 | 68,3 |
| 41 | 10:30 | 52,6 | 66,2 |
| 42 | 10:45 | 52,8 | 68,9 |
| 43 | 11:00 | 53,0 | 68,9 |
| 44 | 11:15 | 54,2 | 69,5 |
| 45 | 11:30 | 55,0 | 70,6 |
| 46 | 11:45 | 55,8 | 72,4 |
| 47 | 12:00 | 53,0 | 67,6 |
| 48 | 12:15 | 52,7 | 69,2 |
| 49 | 12:30 | 54,2 | 70,0 |
| 50 | 12:45 | 57,8 | 71,6 |
| 51 | 13:00 | 56,7 | 72,2 |
| 52 | 13:15 | 56,8 | 74,1 |
| 53 | 13:30 | 54,8 | 69,5 |
| 54 | 13:45 | 55,6 | 71,1 |
| 55 | 14:00 | 54,8 | 71,3 |
| 56 | 14:15 | 53,0 | 70,5 |
| 57 | 14:30 | 52,8 | 71,8 |
| 58 | 14:45 | 55,7 | 71,4 |
| 59 | 15:00 | 55,6 | 73,1 |
| 60 | 15:15 | 55,1 | 70,2 |
| 61 | 15:30 | 57,5 | 71,4 |
| 62 | 15:45 | 56,7 | 72,4 |
| 63 | 16:00 | 57,5 | 74,2 |
| 64 | 16:15 | 57,8 | 72,4 |
| 65 | 16:30 | 57,2 | 70,0 |
| 66 | 16:45 | 53,7 | 71,7 |
| 67 | 17:00 | 54,0 | 72,5 |
| 68 | 17:15 | 54,8 | 69,8 |
| 69 | 17:30 | 56,1 | 73,0 |
| 70 | 17:45 | 56,8 | 74,3 |
| 71 | 18:00 | 56,1 | 73,0 |
| 72 | 18:15 | 50,3 | 66,3 |
| 73 | 18:30 | 49,5 | 68,0 |
| 74 | 18:45 | 45,5 | 65,1 |
| 75 | 19:00 | 45,3 | 66,3 |
| 76 | 19:15 | 40,7 | 61,8 |
| 77 | 19:30 | 39,8 | 60,2 |
| 78 | 19:45 | 42,2 | 63,8 |
| 79 | 20:00 | 42,3 | 64,2 |
| 80 | 20:15 | 41,8 | 65,1 |
| 81 | 20:30 | 41,8 | 64,0 |
| 82 | 20:45 | 42,2 | 62,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 41,6 | 62,3 |
| 84 | 21:15 | 42,7 | 59,4 |
| 85 | 21:30 | 41,7 | 58,1 |
| 86 | 21:45 | 42,1 | 59,7 |
| 87 | 22:00 | 41,3 | 60,5 |
| 88 | 22:15 | 42,3 | 62,4 |
| 89 | 22:30 | 43,0 | 62,1 |
| 90 | 22:45 | 41,2 | 58,1 |
| 91 | 23:00 | 44,5 | 62,3 |
| 92 | 23:15 | 44,8 | 67,4 |
| 93 | 23:30 | 44,5 | 64,2 |
| 94 | 23:45 | 44,1 | 65,7 |
| 95 | 00:00 | 45,5 | 64,7 |
| 96 | 00:15 | 43,9 | 64,0 |

**2.GÜN**
**27-28.09.2022**
**37.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,3 | 61,4 |
| 2 | 00:45 | 41,2 | 60,9 |
| 3 | 01:00 | 42,8 | 63,8 |
| 4 | 01:15 | 43,0 | 66,1 |
| 5 | 01:30 | 43,5 | 62,4 |
| 6 | 01:45 | 43,2 | 66,2 |
| 7 | 02:00 | 42,6 | 57,9 |
| 8 | 02:15 | 42,0 | 65,5 |
| 9 | 02:30 | 42,6 | 61,0 |
| 10 | 02:45 | 42,9 | 63,7 |
| 11 | 03:00 | 43,1 | 57,7 |
| 12 | 03:15 | 43,2 | 61,1 |
| 13 | 03:30 | 43,6 | 64,5 |
| 14 | 03:45 | 43,2 | 66,8 |
| 15 | 04:00 | 43,4 | 62,3 |
| 16 | 04:15 | 43,6 | 64,4 |
| 17 | 04:30 | 43,1 | 66,2 |
| 18 | 04:45 | 41,8 | 63,8 |
| 19 | 05:00 | 41,0 | 58,1 |
| 20 | 05:15 | 40,5 | 57,7 |
| 21 | 05:30 | 40,2 | 55,6 |
| 22 | 05:45 | 38,4 | 55,2 |
| 23 | 06:00 | 37,9 | 57,9 |
| 24 | 06:15 | 37,4 | 54,0 |
| 25 | 06:30 | 39,2 | 55,1 |
| 26 | 06:45 | 38,9 | 52,0 |
| 27 | 07:00 | 39,1 | 54,8 |
| 28 | 07:15 | 38,6 | 51,4 |
| 29 | 07:30 | 41,7 | 53,2 |
| 30 | 07:45 | 44,2 | 53,7 |
| 31 | 08:00 | 45,6 | 50,9 |
| 32 | 08:15 | 47,1 | 53,2 |
| 33 | 08:30 | 47,0 | 50,8 |
| 34 | 08:45 | 47,7 | 52,8 |
| 35 | 09:00 | 48,1 | 54,0 |
| 36 | 09:15 | 48,3 | 55,8 |
| 37 | 09:30 | 48,7 | 57,3 |
| 38 | 09:45 | 49,1 | 54,0 |
| 39 | 10:00 | 50,5 | 56,5 |
| 40 | 10:15 | 50,3 | 53,0 |
| 41 | 10:30 | 50,8 | 56,1 |
| 42 | 10:45 | 51,5 | 53,8 |
| 43 | 11:00 | 49,0 | 56,0 |
| 44 | 11:15 | 50,7 | 56,6 |
| 45 | 11:30 | 50,3 | 58,3 |
| 46 | 11:45 | 51,5 | 55,1 |
| 47 | 12:00 | 51,3 | 53,3 |
| 48 | 12:15 | 51,8 | 55,3 |
| 49 | 12:30 | 51,9 | 56,7 |
| 50 | 12:45 | 52,1 | 57,3 |
| 51 | 13:00 | 51,6 | 58,9 |
| 52 | 13:15 | 51,9 | 56,0 |
| 53 | 13:30 | 50,8 | 54,6 |
| 54 | 13:45 | 50,4 | 56,9 |
| 55 | 14:00 | 50,6 | 53,7 |
| 56 | 14:15 | 49,7 | 56,1 |
| 57 | 14:30 | 47,2 | 53,1 |
| 58 | 14:45 | 48,7 | 54,6 |
| 59 | 15:00 | 49,1 | 56,6 |
| 60 | 15:15 | 49,0 | 56,0 |
| 61 | 15:30 | 49,2 | 53,4 |
| 62 | 15:45 | 48,9 | 52,0 |
| 63 | 16:00 | 49,4 | 56,0 |
| 64 | 16:15 | 49,0 | 53,8 |
| 65 | 16:30 | 49,0 | 55,2 |
| 66 | 16:45 | 49,6 | 54,3 |
| 67 | 17:00 | 50,4 | 55,1 |
| 68 | 17:15 | 49,9 | 52,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 69 | 17:30 | 48,7 | 55,3 |
| 70 | 17:45 | 48,9 | 56,5 |
| 71 | 18:00 | 49,2 | 57,5 |
| 72 | 18:15 | 49,0 | 57,0 |
| 73 | 18:30 | 49,3 | 61,6 |
| 74 | 18:45 | 50,5 | 61,0 |
| 75 | 19:00 | 49,9 | 59,0 |
| 76 | 19:15 | 48,2 | 54,4 |
| 77 | 19:30 | 50,2 | 60,1 |
| 78 | 19:45 | 49,9 | 61,6 |
| 79 | 20:00 | 51,3 | 56,5 |
| 80 | 20:15 | 44,3 | 57,9 |
| 81 | 20:30 | 41,6 | 59,6 |
| 82 | 20:45 | 39,3 | 56,0 |
| 83 | 21:00 | 38,7 | 50,5 |
| 84 | 21:15 | 39,4 | 52,4 |
| 85 | 21:30 | 39,8 | 54,3 |
| 86 | 21:45 | 39,2 | 53,8 |
| 87 | 22:00 | 39,2 | 52,3 |
| 88 | 22:15 | 39,3 | 52,9 |
| 89 | 22:30 | 39,4 | 54,6 |
| 90 | 22:45 | 38,5 | 56,0 |
| 91 | 23:00 | 39,2 | 53,9 |
| 92 | 23:15 | 38,9 | 52,2 |
| 93 | 23:30 | 36,8 | 54,8 |
| 94 | 23:45 | 36,0 | 52,1 |
| 95 | 00:00 | 37,1 | 55,3 |
| 96 | 00:15 | 35,6 | 52,6 |

**2.GÜN**
**27-28.09.2022**
**38.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,5 | 50,0 |
| 2 | 00:45 | 40,7 | 52,6 |
| 3 | 01:00 | 42,3 | 55,1 |
| 4 | 01:15 | 40,1 | 49,2 |
| 5 | 01:30 | 42,1 | 54,5 |
| 6 | 01:45 | 40,2 | 51,1 |
| 7 | 02:00 | 40,1 | 52,3 |
| 8 | 02:15 | 42,1 | 56,4 |
| 9 | 02:30 | 40,4 | 50,9 |
| 10 | 02:45 | 39,4 | 51,5 |
| 11 | 03:00 | 40,1 | 53,1 |
| 12 | 03:15 | 42,1 | 53,0 |
| 13 | 03:30 | 38,7 | 51,2 |
| 14 | 03:45 | 38,0 | 51,9 |
| 15 | 04:00 | 38,1 | 50,6 |
| 16 | 04:15 | 37,4 | 50,8 |
| 17 | 04:30 | 37,5 | 50,1 |
| 18 | 04:45 | 37,4 | 52,0 |
| 19 | 05:00 | 39,1 | 51,0 |
| 20 | 05:15 | 39,4 | 51,4 |
| 21 | 05:30 | 38,9 | 50,2 |
| 22 | 05:45 | 37,5 | 48,2 |
| 23 | 06:00 | 37,4 | 49,3 |
| 24 | 06:15 | 40,6 | 52,1 |
| 25 | 06:30 | 40,8 | 52,5 |
| 26 | 06:45 | 40,6 | 53,8 |
| 27 | 07:00 | 40,2 | 52,4 |
| 28 | 07:15 | 42,8 | 55,9 |
| 29 | 07:30 | 44,4 | 59,4 |
| 30 | 07:45 | 48,2 | 58,3 |
| 31 | 08:00 | 49,0 | 60,7 |
| 32 | 08:15 | 50,1 | 57,2 |
| 33 | 08:30 | 50,8 | 60,4 |
| 34 | 08:45 | 51,6 | 61,8 |
| 35 | 09:00 | 51,8 | 58,8 |
| 36 | 09:15 | 51,5 | 57,1 |
| 37 | 09:30 | 51,9 | 60,4 |
| 38 | 09:45 | 49,3 | 58,2 |
| 39 | 10:00 | 48,6 | 58,2 |
| 40 | 10:15 | 50,9 | 57,7 |
| 41 | 10:30 | 51,5 | 59,8 |
| 42 | 10:45 | 50,1 | 58,3 |
| 43 | 11:00 | 52,2 | 61,8 |
| 44 | 11:15 | 49,2 | 57,3 |
| 45 | 11:30 | 51,5 | 59,2 |
| 46 | 11:45 | 49,5 | 56,7 |
| 47 | 12:00 | 49,5 | 57,6 |
| 48 | 12:15 | 50,4 | 58,8 |
| 49 | 12:30 | 51,4 | 58,5 |
| 50 | 12:45 | 50,1 | 60,1 |
| 51 | 13:00 | 52,0 | 58,8 |
| 52 | 13:15 | 49,3 | 58,4 |
| 53 | 13:30 | 48,8 | 60,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 54 | 13:45 | 48,6 | 60,9 |
| 55 | 14:00 | 49,2 | 63,3 |
| 56 | 14:15 | 48,5 | 60,2 |
| 57 | 14:30 | 52,3 | 61,9 |
| 58 | 14:45 | 50,9 | 61,5 |
| 59 | 15:00 | 48,6 | 58,8 |
| 60 | 15:15 | 47,1 | 56,8 |
| 61 | 15:30 | 47,1 | 58,7 |
| 62 | 15:45 | 44,7 | 59,8 |
| 63 | 16:00 | 46,4 | 61,0 |
| 64 | 16:15 | 46,8 | 59,4 |
| 65 | 16:30 | 46,1 | 58,2 |
| 66 | 16:45 | 46,8 | 58,9 |
| 67 | 17:00 | 46,7 | 58,4 |
| 68 | 17:15 | 49,1 | 59,8 |
| 69 | 17:30 | 48,9 | 58,0 |
| 70 | 17:45 | 50,4 | 57,4 |
| 71 | 18:00 | 46,2 | 60,7 |
| 72 | 18:15 | 48,3 | 62,1 |
| 73 | 18:30 | 49,1 | 58,9 |
| 74 | 18:45 | 48,0 | 58,9 |
| 75 | 19:00 | 51,1 | 60,6 |
| 76 | 19:15 | 49,2 | 60,7 |
| 77 | 19:30 | 48,3 | 62,1 |
| 78 | 19:45 | 47,8 | 60,0 |
| 79 | 20:00 | 48,9 | 60,4 |
| 80 | 20:15 | 49,0 | 63,3 |
| 81 | 20:30 | 45,5 | 56,3 |
| 82 | 20:45 | 44,9 | 55,1 |
| 83 | 21:00 | 47,1 | 60,9 |
| 84 | 21:15 | 45,0 | 58,1 |
| 85 | 21:30 | 44,4 | 58,0 |
| 86 | 21:45 | 43,5 | 58,4 |
| 87 | 22:00 | 41,7 | 54,2 |
| 88 | 22:15 | 43,0 | 57,2 |
| 89 | 22:30 | 41,3 | 55,4 |
| 90 | 22:45 | 43,5 | 56,5 |
| 91 | 23:00 | 41,8 | 52,5 |
| 92 | 23:15 | 40,8 | 55,0 |
| 93 | 23:30 | 41,7 | 53,7 |
| 94 | 23:45 | 40,9 | 55,2 |
| 95 | 00:00 | 40,5 | 50,9 |
| 96 | 00:15 | 42,0 | 53,2 |

**2.GÜN**
**27-28.09.2022**
**39.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,7 | 56,7 |
| 2 | 00:45 | 42,8 | 55,0 |
| 3 | 01:00 | 43,6 | 57,8 |
| 4 | 01:15 | 45,0 | 62,9 |
| 5 | 01:30 | 45,4 | 59,2 |
| 6 | 01:45 | 45,1 | 57,8 |
| 7 | 02:00 | 44,5 | 55,0 |
| 8 | 02:15 | 43,9 | 62,4 |
| 9 | 02:30 | 41,2 | 55,1 |
| 10 | 02:45 | 42,7 | 57,7 |
| 11 | 03:00 | 42,8 | 52,3 |
| 12 | 03:15 | 42,5 | 54,7 |
| 13 | 03:30 | 42,9 | 57,8 |
| 14 | 03:45 | 42,5 | 59,9 |
| 15 | 04:00 | 42,7 | 55,9 |
| 16 | 04:15 | 42,9 | 57,7 |
| 17 | 04:30 | 42,4 | 59,3 |
| 18 | 04:45 | 45,8 | 60,2 |
| 19 | 05:00 | 45,3 | 55,2 |
| 20 | 05:15 | 44,8 | 54,9 |
| 21 | 05:30 | 44,3 | 52,9 |
| 22 | 05:45 | 42,5 | 52,4 |
| 23 | 06:00 | 39,9 | 52,4 |
| 24 | 06:15 | 39,3 | 49,0 |
| 25 | 06:30 | 41,3 | 49,7 |
| 26 | 06:45 | 41,1 | 46,9 |
| 27 | 07:00 | 42,8 | 56,9 |
| 28 | 07:15 | 42,3 | 53,2 |
| 29 | 07:30 | 45,7 | 55,0 |
| 30 | 07:45 | 49,3 | 55,6 |
| 31 | 08:00 | 49,5 | 52,2 |
| 32 | 08:15 | 48,3 | 54,5 |
| 33 | 08:30 | 48,7 | 52,1 |
| 34 | 08:45 | 48,0 | 54,7 |
| 35 | 09:00 | 47,8 | 56,0 |
| 36 | 09:15 | 49,9 | 57,9 |
| 37 | 09:30 | 50,5 | 60,5 |
| 38 | 09:45 | 49,3 | 61,7 |


rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 39 | 10:00 | 50,2 | 63,0 |
| 40 | 10:15 | 49,8 | 61,1 |
| 41 | 10:30 | 50,5 | 61,6 |
| 42 | 10:45 | 51,1 | 60,5 |
| 43 | 11:00 | 53,0 | 62,0 |
| 44 | 11:15 | 51,2 | 62,4 |
| 45 | 11:30 | 52,1 | 64,0 |
| 46 | 11:45 | 53,3 | 60,9 |
| 47 | 12:00 | 51,3 | 61,5 |
| 48 | 12:15 | 52,2 | 60,8 |
| 49 | 12:30 | 52,3 | 57,0 |
| 50 | 12:45 | 52,5 | 57,5 |
| 51 | 13:00 | 51,9 | 59,2 |
| 52 | 13:15 | 50,9 | 58,1 |
| 53 | 13:30 | 50,6 | 56,5 |
| 54 | 13:45 | 52,2 | 58,9 |
| 55 | 14:00 | 50,5 | 55,6 |
| 56 | 14:15 | 51,6 | 58,3 |
| 57 | 14:30 | 50,2 | 55,0 |
| 58 | 14:45 | 50,5 | 56,5 |
| 59 | 15:00 | 50,9 | 58,7 |
| 60 | 15:15 | 50,9 | 58,1 |
| 61 | 15:30 | 51,1 | 55,1 |
| 62 | 15:45 | 50,8 | 53,9 |
| 63 | 16:00 | 51,3 | 58,1 |
| 64 | 16:15 | 50,9 | 55,8 |
| 65 | 16:30 | 49,4 | 55,3 |
| 66 | 16:45 | 49,8 | 54,6 |
| 67 | 17:00 | 50,6 | 55,3 |
| 68 | 17:15 | 50,3 | 60,5 |
| 69 | 17:30 | 50,5 | 57,3 |
| 70 | 17:45 | 50,8 | 58,6 |
| 71 | 18:00 | 51,1 | 59,6 |
| 72 | 18:15 | 50,9 | 59,0 |
| 73 | 18:30 | 51,2 | 63,9 |
| 74 | 18:45 | 52,3 | 63,3 |
| 75 | 19:00 | 51,8 | 61,2 |
| 76 | 19:15 | 49,3 | 60,5 |
| 77 | 19:30 | 49,7 | 60,0 |
| 78 | 19:45 | 51,8 | 63,9 |
| 79 | 20:00 | 53,0 | 58,6 |
| 80 | 20:15 | 45,8 | 60,1 |
| 81 | 20:30 | 45,5 | 61,7 |
| 82 | 20:45 | 46,6 | 58,1 |
| 83 | 21:00 | 45,7 | 52,3 |
| 84 | 21:15 | 44,9 | 52,7 |
| 85 | 21:30 | 43,0 | 54,6 |
| 86 | 21:45 | 44,0 | 54,2 |
| 87 | 22:00 | 43,0 | 52,6 |
| 88 | 22:15 | 46,8 | 54,8 |
| 89 | 22:30 | 44,5 | 56,5 |
| 90 | 22:45 | 41,7 | 57,4 |
| 91 | 23:00 | 42,4 | 55,1 |
| 92 | 23:15 | 43,9 | 55,4 |
| 93 | 23:30 | 41,4 | 58,5 |
| 94 | 23:45 | 41,4 | 55,4 |
| 95 | 00:00 | 42,4 | 58,8 |
| 96 | 00:15 | 42,5 | 59,8 |

**2.GÜN**
**27-28.09.2022**
**40.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,8 | 60,5 |
| 2 | 00:45 | 39,8 | 60,0 |
| 3 | 01:00 | 41,6 | 55,6 |
| 4 | 01:15 | 39,2 | 56,3 |
| 5 | 01:30 | 43,4 | 52,4 |
| 6 | 01:45 | 42,3 | 50,9 |
| 7 | 02:00 | 40,6 | 49,7 |
| 8 | 02:15 | 43,7 | 53,7 |
| 9 | 02:30 | 40,0 | 53,0 |
| 10 | 02:45 | 39,0 | 50,9 |
| 11 | 03:00 | 38,9 | 45,3 |
| 12 | 03:15 | 41,0 | 45,8 |
| 13 | 03:30 | 41,8 | 48,0 |
| 14 | 03:45 | 41,6 | 48,1 |
| 15 | 04:00 | 41,3 | 47,4 |
| 16 | 04:15 | 40,9 | 47,4 |
| 17 | 04:30 | 42,3 | 48,0 |
| 18 | 04:45 | 39,8 | 45,8 |
| 19 | 05:00 | 43,1 | 49,7 |
| 20 | 05:15 | 40,1 | 46,3 |
| 21 | 05:30 | 41,7 | 47,1 |
| 22 | 05:45 | 39,4 | 46,4 |
| 23 | 06:00 | 38,5 | 44,9 |
| 24 | 06:15 | 39,4 | 45,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 25 | 06:30 | 42,3 | 50,0 |
| 26 | 06:45 | 41,4 | 47,2 |
| 27 | 07:00 | 41,9 | 49,7 |
| 28 | 07:15 | 44,1 | 50,3 |
| 29 | 07:30 | 44,3 | 51,2 |
| 30 | 07:45 | 46,2 | 51,0 |
| 31 | 08:00 | 46,1 | 51,9 |
| 32 | 08:15 | 47,1 | 52,1 |
| 33 | 08:30 | 45,3 | 52,8 |
| 34 | 08:45 | 45,0 | 53,6 |
| 35 | 09:00 | 46,2 | 54,4 |
| 36 | 09:15 | 46,6 | 55,3 |
| 37 | 09:30 | 47,9 | 54,8 |
| 38 | 09:45 | 46,2 | 54,0 |
| 39 | 10:00 | 44,3 | 54,9 |
| 40 | 10:15 | 46,9 | 58,0 |
| 41 | 10:30 | 48,8 | 57,8 |
| 42 | 10:45 | 49,3 | 55,5 |
| 43 | 11:00 | 47,6 | 55,4 |
| 44 | 11:15 | 48,7 | 57,8 |
| 45 | 11:30 | 48,0 | 59,5 |
| 46 | 11:45 | 46,9 | 59,5 |
| 47 | 12:00 | 49,7 | 55,9 |
| 48 | 12:15 | 48,5 | 58,0 |
| 49 | 12:30 | 49,6 | 59,9 |
| 50 | 12:45 | 51,4 | 58,1 |
| 51 | 13:00 | 52,9 | 58,2 |
| 52 | 13:15 | 53,7 | 59,7 |
| 53 | 13:30 | 51,8 | 62,0 |
| 54 | 13:45 | 51,4 | 61,7 |
| 55 | 14:00 | 54,2 | 59,8 |
| 56 | 14:15 | 53,9 | 59,2 |
| 57 | 14:30 | 52,8 | 62,2 |
| 58 | 14:45 | 51,5 | 60,3 |
| 59 | 15:00 | 52,4 | 62,4 |
| 60 | 15:15 | 52,6 | 63,5 |
| 61 | 15:30 | 52,5 | 63,0 |
| 62 | 15:45 | 53,8 | 60,9 |
| 63 | 16:00 | 52,1 | 62,0 |
| 64 | 16:15 | 51,8 | 63,6 |
| 65 | 16:30 | 52,0 | 64,7 |
| 66 | 16:45 | 51,8 | 65,3 |
| 67 | 17:00 | 53,4 | 64,0 |
| 68 | 17:15 | 53,9 | 63,1 |
| 69 | 17:30 | 52,3 | 61,9 |
| 70 | 17:45 | 51,7 | 63,1 |
| 71 | 18:00 | 53,7 | 62,0 |
| 72 | 18:15 | 49,5 | 63,7 |
| 73 | 18:30 | 47,4 | 62,8 |
| 74 | 18:45 | 48,3 | 62,1 |
| 75 | 19:00 | 49,5 | 63,0 |
| 76 | 19:15 | 48,2 | 59,0 |
| 77 | 19:30 | 50,6 | 57,2 |
| 78 | 19:45 | 52,1 | 59,4 |
| 79 | 20:00 | 49,6 | 55,5 |
| 80 | 20:15 | 49,0 | 55,3 |
| 81 | 20:30 | 45,6 | 56,4 |
| 82 | 20:45 | 45,1 | 55,9 |
| 83 | 21:00 | 46,0 | 58,0 |
| 84 | 21:15 | 43,7 | 57,1 |
| 85 | 21:30 | 45,2 | 54,4 |
| 86 | 21:45 | 45,4 | 56,0 |
| 87 | 22:00 | 43,3 | 53,7 |
| 88 | 22:15 | 44,4 | 53,1 |
| 89 | 22:30 | 42,2 | 49,9 |
| 90 | 22:45 | 45,5 | 52,7 |
| 91 | 23:00 | 46,3 | 54,7 |
| 92 | 23:15 | 46,3 | 53,8 |
| 93 | 23:30 | 43,3 | 55,3 |
| 94 | 23:45 | 43,7 | 54,8 |
| 95 | 00:00 | 41,3 | 48,5 |
| 96 | 00:15 | 43,7 | 53,4 |

**2.GÜN**
**27-28.09.2022**
**41.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,1 | 55,1 |
| 2 | 00:45 | 38,2 | 54,9 |
| 3 | 01:00 | 38,8 | 54,6 |
| 4 | 01:15 | 40,0 | 59,9 |
| 5 | 01:30 | 39,9 | 58,4 |
| 6 | 01:45 | 39,9 | 59,3 |
| 7 | 02:00 | 40,3 | 61,1 |
| 8 | 02:15 | 40,2 | 58,6 |
| 9 | 02:30 | 37,4 | 57,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 10 | 02:45 | 37,7 | 56,8 |
| 11 | 03:00 | 38,2 | 56,6 |
| 12 | 03:15 | 37,3 | 58,1 |
| 13 | 03:30 | 37,6 | 57,0 |
| 14 | 03:45 | 36,1 | 56,6 |
| 15 | 04:00 | 36,2 | 57,9 |
| 16 | 04:15 | 36,8 | 56,9 |
| 17 | 04:30 | 35,9 | 53,9 |
| 18 | 04:45 | 37,6 | 58,7 |
| 19 | 05:00 | 38,3 | 58,0 |
| 20 | 05:15 | 37,9 | 57,3 |
| 21 | 05:30 | 38,1 | 59,8 |
| 22 | 05:45 | 38,7 | 56,6 |
| 23 | 06:00 | 36,1 | 55,8 |
| 24 | 06:15 | 36,3 | 53,7 |
| 25 | 06:30 | 36,7 | 54,6 |
| 26 | 06:45 | 36,3 | 53,8 |
| 27 | 07:00 | 40,6 | 57,8 |
| 28 | 07:15 | 41,8 | 59,5 |
| 29 | 07:30 | 41,6 | 58,0 |
| 30 | 07:45 | 42,5 | 58,9 |
| 31 | 08:00 | 42,0 | 60,5 |
| 32 | 08:15 | 46,4 | 64,4 |
| 33 | 08:30 | 46,8 | 66,9 |
| 34 | 08:45 | 51,6 | 65,5 |
| 35 | 09:00 | 52,0 | 66,2 |
| 36 | 09:15 | 52,3 | 64,5 |
| 37 | 09:30 | 52,5 | 66,8 |
| 38 | 09:45 | 52,6 | 66,0 |
| 39 | 10:00 | 50,2 | 65,1 |
| 40 | 10:15 | 51,0 | 67,4 |
| 41 | 10:30 | 50,2 | 66,5 |
| 42 | 10:45 | 51,0 | 68,3 |
| 43 | 11:00 | 50,9 | 66,8 |
| 44 | 11:15 | 50,2 | 64,4 |
| 45 | 11:30 | 51,2 | 66,0 |
| 46 | 11:45 | 52,2 | 67,4 |
| 47 | 12:00 | 49,7 | 63,8 |
| 48 | 12:15 | 48,6 | 67,5 |
| 49 | 12:30 | 49,8 | 64,9 |
| 50 | 12:45 | 52,5 | 66,5 |
| 51 | 13:00 | 53,8 | 65,5 |
| 52 | 13:15 | 55,1 | 69,5 |
| 53 | 13:30 | 50,8 | 65,1 |
| 54 | 13:45 | 50,5 | 62,8 |
| 55 | 14:00 | 49,8 | 65,9 |
| 56 | 14:15 | 50,3 | 63,7 |
| 57 | 14:30 | 50,4 | 65,1 |
| 58 | 14:45 | 49,8 | 65,5 |
| 59 | 15:00 | 51,8 | 63,4 |
| 60 | 15:15 | 51,1 | 65,4 |
| 61 | 15:30 | 51,8 | 64,9 |
| 62 | 15:45 | 50,4 | 64,8 |
| 63 | 16:00 | 51,6 | 64,4 |
| 64 | 16:15 | 50,2 | 65,1 |
| 65 | 16:30 | 48,7 | 63,6 |
| 66 | 16:45 | 49,5 | 63,2 |
| 67 | 17:00 | 49,6 | 65,1 |
| 68 | 17:15 | 50,3 | 64,3 |
| 69 | 17:30 | 49,9 | 65,5 |
| 70 | 17:45 | 49,0 | 64,0 |
| 71 | 18:00 | 48,7 | 65,4 |
| 72 | 18:15 | 44,3 | 65,9 |
| 73 | 18:30 | 42,9 | 66,3 |
| 74 | 18:45 | 40,0 | 62,4 |
| 75 | 19:00 | 41,4 | 63,3 |
| 76 | 19:15 | 37,5 | 59,7 |
| 77 | 19:30 | 37,6 | 59,7 |
| 78 | 19:45 | 39,8 | 63,3 |
| 79 | 20:00 | 39,2 | 63,9 |
| 80 | 20:15 | 38,7 | 61,9 |
| 81 | 20:30 | 38,6 | 62,8 |
| 82 | 20:45 | 39,0 | 63,9 |
| 83 | 21:00 | 38,5 | 62,1 |
| 84 | 21:15 | 37,9 | 59,1 |
| 85 | 21:30 | 37,0 | 59,8 |
| 86 | 21:45 | 39,0 | 59,6 |
| 87 | 22:00 | 38,2 | 58,4 |
| 88 | 22:15 | 39,2 | 62,1 |
| 89 | 22:30 | 39,9 | 62,8 |
| 90 | 22:45 | 38,5 | 58,4 |
| 91 | 23:00 | 41,2 | 56,6 |
| 92 | 23:15 | 44,3 | 62,2 |
| 93 | 23:30 | 41,8 | 61,1 |
| 94 | 23:45 | 41,0 | 60,2 |
| 95 | 00:00 | 40,6 | 62,6 |
| 96 | 00:15 | 39,4 | 61,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**2.GÜN**
**27-28.09.2022**
**42.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 43,9 | 64,2 |
| 2 | 00:45 | 44,3 | 63,7 |
| 3 | 01:00 | 44,9 | 66,8 |
| 4 | 01:15 | 47,2 | 63,9 |
| 5 | 01:30 | 47,9 | 68,6 |
| 6 | 01:45 | 47,5 | 64,8 |
| 7 | 02:00 | 46,8 | 63,6 |
| 8 | 02:15 | 46,3 | 63,5 |
| 9 | 02:30 | 44,7 | 63,8 |
| 10 | 02:45 | 44,9 | 66,7 |
| 11 | 03:00 | 45,1 | 60,3 |
| 12 | 03:15 | 44,9 | 63,3 |
| 13 | 03:30 | 45,2 | 66,9 |
| 14 | 03:45 | 44,9 | 65,2 |
| 15 | 04:00 | 45,0 | 62,5 |
| 16 | 04:15 | 45,2 | 61,7 |
| 17 | 04:30 | 44,8 | 60,6 |
| 18 | 04:45 | 45,6 | 65,1 |
| 19 | 05:00 | 45,0 | 63,8 |
| 20 | 05:15 | 44,7 | 59,7 |
| 21 | 05:30 | 44,3 | 57,9 |
| 22 | 05:45 | 42,2 | 60,8 |
| 23 | 06:00 | 39,7 | 54,6 |
| 24 | 06:15 | 39,1 | 56,4 |
| 25 | 06:30 | 41,2 | 57,7 |
| 26 | 06:45 | 40,6 | 54,3 |
| 27 | 07:00 | 42,5 | 59,8 |
| 28 | 07:15 | 42,0 | 56,0 |
| 29 | 07:30 | 45,5 | 58,0 |
| 30 | 07:45 | 48,3 | 58,5 |
| 31 | 08:00 | 49,2 | 55,0 |
| 32 | 08:15 | 50,8 | 57,3 |
| 33 | 08:30 | 50,7 | 54,9 |
| 34 | 08:45 | 52,1 | 57,4 |
| 35 | 09:00 | 52,4 | 58,8 |
| 36 | 09:15 | 52,6 | 60,8 |
| 37 | 09:30 | 53,0 | 62,5 |
| 38 | 09:45 | 53,6 | 58,8 |
| 39 | 10:00 | 52,8 | 59,1 |
| 40 | 10:15 | 52,6 | 59,4 |
| 41 | 10:30 | 53,1 | 61,5 |
| 42 | 10:45 | 53,8 | 62,5 |
| 43 | 11:00 | 53,5 | 61,0 |
| 44 | 11:15 | 55,3 | 61,6 |
| 45 | 11:30 | 54,9 | 63,5 |
| 46 | 11:45 | 56,1 | 60,1 |
| 47 | 12:00 | 54,1 | 61,7 |
| 48 | 12:15 | 54,8 | 62,5 |
| 49 | 12:30 | 54,9 | 59,9 |
| 50 | 12:45 | 55,1 | 60,6 |
| 51 | 13:00 | 54,6 | 62,4 |
| 52 | 13:15 | 56,4 | 61,0 |
| 53 | 13:30 | 55,4 | 59,6 |
| 54 | 13:45 | 55,0 | 62,0 |
| 55 | 14:00 | 55,2 | 58,5 |
| 56 | 14:15 | 54,2 | 61,1 |
| 57 | 14:30 | 51,5 | 57,9 |
| 58 | 14:45 | 53,0 | 59,6 |
| 59 | 15:00 | 53,6 | 61,6 |
| 60 | 15:15 | 53,5 | 61,0 |
| 61 | 15:30 | 53,7 | 58,2 |
| 62 | 15:45 | 53,2 | 56,5 |
| 63 | 16:00 | 53,9 | 61,0 |
| 64 | 16:15 | 53,5 | 58,6 |
| 65 | 16:30 | 51,9 | 58,5 |
| 66 | 16:45 | 52,5 | 57,4 |
| 67 | 17:00 | 53,2 | 58,4 |
| 68 | 17:15 | 52,8 | 60,0 |
| 69 | 17:30 | 53,0 | 61,7 |
| 70 | 17:45 | 53,2 | 61,5 |
| 71 | 18:00 | 53,7 | 62,7 |
| 72 | 18:15 | 53,4 | 62,1 |
| 73 | 18:30 | 53,8 | 64,8 |
| 74 | 18:45 | 55,1 | 65,6 |
| 75 | 19:00 | 54,6 | 63,4 |
| 76 | 19:15 | 50,4 | 61,7 |
| 77 | 19:30 | 52,5 | 63,0 |
| 78 | 19:45 | 54,6 | 67,1 |
| 79 | 20:00 | 55,9 | 61,5 |
| 80 | 20:15 | 48,4 | 59,4 |
| 81 | 20:30 | 45,3 | 58,0 |
| 82 | 20:45 | 42,9 | 61,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 42,1 | 55,1 |
| 84 | 21:15 | 41,7 | 55,4 |
| 85 | 21:30 | 42,1 | 57,4 |
| 86 | 21:45 | 41,4 | 56,8 |
| 87 | 22:00 | 41,5 | 55,3 |
| 88 | 22:15 | 42,9 | 57,5 |
| 89 | 22:30 | 43,0 | 59,6 |
| 90 | 22:45 | 40,2 | 60,2 |
| 91 | 23:00 | 41,1 | 58,0 |
| 92 | 23:15 | 42,3 | 58,5 |
| 93 | 23:30 | 40,0 | 61,4 |
| 94 | 23:45 | 39,1 | 58,4 |
| 95 | 00:00 | 40,4 | 62,0 |
| 96 | 00:15 | 38,8 | 56,3 |

**2.GÜN**
**27-28.09.2022**
**43.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,3 | 58,4 |
| 2 | 00:45 | 42,1 | 56,9 |
| 3 | 01:00 | 43,2 | 60,7 |
| 4 | 01:15 | 45,0 | 63,0 |
| 5 | 01:30 | 45,5 | 59,4 |
| 6 | 01:45 | 45,2 | 57,9 |
| 7 | 02:00 | 44,7 | 55,0 |
| 8 | 02:15 | 44,1 | 62,4 |
| 9 | 02:30 | 43,4 | 58,1 |
| 10 | 02:45 | 45,0 | 60,6 |
| 11 | 03:00 | 45,1 | 55,0 |
| 12 | 03:15 | 45,2 | 58,2 |
| 13 | 03:30 | 45,6 | 61,5 |
| 14 | 03:45 | 45,2 | 63,6 |
| 15 | 04:00 | 45,4 | 59,4 |
| 16 | 04:15 | 45,6 | 61,4 |
| 17 | 04:30 | 45,1 | 63,2 |
| 18 | 04:45 | 43,8 | 60,7 |
| 19 | 05:00 | 42,9 | 55,2 |
| 20 | 05:15 | 42,5 | 55,0 |
| 21 | 05:30 | 42,2 | 53,0 |
| 22 | 05:45 | 40,2 | 52,6 |
| 23 | 06:00 | 39,7 | 55,0 |
| 24 | 06:15 | 39,2 | 51,4 |
| 25 | 06:30 | 41,0 | 52,6 |
| 26 | 06:45 | 40,7 | 49,5 |
| 27 | 07:00 | 40,9 | 57,5 |
| 28 | 07:15 | 40,4 | 53,7 |
| 29 | 07:30 | 43,7 | 55,7 |
| 30 | 07:45 | 47,2 | 56,2 |
| 31 | 08:00 | 47,8 | 53,3 |
| 32 | 08:15 | 49,4 | 55,7 |
| 33 | 08:30 | 49,7 | 53,2 |
| 34 | 08:45 | 48,5 | 55,2 |
| 35 | 09:00 | 51,7 | 56,5 |
| 36 | 09:15 | 50,6 | 58,4 |
| 37 | 09:30 | 51,0 | 60,1 |
| 38 | 09:45 | 51,5 | 61,2 |
| 39 | 10:00 | 52,9 | 63,4 |
| 40 | 10:15 | 52,7 | 60,2 |
| 41 | 10:30 | 53,2 | 61,5 |
| 42 | 10:45 | 53,8 | 60,2 |
| 43 | 11:00 | 53,6 | 60,5 |
| 44 | 11:15 | 53,1 | 61,0 |
| 45 | 11:30 | 52,7 | 61,1 |
| 46 | 11:45 | 53,8 | 60,4 |
| 47 | 12:00 | 53,6 | 61,7 |
| 48 | 12:15 | 54,2 | 60,3 |
| 49 | 12:30 | 54,3 | 59,4 |
| 50 | 12:45 | 54,6 | 60,1 |
| 51 | 13:00 | 54,0 | 61,7 |
| 52 | 13:15 | 53,4 | 58,6 |
| 53 | 13:30 | 53,2 | 60,3 |
| 54 | 13:45 | 52,8 | 61,2 |
| 55 | 14:00 | 54,1 | 59,4 |
| 56 | 14:15 | 52,2 | 58,8 |
| 57 | 14:30 | 50,7 | 55,6 |
| 58 | 14:45 | 51,0 | 57,2 |
| 59 | 15:00 | 51,5 | 59,3 |
| 60 | 15:15 | 53,1 | 63,2 |
| 61 | 15:30 | 51,6 | 63,3 |
| 62 | 15:45 | 51,3 | 57,1 |
| 63 | 16:00 | 51,8 | 61,5 |
| 64 | 16:15 | 50,9 | 59,1 |
| 65 | 16:30 | 51,4 | 60,6 |
| 66 | 16:45 | 52,0 | 59,8 |
| 67 | 17:00 | 52,8 | 60,5 |
| 68 | 17:15 | 52,4 | 57,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 69 | 17:30 | 51,0 | 60,7 |
| 70 | 17:45 | 53,1 | 62,1 |
| 71 | 18:00 | 51,6 | 60,2 |
| 72 | 18:15 | 51,4 | 59,8 |
| 73 | 18:30 | 51,7 | 64,6 |
| 74 | 18:45 | 52,9 | 64,0 |
| 75 | 19:00 | 52,4 | 61,8 |
| 76 | 19:15 | 52,0 | 57,0 |
| 77 | 19:30 | 52,6 | 63,0 |
| 78 | 19:45 | 50,4 | 64,6 |
| 79 | 20:00 | 47,6 | 59,2 |
| 80 | 20:15 | 46,4 | 60,6 |
| 81 | 20:30 | 43,5 | 62,4 |
| 82 | 20:45 | 41,1 | 58,6 |
| 83 | 21:00 | 40,5 | 52,9 |
| 84 | 21:15 | 41,2 | 54,9 |
| 85 | 21:30 | 41,7 | 56,9 |
| 86 | 21:45 | 41,0 | 56,3 |
| 87 | 22:00 | 41,0 | 54,8 |
| 88 | 22:15 | 41,1 | 55,3 |
| 89 | 22:30 | 41,2 | 57,2 |
| 90 | 22:45 | 41,4 | 60,3 |
| 91 | 23:00 | 42,3 | 58,1 |
| 92 | 23:15 | 42,0 | 56,2 |
| 93 | 23:30 | 39,6 | 59,0 |
| 94 | 23:45 | 38,7 | 56,1 |
| 95 | 00:00 | 40,0 | 59,6 |
| 96 | 00:15 | 38,4 | 56,7 |

**2.GÜN**
**27-28.09.2022**
**44.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 45,3 | 59,1 |
| 2 | 00:45 | 45,0 | 57,7 |
| 3 | 01:00 | 44,4 | 54,9 |
| 4 | 01:15 | 44,6 | 56,6 |
| 5 | 01:30 | 42,7 | 54,9 |
| 6 | 01:45 | 43,5 | 57,7 |
| 7 | 02:00 | 44,9 | 56,4 |
| 8 | 02:15 | 43,8 | 58,5 |
| 9 | 02:30 | 41,1 | 55,0 |
| 10 | 02:45 | 42,6 | 57,6 |
| 11 | 03:00 | 42,7 | 52,2 |
| 12 | 03:15 | 42,4 | 54,6 |
| 13 | 03:30 | 42,8 | 57,7 |
| 14 | 03:45 | 42,4 | 59,8 |
| 15 | 04:00 | 42,6 | 55,8 |
| 16 | 04:15 | 42,8 | 57,6 |
| 17 | 04:30 | 42,3 | 59,2 |
| 18 | 04:45 | 41,2 | 60,1 |
| 19 | 05:00 | 43,6 | 55,1 |
| 20 | 05:15 | 41,8 | 54,8 |
| 21 | 05:30 | 44,2 | 52,8 |
| 22 | 05:45 | 42,4 | 52,3 |
| 23 | 06:00 | 38,8 | 53,9 |
| 24 | 06:15 | 38,3 | 50,3 |
| 25 | 06:30 | 41,1 | 51,5 |
| 26 | 06:45 | 42,8 | 48,4 |
| 27 | 07:00 | 40,0 | 56,3 |
| 28 | 07:15 | 42,5 | 52,6 |
| 29 | 07:30 | 42,7 | 54,5 |
| 30 | 07:45 | 46,1 | 55,0 |
| 31 | 08:00 | 46,7 | 52,2 |
| 32 | 08:15 | 48,3 | 54,5 |
| 33 | 08:30 | 48,6 | 52,1 |
| 34 | 08:45 | 47,4 | 54,1 |
| 35 | 09:00 | 50,6 | 55,3 |
| 36 | 09:15 | 49,5 | 57,2 |
| 37 | 09:30 | 49,9 | 58,8 |
| 38 | 09:45 | 50,4 | 59,9 |
| 39 | 10:00 | 51,8 | 62,1 |
| 40 | 10:15 | 51,6 | 58,9 |
| 41 | 10:30 | 52,1 | 60,2 |
| 42 | 10:45 | 52,7 | 58,9 |
| 43 | 11:00 | 52,5 | 59,2 |
| 44 | 11:15 | 52,0 | 59,7 |
| 45 | 11:30 | 51,6 | 59,8 |
| 46 | 11:45 | 52,7 | 59,1 |
| 47 | 12:00 | 52,5 | 60,4 |
| 48 | 12:15 | 53,1 | 59,0 |
| 49 | 12:30 | 53,2 | 58,2 |
| 50 | 12:45 | 53,5 | 58,8 |
| 51 | 13:00 | 52,9 | 60,4 |
| 52 | 13:15 | 52,3 | 57,4 |
| 53 | 13:30 | 53,3 | 60,4 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 54 | 13:45 | 53,1 | 59,7 |
| 55 | 14:00 | 53,5 | 60,5 |
| 56 | 14:15 | 51,8 | 61,4 |
| 57 | 14:30 | 51,7 | 59,8 |
| 58 | 14:45 | 50,4 | 60,9 |
| 59 | 15:00 | 50,3 | 63,4 |
| 60 | 15:15 | 53,8 | 57,9 |
| 61 | 15:30 | 52,2 | 62,5 |
| 62 | 15:45 | 51,4 | 57,8 |
| 63 | 16:00 | 52,2 | 58,5 |
| 64 | 16:15 | 52,5 | 59,7 |
| 65 | 16:30 | 51,9 | 58,5 |
| 66 | 16:45 | 52,5 | 55,5 |
| 67 | 17:00 | 52,9 | 59,9 |
| 68 | 17:15 | 53,5 | 58,2 |
| 69 | 17:30 | 50,3 | 59,6 |
| 70 | 17:45 | 49,2 | 56,9 |
| 71 | 18:00 | 48,5 | 59,6 |
| 72 | 18:15 | 46,2 | 64,1 |
| 73 | 18:30 | 47,8 | 57,8 |
| 74 | 18:45 | 48,2 | 62,9 |
| 75 | 19:00 | 45,7 | 64,1 |
| 76 | 19:15 | 47,5 | 59,8 |
| 77 | 19:30 | 42,3 | 58,3 |
| 78 | 19:45 | 41,9 | 61,7 |
| 79 | 20:00 | 40,9 | 62,1 |
| 80 | 20:15 | 39,5 | 62,9 |
| 81 | 20:30 | 40,4 | 62,0 |
| 82 | 20:45 | 41,7 | 60,8 |
| 83 | 21:00 | 40,2 | 60,3 |
| 84 | 21:15 | 41,2 | 57,5 |
| 85 | 21:30 | 40,3 | 56,2 |
| 86 | 21:45 | 42,4 | 57,8 |
| 87 | 22:00 | 39,9 | 58,5 |
| 88 | 22:15 | 40,9 | 60,4 |
| 89 | 22:30 | 41,6 | 60,1 |
| 90 | 22:45 | 39,8 | 56,2 |
| 91 | 23:00 | 42,9 | 60,3 |
| 92 | 23:15 | 43,3 | 60,2 |
| 93 | 23:30 | 42,9 | 62,1 |
| 94 | 23:45 | 42,6 | 63,5 |
| 95 | 00:00 | 44,0 | 62,6 |
| 96 | 00:15 | 42,4 | 62,0 |

**2.GÜN**
**27-28.09.2022**
**45.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,8 | 54,6 |
| 2 | 00:45 | 44,2 | 52,8 |
| 3 | 01:00 | 41,8 | 51,1 |
| 4 | 01:15 | 43,7 | 52,1 |
| 5 | 01:30 | 42,2 | 50,9 |
| 6 | 01:45 | 43,8 | 51,9 |
| 7 | 02:00 | 41,1 | 50,6 |
| 8 | 02:15 | 44,2 | 52,0 |
| 9 | 02:30 | 42,2 | 48,9 |
| 10 | 02:45 | 40,6 | 50,1 |
| 11 | 03:00 | 40,1 | 49,4 |
| 12 | 03:15 | 41,8 | 48,1 |
| 13 | 03:30 | 41,9 | 52,5 |
| 14 | 03:45 | 40,8 | 48,9 |
| 15 | 04:00 | 42,0 | 51,9 |
| 16 | 04:15 | 40,9 | 51,2 |
| 17 | 04:30 | 43,6 | 54,6 |
| 18 | 04:45 | 41,8 | 50,1 |
| 19 | 05:00 | 43,1 | 52,5 |
| 20 | 05:15 | 41,0 | 50,5 |
| 21 | 05:30 | 40,6 | 50,4 |
| 22 | 05:45 | 40,5 | 50,7 |
| 23 | 06:00 | 39,1 | 47,0 |
| 24 | 06:15 | 39,5 | 47,4 |
| 25 | 06:30 | 42,4 | 51,2 |
| 26 | 06:45 | 41,6 | 48,5 |
| 27 | 07:00 | 42,4 | 49,4 |
| 28 | 07:15 | 43,9 | 51,6 |
| 29 | 07:30 | 44,4 | 50,2 |
| 30 | 07:45 | 42,0 | 51,0 |
| 31 | 08:00 | 42,4 | 51,8 |
| 32 | 08:15 | 42,0 | 50,1 |
| 33 | 08:30 | 43,0 | 50,0 |
| 34 | 08:45 | 44,7 | 53,4 |
| 35 | 09:00 | 46,6 | 56,5 |
| 36 | 09:15 | 50,7 | 58,2 |
| 37 | 09:30 | 47,5 | 55,9 |
| 38 | 09:45 | 49,3 | 57,1 |


rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 39 | 10:00 | 50,2 | 56,3 |
| 40 | 10:15 | 48,3 | 56,0 |
| 41 | 10:30 | 49,0 | 58,0 |
| 42 | 10:45 | 47,1 | 58,1 |
| 43 | 11:00 | 46,7 | 56,4 |
| 44 | 11:15 | 51,3 | 60,1 |
| 45 | 11:30 | 47,8 | 57,0 |
| 46 | 11:45 | 52,6 | 62,9 |
| 47 | 12:00 | 47,9 | 57,2 |
| 48 | 12:15 | 53,9 | 62,1 |
| 49 | 12:30 | 50,5 | 58,1 |
| 50 | 12:45 | 52,0 | 57,2 |
| 51 | 13:00 | 47,6 | 57,2 |
| 52 | 13:15 | 52,7 | 61,5 |
| 53 | 13:30 | 50,2 | 61,2 |
| 54 | 13:45 | 51,9 | 61,5 |
| 55 | 14:00 | 49,0 | 57,9 |
| 56 | 14:15 | 51,4 | 58,5 |
| 57 | 14:30 | 50,1 | 59,5 |
| 58 | 14:45 | 46,9 | 60,1 |
| 59 | 15:00 | 50,8 | 60,2 |
| 60 | 15:15 | 52,5 | 61,7 |
| 61 | 15:30 | 52,8 | 60,7 |
| 62 | 15:45 | 51,5 | 61,5 |
| 63 | 16:00 | 50,8 | 60,5 |
| 64 | 16:15 | 49,7 | 59,8 |
| 65 | 16:30 | 48,9 | 60,4 |
| 66 | 16:45 | 48,6 | 58,6 |
| 67 | 17:00 | 51,3 | 60,5 |
| 68 | 17:15 | 49,5 | 59,5 |
| 69 | 17:30 | 51,3 | 63,6 |
| 70 | 17:45 | 50,9 | 62,1 |
| 71 | 18:00 | 46,0 | 62,9 |
| 72 | 18:15 | 47,5 | 59,1 |
| 73 | 18:30 | 43,5 | 55,4 |
| 74 | 18:45 | 46,6 | 57,4 |
| 75 | 19:00 | 43,6 | 57,6 |
| 76 | 19:15 | 42,5 | 56,4 |
| 77 | 19:30 | 46,5 | 58,0 |
| 78 | 19:45 | 46,4 | 59,2 |
| 79 | 20:00 | 42,4 | 56,0 |
| 80 | 20:15 | 42,5 | 54,7 |
| 81 | 20:30 | 42,9 | 58,4 |
| 82 | 20:45 | 42,3 | 53,2 |
| 83 | 21:00 | 44,2 | 53,3 |
| 84 | 21:15 | 42,5 | 54,4 |
| 85 | 21:30 | 43,2 | 54,3 |
| 86 | 21:45 | 43,8 | 53,0 |
| 87 | 22:00 | 43,3 | 53,5 |
| 88 | 22:15 | 43,5 | 53,0 |
| 89 | 22:30 | 43,9 | 52,0 |
| 90 | 22:45 | 47,1 | 52,4 |
| 91 | 23:00 | 46,7 | 56,5 |
| 92 | 23:15 | 45,7 | 55,5 |
| 93 | 23:30 | 40,4 | 57,1 |
| 94 | 23:45 | 39,8 | 52,0 |
| 95 | 00:00 | 41,2 | 53,2 |
| 96 | 00:15 | 39,8 | 51,6 |

**2.GÜN**
**27-28.09.2022**
**46.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 35,8 | 58,1 |
| 2 | 00:45 | 34,4 | 51,7 |
| 3 | 01:00 | 36,4 | 53,4 |
| 4 | 01:15 | 37,6 | 53,8 |
| 5 | 01:30 | 38,3 | 55,3 |
| 6 | 01:45 | 38,3 | 55,1 |
| 7 | 02:00 | 38,6 | 55,8 |
| 8 | 02:15 | 38,5 | 54,0 |
| 9 | 02:30 | 35,8 | 51,7 |
| 10 | 02:45 | 36,1 | 52,7 |
| 11 | 03:00 | 36,7 | 53,4 |
| 12 | 03:15 | 35,7 | 53,0 |
| 13 | 03:30 | 35,2 | 52,1 |
| 14 | 03:45 | 33,9 | 50,5 |
| 15 | 04:00 | 33,9 | 52,4 |
| 16 | 04:15 | 34,6 | 50,6 |
| 17 | 04:30 | 33,7 | 49,8 |
| 18 | 04:45 | 35,4 | 51,1 |
| 19 | 05:00 | 36,3 | 50,0 |
| 20 | 05:15 | 34,8 | 52,5 |
| 21 | 05:30 | 35,0 | 52,1 |
| 22 | 05:45 | 35,5 | 51,5 |
| 23 | 06:00 | 33,1 | 48,2 |
| 24 | 06:15 | 33,3 | 50,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 25 | 06:30 | 33,7 | 48,6 |
| 26 | 06:45 | 33,3 | 50,0 |
| 27 | 07:00 | 37,0 | 52,1 |
| 28 | 07:15 | 37,9 | 53,5 |
| 29 | 07:30 | 37,0 | 52,2 |
| 30 | 07:45 | 39,6 | 53,0 |
| 31 | 08:00 | 39,6 | 53,1 |
| 32 | 08:15 | 43,5 | 56,7 |
| 33 | 08:30 | 44,4 | 59,2 |
| 34 | 08:45 | 50,1 | 63,5 |
| 35 | 09:00 | 51,8 | 65,7 |
| 36 | 09:15 | 51,2 | 65,9 |
| 37 | 09:30 | 51,1 | 65,7 |
| 38 | 09:45 | 51,2 | 66,0 |
| 39 | 10:00 | 50,7 | 60,9 |
| 40 | 10:15 | 50,5 | 63,7 |
| 41 | 10:30 | 50,9 | 61,8 |
| 42 | 10:45 | 51,1 | 64,3 |
| 43 | 11:00 | 51,2 | 64,3 |
| 44 | 11:15 | 52,5 | 64,8 |
| 45 | 11:30 | 53,4 | 65,9 |
| 46 | 11:45 | 54,2 | 67,5 |
| 47 | 12:00 | 51,2 | 63,1 |
| 48 | 12:15 | 51,0 | 64,5 |
| 49 | 12:30 | 52,5 | 65,3 |
| 50 | 12:45 | 56,0 | 66,7 |
| 51 | 13:00 | 54,9 | 67,4 |
| 52 | 13:15 | 55,6 | 69,2 |
| 53 | 13:30 | 51,4 | 62,2 |
| 54 | 13:45 | 52,2 | 63,7 |
| 55 | 14:00 | 51,4 | 63,9 |
| 56 | 14:15 | 49,8 | 63,2 |
| 57 | 14:30 | 49,6 | 64,4 |
| 58 | 14:45 | 52,4 | 64,0 |
| 59 | 15:00 | 52,2 | 65,6 |
| 60 | 15:15 | 51,8 | 63,0 |
| 61 | 15:30 | 54,2 | 64,0 |
| 62 | 15:45 | 53,2 | 64,8 |
| 63 | 16:00 | 54,2 | 66,4 |
| 64 | 16:15 | 54,4 | 64,8 |
| 65 | 16:30 | 53,7 | 62,7 |
| 66 | 16:45 | 50,6 | 64,3 |
| 67 | 17:00 | 50,9 | 65,0 |
| 68 | 17:15 | 51,4 | 62,5 |
| 69 | 17:30 | 52,2 | 64,7 |
| 70 | 17:45 | 52,7 | 65,9 |
| 71 | 18:00 | 49,2 | 64,7 |
| 72 | 18:15 | 44,0 | 58,8 |
| 73 | 18:30 | 43,5 | 60,3 |
| 74 | 18:45 | 39,9 | 57,6 |
| 75 | 19:00 | 39,7 | 58,8 |
| 76 | 19:15 | 35,7 | 54,8 |
| 77 | 19:30 | 34,8 | 53,4 |
| 78 | 19:45 | 36,9 | 56,5 |
| 79 | 20:00 | 37,0 | 56,9 |
| 80 | 20:15 | 36,6 | 57,6 |
| 81 | 20:30 | 36,6 | 56,7 |
| 82 | 20:45 | 36,9 | 55,6 |
| 83 | 21:00 | 36,7 | 55,1 |
| 84 | 21:15 | 37,7 | 52,7 |
| 85 | 21:30 | 36,9 | 51,4 |
| 86 | 21:45 | 37,3 | 52,8 |
| 87 | 22:00 | 36,6 | 53,5 |
| 88 | 22:15 | 37,4 | 55,3 |
| 89 | 22:30 | 38,1 | 55,0 |
| 90 | 22:45 | 36,4 | 51,4 |
| 91 | 23:00 | 39,3 | 55,1 |
| 92 | 23:15 | 39,6 | 59,8 |
| 93 | 23:30 | 39,3 | 56,9 |
| 94 | 23:45 | 38,9 | 54,5 |
| 95 | 00:00 | 40,2 | 57,6 |
| 96 | 00:15 | 38,8 | 53,4 |

**2.GÜN**
**27-28.09.2022**
**47.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,0 | 56,7 |
| 2 | 00:45 | 43,3 | 56,5 |
| 3 | 01:00 | 44,8 | 56,1 |
| 4 | 01:15 | 46,7 | 61,7 |
| 5 | 01:30 | 46,4 | 60,4 |
| 6 | 01:45 | 46,4 | 61,2 |
| 7 | 02:00 | 46,8 | 62,9 |
| 8 | 02:15 | 46,8 | 60,7 |
| 9 | 02:30 | 43,2 | 59,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10 | 02:45 | 43,6 | 58,6 | 54 | 13:45 | 54,7 | 65,0 |
| 11 | 03:00 | 44,1 | 58,3 | 55 | 14:00 | 54,0 | 67,9 |
| 12 | 03:15 | 43,1 | 60,0 | 56 | 14:15 | 54,4 | 65,7 |
| 13 | 03:30 | 42,5 | 58,8 | 57 | 14:30 | 54,5 | 67,3 |
| 14 | 03:45 | 40,9 | 58,3 | 58 | 14:45 | 54,0 | 67,5 |
| 15 | 04:00 | 40,9 | 59,6 | 59 | 15:00 | 56,2 | 65,7 |
| 16 | 04:15 | 41,6 | 58,7 | 60 | 15:15 | 55,3 | 67,4 |
| 17 | 04:30 | 40,8 | 55,8 | 61 | 15:30 | 56,2 | 67,0 |
| 18 | 04:45 | 42,8 | 60,7 | 62 | 15:45 | 54,5 | 66,8 |
| 19 | 05:00 | 43,6 | 59,8 | 63 | 16:00 | 56,1 | 66,5 |
| 20 | 05:15 | 43,1 | 59,0 | 64 | 16:15 | 54,3 | 67,3 |
| 21 | 05:30 | 43,3 | 61,7 | 65 | 16:30 | 52,9 | 65,7 |
| 22 | 05:45 | 44,0 | 58,3 | 66 | 16:45 | 53,6 | 65,4 |
| 23 | 06:00 | 40,9 | 57,6 | 67 | 17:00 | 53,8 | 67,3 |
| 24 | 06:15 | 41,1 | 55,3 | 68 | 17:15 | 54,4 | 66,4 |
| 25 | 06:30 | 41,6 | 56,1 | 69 | 17:30 | 54,3 | 67,7 |
| 26 | 06:45 | 41,1 | 55,5 | 70 | 17:45 | 53,2 | 66,0 |
| 27 | 07:00 | 46,1 | 59,5 | 71 | 18:00 | 49,7 | 67,5 |
| 28 | 07:15 | 47,7 | 61,4 | 72 | 18:15 | 45,1 | 68,0 |
| 29 | 07:30 | 47,2 | 59,8 | 73 | 18:30 | 43,8 | 68,5 |
| 30 | 07:45 | 51,4 | 60,8 | 74 | 18:45 | 40,9 | 64,3 |
| 31 | 08:00 | 50,5 | 62,4 | 75 | 19:00 | 42,1 | 65,3 |
| 32 | 08:15 | 56,1 | 66,6 | 76 | 19:15 | 38,2 | 61,6 |
| 33 | 08:30 | 50,3 | 68,9 | 77 | 19:30 | 38,4 | 61,6 |
| 34 | 08:45 | 55,3 | 67,5 | 78 | 19:45 | 40,6 | 65,3 |
| 35 | 09:00 | 56,0 | 68,5 | 79 | 20:00 | 40,0 | 65,9 |
| 36 | 09:15 | 56,2 | 66,7 | 80 | 20:15 | 39,6 | 64,0 |
| 37 | 09:30 | 56,2 | 68,8 | 81 | 20:30 | 39,3 | 64,8 |
| 38 | 09:45 | 56,5 | 68,0 | 82 | 20:45 | 39,8 | 65,9 |
| 39 | 10:00 | 53,9 | 67,3 | 83 | 21:00 | 39,7 | 64,2 |
| 40 | 10:15 | 54,7 | 69,4 | 84 | 21:15 | 39,0 | 61,0 |
| 41 | 10:30 | 53,9 | 68,6 | 85 | 21:30 | 38,1 | 61,7 |
| 42 | 10:45 | 54,7 | 70,5 | 86 | 21:45 | 40,1 | 61,5 |
| 43 | 11:00 | 54,5 | 68,8 | 87 | 22:00 | 39,3 | 60,3 |
| 44 | 11:15 | 53,9 | 66,6 | 88 | 22:15 | 40,4 | 64,2 |
| 45 | 11:30 | 55,0 | 68,0 | 89 | 22:30 | 41,1 | 64,8 |
| 46 | 11:45 | 56,1 | 69,4 | 90 | 22:45 | 39,7 | 60,3 |
| 47 | 12:00 | 53,3 | 65,9 | 91 | 23:00 | 42,5 | 58,3 |
| 48 | 12:15 | 52,1 | 69,6 | 92 | 23:15 | 45,5 | 64,2 |
| 49 | 12:30 | 53,4 | 67,1 | 93 | 23:30 | 43,3 | 63,0 |
| 50 | 12:45 | 56,2 | 68,6 | 94 | 23:45 | 42,3 | 62,2 |
| 51 | 13:00 | 57,6 | 67,5 | 95 | 00:00 | 41,8 | 64,6 |
| 52 | 13:15 | 59,4 | 68,6 | 96 | 00:15 | 40,6 | 62,5 |
| 53 | 13:30 | 55,0 | 67,3 | | | | |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**2.GÜN**
**27-28.09.2022**
**48.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,4 | 54,1 |
| 2 | 00:45 | 39,0 | 50,7 |
| 3 | 01:00 | 39,6 | 50,4 |
| 4 | 01:15 | 41,2 | 55,4 |
| 5 | 01:30 | 43,4 | 57,4 |
| 6 | 01:45 | 43,5 | 58,4 |
| 7 | 02:00 | 41,8 | 57,0 |
| 8 | 02:15 | 43,8 | 57,6 |
| 9 | 02:30 | 39,0 | 54,6 |
| 10 | 02:45 | 39,4 | 53,6 |
| 11 | 03:00 | 39,8 | 53,3 |
| 12 | 03:15 | 38,9 | 55,0 |
| 13 | 03:30 | 41,5 | 56,8 |
| 14 | 03:45 | 40,9 | 57,5 |
| 15 | 04:00 | 41,0 | 59,0 |
| 16 | 04:15 | 41,5 | 58,1 |
| 17 | 04:30 | 40,5 | 55,0 |
| 18 | 04:45 | 39,8 | 56,1 |
| 19 | 05:00 | 42,5 | 58,2 |
| 20 | 05:15 | 40,4 | 55,3 |
| 21 | 05:30 | 42,3 | 60,1 |
| 22 | 05:45 | 42,9 | 56,7 |
| 23 | 06:00 | 38,6 | 53,8 |
| 24 | 06:15 | 38,3 | 51,3 |
| 25 | 06:30 | 40,7 | 54,9 |
| 26 | 06:45 | 39,2 | 52,5 |
| 27 | 07:00 | 45,2 | 58,0 |
| 28 | 07:15 | 45,1 | 58,0 |
| 29 | 07:30 | 44,4 | 56,0 |
| 30 | 07:45 | 44,4 | 55,6 |
| 31 | 08:00 | 43,7 | 57,1 |
| 32 | 08:15 | 44,8 | 56,3 |
| 33 | 08:30 | 44,3 | 57,0 |
| 34 | 08:45 | 48,6 | 56,0 |
| 35 | 09:00 | 49,7 | 57,1 |
| 36 | 09:15 | 52,2 | 58,0 |
| 37 | 09:30 | 50,1 | 57,6 |
| 38 | 09:45 | 51,3 | 58,0 |
| 39 | 10:00 | 48,8 | 57,3 |
| 40 | 10:15 | 49,6 | 59,1 |
| 41 | 10:30 | 48,8 | 58,4 |
| 42 | 10:45 | 48,6 | 58,9 |
| 43 | 11:00 | 48,0 | 57,0 |
| 44 | 11:15 | 49,8 | 57,9 |
| 45 | 11:30 | 47,9 | 56,0 |
| 46 | 11:45 | 52,0 | 60,5 |
| 47 | 12:00 | 47,0 | 60,2 |
| 48 | 12:15 | 49,0 | 61,6 |
| 49 | 12:30 | 50,1 | 62,7 |
| 50 | 12:45 | 52,9 | 63,9 |
| 51 | 13:00 | 50,8 | 60,9 |
| 52 | 13:15 | 54,7 | 62,5 |
| 53 | 13:30 | 55,9 | 64,7 |
| 54 | 13:45 | 54,4 | 61,2 |
| 55 | 14:00 | 51,6 | 61,7 |
| 56 | 14:15 | 54,1 | 62,1 |
| 57 | 14:30 | 51,8 | 60,5 |
| 58 | 14:45 | 51,2 | 60,9 |
| 59 | 15:00 | 53,4 | 58,9 |
| 60 | 15:15 | 55,0 | 63,7 |
| 61 | 15:30 | 56,9 | 64,5 |
| 62 | 15:45 | 54,3 | 63,0 |
| 63 | 16:00 | 55,8 | 62,7 |
| 64 | 16:15 | 54,4 | 64,1 |
| 65 | 16:30 | 52,5 | 62,0 |
| 66 | 16:45 | 50,7 | 58,5 |
| 67 | 17:00 | 50,8 | 60,3 |
| 68 | 17:15 | 52,0 | 60,1 |
| 69 | 17:30 | 54,5 | 64,6 |
| 70 | 17:45 | 53,6 | 63,1 |
| 71 | 18:00 | 53,2 | 64,5 |
| 72 | 18:15 | 49,1 | 66,3 |
| 73 | 18:30 | 45,5 | 63,3 |
| 74 | 18:45 | 44,0 | 62,1 |
| 75 | 19:00 | 43,5 | 60,4 |
| 76 | 19:15 | 39,5 | 57,0 |
| 77 | 19:30 | 41,5 | 59,2 |
| 78 | 19:45 | 44,5 | 64,1 |
| 79 | 20:00 | 41,8 | 61,3 |
| 80 | 20:15 | 41,2 | 59,4 |
| 81 | 20:30 | 41,1 | 60,3 |
| 82 | 20:45 | 42,9 | 63,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 83 | 21:00 | 42,5 | 62,0 |
| 84 | 21:15 | 41,8 | 58,7 |
| 85 | 21:30 | 40,8 | 59,5 |
| 86 | 21:45 | 43,0 | 59,5 |
| 87 | 22:00 | 42,2 | 58,2 |
| 88 | 22:15 | 43,3 | 62,1 |
| 89 | 22:30 | 44,0 | 62,7 |
| 90 | 22:45 | 42,5 | 58,2 |
| 91 | 23:00 | 45,5 | 56,6 |
| 92 | 23:15 | 48,8 | 62,2 |
| 93 | 23:30 | 43,2 | 57,1 |
| 94 | 23:45 | 42,5 | 56,3 |
| 95 | 00:00 | 42,1 | 58,5 |
| 96 | 00:15 | 43,5 | 61,8 |

**2.GÜN**
**27-28.09.2022**
**49.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 41,5 | 59,1 |
| 2 | 00:45 | 40,9 | 58,2 |
| 3 | 01:00 | 42,2 | 61,9 |
| 4 | 01:15 | 43,7 | 62,3 |
| 5 | 01:30 | 44,6 | 64,1 |
| 6 | 01:45 | 44,6 | 63,9 |
| 7 | 02:00 | 44,9 | 64,8 |
| 8 | 02:15 | 44,8 | 62,5 |
| 9 | 02:30 | 41,5 | 59,9 |
| 10 | 02:45 | 41,8 | 61,2 |
| 11 | 03:00 | 42,4 | 61,9 |
| 12 | 03:15 | 41,3 | 61,4 |
| 13 | 03:30 | 41,7 | 60,3 |
| 14 | 03:45 | 41,1 | 59,7 |
| 15 | 04:00 | 41,1 | 61,9 |
| 16 | 04:15 | 41,8 | 59,9 |
| 17 | 04:30 | 40,9 | 59,0 |
| 18 | 04:45 | 42,8 | 60,5 |
| 19 | 05:00 | 43,8 | 59,3 |
| 20 | 05:15 | 42,2 | 62,1 |
| 21 | 05:30 | 42,3 | 61,5 |
| 22 | 05:45 | 43,1 | 60,9 |
| 23 | 06:00 | 40,0 | 56,9 |
| 24 | 06:15 | 40,3 | 59,3 |
| 25 | 06:30 | 40,7 | 57,5 |
| 26 | 06:45 | 40,3 | 59,3 |
| 27 | 07:00 | 44,8 | 61,5 |
| 28 | 07:15 | 45,9 | 63,3 |
| 29 | 07:30 | 44,8 | 61,8 |
| 30 | 07:45 | 45,2 | 62,6 |
| 31 | 08:00 | 45,2 | 62,7 |
| 32 | 08:15 | 44,7 | 60,7 |
| 33 | 08:30 | 45,8 | 63,2 |
| 34 | 08:45 | 51,5 | 67,8 |
| 35 | 09:00 | 53,2 | 70,3 |
| 36 | 09:15 | 52,7 | 70,5 |
| 37 | 09:30 | 52,6 | 70,3 |
| 38 | 09:45 | 52,7 | 70,7 |
| 39 | 10:00 | 52,1 | 65,2 |
| 40 | 10:15 | 51,9 | 68,0 |
| 41 | 10:30 | 52,3 | 66,0 |
| 42 | 10:45 | 52,6 | 68,6 |
| 43 | 11:00 | 52,7 | 68,6 |
| 44 | 11:15 | 54,0 | 69,2 |
| 45 | 11:30 | 54,8 | 70,4 |
| 46 | 11:45 | 55,6 | 72,2 |
| 47 | 12:00 | 52,7 | 67,3 |
| 48 | 12:15 | 52,5 | 68,8 |
| 49 | 12:30 | 54,0 | 69,8 |
| 50 | 12:45 | 57,5 | 71,3 |
| 51 | 13:00 | 56,4 | 71,9 |
| 52 | 13:15 | 56,5 | 73,7 |
| 53 | 13:30 | 56,8 | 72,1 |
| 54 | 13:45 | 57,6 | 73,7 |
| 55 | 14:00 | 56,8 | 74,0 |
| 56 | 14:15 | 54,8 | 73,0 |
| 57 | 14:30 | 54,7 | 74,5 |
| 58 | 14:45 | 57,7 | 74,1 |
| 59 | 15:00 | 57,6 | 75,9 |
| 60 | 15:15 | 57,1 | 72,8 |
| 61 | 15:30 | 59,6 | 74,1 |
| 62 | 15:45 | 58,7 | 75,2 |
| 63 | 16:00 | 59,6 | 77,0 |
| 64 | 16:15 | 59,9 | 75,2 |
| 65 | 16:30 | 59,3 | 72,5 |
| 66 | 16:45 | 55,7 | 74,3 |
| 67 | 17:00 | 56,0 | 75,3 |
| 68 | 17:15 | 56,8 | 72,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 69 | 17:30 | 58,7 | 76,5 |
| 70 | 17:45 | 59,5 | 77,9 |
| 71 | 18:00 | 58,7 | 76,5 |
| 72 | 18:15 | 52,6 | 69,4 |
| 73 | 18:30 | 51,9 | 71,2 |
| 74 | 18:45 | 47,7 | 68,1 |
| 75 | 19:00 | 47,4 | 69,4 |
| 76 | 19:15 | 42,7 | 64,8 |
| 77 | 19:30 | 41,7 | 63,0 |
| 78 | 19:45 | 44,2 | 66,8 |
| 79 | 20:00 | 44,3 | 67,3 |
| 80 | 20:15 | 43,8 | 68,1 |
| 81 | 20:30 | 43,8 | 67,0 |
| 82 | 20:45 | 44,2 | 65,8 |
| 83 | 21:00 | 43,6 | 65,4 |
| 84 | 21:15 | 44,7 | 62,3 |
| 85 | 21:30 | 43,7 | 60,8 |
| 86 | 21:45 | 44,1 | 62,5 |
| 87 | 22:00 | 43,4 | 63,3 |
| 88 | 22:15 | 44,3 | 65,5 |
| 89 | 22:30 | 45,2 | 65,0 |
| 90 | 22:45 | 43,2 | 60,8 |
| 91 | 23:00 | 46,6 | 65,4 |
| 92 | 23:15 | 47,0 | 70,6 |
| 93 | 23:30 | 46,6 | 67,3 |
| 94 | 23:45 | 46,2 | 68,7 |
| 95 | 00:00 | 47,7 | 67,8 |
| 96 | 00:15 | 46,0 | 67,0 |

**2.GÜN**
**27-28.09.2022**
**50.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,8 | 53,9 |
| 2 | 00:45 | 37,4 | 54,1 |
| 3 | 01:00 | 37,4 | 54,7 |
| 4 | 01:15 | 38,6 | 54,9 |
| 5 | 01:30 | 40,1 | 57,8 |
| 6 | 01:45 | 39,3 | 56,5 |
| 7 | 02:00 | 40,1 | 57,8 |
| 8 | 02:15 | 40,4 | 56,4 |
| 9 | 02:30 | 38,8 | 56,3 |
| 10 | 02:45 | 38,5 | 56,4 |
| 11 | 03:00 | 40,2 | 58,6 |
| 12 | 03:15 | 40,3 | 60,2 |
| 13 | 03:30 | 39,5 | 57,2 |
| 14 | 03:45 | 39,2 | 57,2 |
| 15 | 04:00 | 38,8 | 58,7 |
| 16 | 04:15 | 39,2 | 56,1 |
| 17 | 04:30 | 37,7 | 54,5 |
| 18 | 04:45 | 39,4 | 55,8 |
| 19 | 05:00 | 40,5 | 54,9 |
| 20 | 05:15 | 38,9 | 57,4 |
| 21 | 05:30 | 39,0 | 56,8 |
| 22 | 05:45 | 39,7 | 56,1 |
| 23 | 06:00 | 37,2 | 52,8 |
| 24 | 06:15 | 37,2 | 54,8 |
| 25 | 06:30 | 37,7 | 53,2 |
| 26 | 06:45 | 37,2 | 54,8 |
| 27 | 07:00 | 45,6 | 62,8 |
| 28 | 07:15 | 47,0 | 65,0 |
| 29 | 07:30 | 45,4 | 62,8 |
| 30 | 07:45 | 44,1 | 61,3 |
| 31 | 08:00 | 43,7 | 60,9 |
| 32 | 08:15 | 45,4 | 61,7 |
| 33 | 08:30 | 44,8 | 61,8 |
| 34 | 08:45 | 49,8 | 65,8 |
| 35 | 09:00 | 52,7 | 69,7 |
| 36 | 09:15 | 52,2 | 69,9 |
| 37 | 09:30 | 52,1 | 69,7 |
| 38 | 09:45 | 51,7 | 69,5 |
| 39 | 10:00 | 52,4 | 65,6 |
| 40 | 10:15 | 51,7 | 67,9 |
| 41 | 10:30 | 52,2 | 65,9 |
| 42 | 10:45 | 49,6 | 69,9 |
| 43 | 11:00 | 51,5 | 67,3 |
| 44 | 11:15 | 52,6 | 67,9 |
| 45 | 11:30 | 51,9 | 66,6 |
| 46 | 11:45 | 52,6 | 68,4 |
| 47 | 12:00 | 51,9 | 66,4 |
| 48 | 12:15 | 49,7 | 65,5 |
| 49 | 12:30 | 53,1 | 68,8 |
| 50 | 12:45 | 51,9 | 70,5 |
| 51 | 13:00 | 50,7 | 74,5 |
| 52 | 13:15 | 50,0 | 72,0 |
| 53 | 13:30 | 50,9 | 73,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 54 | 13:45 | 52,1 | 72,7 |
| 55 | 14:00 | 50,6 | 76,2 |
| 56 | 14:15 | 52,2 | 75,0 |
| 57 | 14:30 | 49,9 | 73,6 |
| 58 | 14:45 | 51,6 | 72,5 |
| 59 | 15:00 | 49,6 | 77,9 |
| 60 | 15:15 | 52,2 | 72,6 |
| 61 | 15:30 | 48,5 | 76,3 |
| 62 | 15:45 | 50,7 | 75,0 |
| 63 | 16:00 | 48,5 | 79,1 |
| 64 | 16:15 | 48,7 | 77,3 |
| 65 | 16:30 | 51,1 | 71,0 |
| 66 | 16:45 | 51,8 | 75,6 |
| 67 | 17:00 | 54,9 | 73,5 |
| 68 | 17:15 | 51,7 | 70,8 |
| 69 | 17:30 | 50,6 | 77,9 |
| 70 | 17:45 | 51,9 | 79,3 |
| 71 | 18:00 | 50,5 | 73,1 |
| 72 | 18:15 | 49,1 | 66,3 |
| 73 | 18:30 | 47,2 | 67,9 |
| 74 | 18:45 | 45,0 | 62,8 |
| 75 | 19:00 | 43,2 | 63,3 |
| 76 | 19:15 | 39,2 | 59,6 |
| 77 | 19:30 | 39,8 | 57,9 |
| 78 | 19:45 | 40,1 | 60,8 |
| 79 | 20:00 | 40,3 | 61,3 |
| 80 | 20:15 | 38,2 | 59,6 |
| 81 | 20:30 | 39,8 | 61,1 |
| 82 | 20:45 | 38,1 | 56,9 |
| 83 | 21:00 | 39,7 | 59,7 |
| 84 | 21:15 | 37,7 | 54,5 |
| 85 | 21:30 | 38,2 | 55,4 |
| 86 | 21:45 | 38,9 | 55,2 |
| 87 | 22:00 | 40,1 | 58,8 |
| 88 | 22:15 | 39,5 | 58,4 |
| 89 | 22:30 | 40,8 | 58,7 |
| 90 | 22:45 | 38,8 | 54,8 |
| 91 | 23:00 | 42,1 | 58,9 |
| 92 | 23:15 | 45,4 | 68,3 |
| 93 | 23:30 | 43,3 | 62,6 |
| 94 | 23:45 | 44,8 | 66,5 |
| 95 | 00:00 | 42,5 | 63,0 |
| 96 | 00:15 | 42,7 | 62,3 |

**2.GÜN**

**30.09.2022-01.10.2022**
**50.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 37,8 | 53,9 |
| 2 | 00:45 | 37,4 | 54,1 |
| 3 | 01:00 | 37,4 | 54,7 |
| 4 | 01:15 | 38,6 | 54,9 |
| 5 | 01:30 | 40,1 | 57,8 |
| 6 | 01:45 | 39,3 | 56,5 |
| 7 | 02:00 | 40,1 | 57,8 |
| 8 | 02:15 | 40,4 | 56,4 |
| 9 | 02:30 | 38,8 | 56,3 |
| 10 | 02:45 | 38,5 | 56,4 |
| 11 | 03:00 | 40,2 | 58,6 |
| 12 | 03:15 | 40,3 | 60,2 |
| 13 | 03:30 | 39,5 | 57,2 |
| 14 | 03:45 | 39,2 | 57,2 |
| 15 | 04:00 | 38,8 | 58,7 |
| 16 | 04:15 | 39,2 | 56,1 |
| 17 | 04:30 | 37,7 | 54,5 |
| 18 | 04:45 | 39,4 | 55,8 |
| 19 | 05:00 | 40,5 | 54,9 |
| 20 | 05:15 | 38,9 | 57,4 |
| 21 | 05:30 | 39,0 | 56,8 |
| 22 | 05:45 | 39,7 | 56,1 |
| 23 | 06:00 | 37,2 | 52,8 |
| 24 | 06:15 | 37,2 | 54,8 |
| 25 | 06:30 | 37,7 | 53,2 |
| 26 | 06:45 | 37,2 | 54,8 |
| 27 | 07:00 | 45,6 | 62,8 |
| 28 | 07:15 | 47,0 | 65,0 |
| 29 | 07:30 | 45,4 | 62,8 |
| 30 | 07:45 | 44,1 | 61,3 |
| 31 | 08:00 | 43,7 | 60,9 |
| 32 | 08:15 | 45,4 | 61,7 |
| 33 | 08:30 | 44,8 | 61,8 |
| 34 | 08:45 | 49,8 | 65,8 |
| 35 | 09:00 | 52,7 | 69,7 |
| 36 | 09:15 | 52,2 | 69,9 |
| 37 | 09:30 | 52,1 | 69,7 |
| 38 | 09:45 | 51,7 | 69,5 |


rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 39 | 10:00 | 52,4 | 65,6 |
| 40 | 10:15 | 51,7 | 67,9 |
| 41 | 10:30 | 52,2 | 65,9 |
| 42 | 10:45 | 49,6 | 69,9 |
| 43 | 11:00 | 51,5 | 67,3 |
| 44 | 11:15 | 52,6 | 67,9 |
| 45 | 11:30 | 51,9 | 66,6 |
| 46 | 11:45 | 52,6 | 68,4 |
| 47 | 12:00 | 51,9 | 66,4 |
| 48 | 12:15 | 49,7 | 65,5 |
| 49 | 12:30 | 53,1 | 68,8 |
| 50 | 12:45 | 51,9 | 70,5 |
| 51 | 13:00 | 50,7 | 74,5 |
| 52 | 13:15 | 50,0 | 72,0 |
| 53 | 13:30 | 50,9 | 73,2 |
| 54 | 13:45 | 52,1 | 72,7 |
| 55 | 14:00 | 50,6 | 76,2 |
| 56 | 14:15 | 52,2 | 75,0 |
| 57 | 14:30 | 49,9 | 73,6 |
| 58 | 14:45 | 51,6 | 72,5 |
| 59 | 15:00 | 49,6 | 77,9 |
| 60 | 15:15 | 52,2 | 72,6 |
| 61 | 15:30 | 48,5 | 76,3 |
| 62 | 15:45 | 50,7 | 75,0 |
| 63 | 16:00 | 48,5 | 79,1 |
| 64 | 16:15 | 48,7 | 77,3 |
| 65 | 16:30 | 51,1 | 71,0 |
| 66 | 16:45 | 51,8 | 75,6 |
| 67 | 17:00 | 54,9 | 73,5 |
| 68 | 17:15 | 51,7 | 70,8 |
| 69 | 17:30 | 50,6 | 77,9 |
| 70 | 17:45 | 51,9 | 79,3 |
| 71 | 18:00 | 50,5 | 73,1 |
| 72 | 18:15 | 49,1 | 66,3 |
| 73 | 18:30 | 47,2 | 67,9 |
| 74 | 18:45 | 45,0 | 62,8 |
| 75 | 19:00 | 43,2 | 63,3 |
| 76 | 19:15 | 39,2 | 59,6 |
| 77 | 19:30 | 39,8 | 57,9 |
| 78 | 19:45 | 40,1 | 60,8 |
| 79 | 20:00 | 40,3 | 61,3 |
| 80 | 20:15 | 38,2 | 59,6 |
| 81 | 20:30 | 39,8 | 61,1 |
| 82 | 20:45 | 38,1 | 56,9 |
| 83 | 21:00 | 39,7 | 59,7 |
| 84 | 21:15 | 37,7 | 54,5 |
| 85 | 21:30 | 38,2 | 55,4 |
| 86 | 21:45 | 38,9 | 55,2 |
| 87 | 22:00 | 40,1 | 58,8 |
| 88 | 22:15 | 39,5 | 58,4 |
| 89 | 22:30 | 40,8 | 58,7 |
| 90 | 22:45 | 38,8 | 54,8 |
| 91 | 23:00 | 42,1 | 58,9 |
| 92 | 23:15 | 45,4 | 68,3 |
| 93 | 23:30 | 43,3 | 62,6 |
| 94 | 23:45 | 44,8 | 66,5 |
| 95 | 00:00 | 42,5 | 63,0 |
| 96 | 00:15 | 42,7 | 62,3 |

**2.GÜN**
**30.09.2022-01.10.2022**
**51.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,7 | 46,5 |
| 2 | 00:45 | 40,3 | 46,1 |
| 3 | 01:00 | 40,1 | 45,0 |
| 4 | 01:15 | 39,6 | 45,8 |
| 5 | 01:30 | 42,1 | 49,5 |
| 6 | 01:45 | 42,8 | 47,8 |
| 7 | 02:00 | 42,9 | 49,0 |
| 8 | 02:15 | 46,1 | 52,6 |
| 9 | 02:30 | 42,3 | 49,0 |
| 10 | 02:45 | 41,0 | 47,4 |
| 11 | 03:00 | 41,0 | 47,9 |
| 12 | 03:15 | 43,3 | 48,4 |
| 13 | 03:30 | 43,4 | 49,9 |
| 14 | 03:45 | 41,5 | 48,1 |
| 15 | 04:00 | 43,0 | 49,2 |
| 16 | 04:15 | 40,8 | 47,3 |
| 17 | 04:30 | 44,5 | 50,5 |
| 18 | 04:45 | 42,1 | 48,4 |
| 19 | 05:00 | 39,5 | 45,5 |
| 20 | 05:15 | 40,4 | 45,7 |
| 21 | 05:30 | 37,6 | 44,1 |
| 22 | 05:45 | 36,6 | 42,8 |
| 23 | 06:00 | 38,3 | 44,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 24 | 06:15 | 40,3 | 47,7 |
| 25 | 06:30 | 39,8 | 45,4 |
| 26 | 06:45 | 40,7 | 48,4 |
| 27 | 07:00 | 44,6 | 50,9 |
| 28 | 07:15 | 43,1 | 49,6 |
| 29 | 07:30 | 45,8 | 50,4 |
| 30 | 07:45 | 45,7 | 51,3 |
| 31 | 08:00 | 46,6 | 51,5 |
| 32 | 08:15 | 48,4 | 52,1 |
| 33 | 08:30 | 49,3 | 54,9 |
| 34 | 08:45 | 49,5 | 55,8 |
| 35 | 09:00 | 52,4 | 60,0 |
| 36 | 09:15 | 54,1 | 61,7 |
| 37 | 09:30 | 51,5 | 58,9 |
| 38 | 09:45 | 48,4 | 57,0 |
| 39 | 10:00 | 49,5 | 57,7 |
| 40 | 10:15 | 50,6 | 59,2 |
| 41 | 10:30 | 52,0 | 59,6 |
| 42 | 10:45 | 48,2 | 57,7 |
| 43 | 11:00 | 48,3 | 57,6 |
| 44 | 11:15 | 51,7 | 60,0 |
| 45 | 11:30 | 49,9 | 61,8 |
| 46 | 11:45 | 53,8 | 61,9 |
| 47 | 12:00 | 48,7 | 58,2 |
| 48 | 12:15 | 54,2 | 59,4 |
| 49 | 12:30 | 54,0 | 59,0 |
| 50 | 12:45 | 53,4 | 57,2 |
| 51 | 13:00 | 52,4 | 60,5 |
| 52 | 13:15 | 52,4 | 62,1 |
| 53 | 13:30 | 53,0 | 64,4 |
| 54 | 13:45 | 54,1 | 61,3 |
| 55 | 14:00 | 52,7 | 60,9 |
| 56 | 14:15 | 52,6 | 61,6 |
| 57 | 14:30 | 53,5 | 65,1 |
| 58 | 14:45 | 52,5 | 62,5 |
| 59 | 15:00 | 51,7 | 64,6 |
| 60 | 15:15 | 52,4 | 65,9 |
| 61 | 15:30 | 53,6 | 65,5 |
| 62 | 15:45 | 51,4 | 63,3 |
| 63 | 16:00 | 52,7 | 64,4 |
| 64 | 16:15 | 50,9 | 66,1 |
| 65 | 16:30 | 52,6 | 61,5 |
| 66 | 16:45 | 50,3 | 59,8 |
| 67 | 17:00 | 54,0 | 63,1 |
| 68 | 17:15 | 52,7 | 60,9 |
| 69 | 17:30 | 52,9 | 65,1 |
| 70 | 17:45 | 53,0 | 63,5 |
| 71 | 18:00 | 53,4 | 65,0 |
| 72 | 18:15 | 50,7 | 59,6 |
| 73 | 18:30 | 46,0 | 56,3 |
| 74 | 18:45 | 48,8 | 58,3 |
| 75 | 19:00 | 48,2 | 58,7 |
| 76 | 19:15 | 46,8 | 57,8 |
| 77 | 19:30 | 51,3 | 59,4 |
| 78 | 19:45 | 52,6 | 60,6 |
| 79 | 20:00 | 48,1 | 57,4 |
| 80 | 20:15 | 46,4 | 56,7 |
| 81 | 20:30 | 46,1 | 54,8 |
| 82 | 20:45 | 43,7 | 51,8 |
| 83 | 21:00 | 44,2 | 51,8 |
| 84 | 21:15 | 42,5 | 49,9 |
| 85 | 21:30 | 45,7 | 54,4 |
| 86 | 21:45 | 45,9 | 53,1 |
| 87 | 22:00 | 43,7 | 51,8 |
| 88 | 22:15 | 45,0 | 53,5 |
| 89 | 22:30 | 42,7 | 51,9 |
| 90 | 22:45 | 46,0 | 54,6 |
| 91 | 23:00 | 44,9 | 56,7 |
| 92 | 23:15 | 46,8 | 55,6 |
| 93 | 23:30 | 43,4 | 55,3 |
| 94 | 23:45 | 41,0 | 50,4 |
| 95 | 00:00 | 40,9 | 52,0 |
| 96 | 00:15 | 43,5 | 50,7 |

**2.GÜN**
**30.09.2022-01.10.2022**
**52.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,1 | 53,9 |
| 2 | 00:45 | 39,3 | 54,9 |
| 3 | 01:00 | 39,9 | 51,5 |
| 4 | 01:15 | 41,2 | 56,2 |
| 5 | 01:30 | 43,1 | 62,9 |
| 6 | 01:45 | 43,2 | 64,0 |
| 7 | 02:00 | 41,4 | 62,7 |
| 8 | 02:15 | 43,4 | 63,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 02:30 | 39,9 | 61,8 | 53 | 13:30 | 50,8 | 65,5 |
| 10 | 02:45 | 40,3 | 60,7 | 54 | 13:45 | 50,7 | 63,1 |
| 11 | 03:00 | 40,9 | 60,5 | 55 | 14:00 | 50,1 | 66,1 |
| 12 | 03:15 | 39,8 | 62,2 | 56 | 14:15 | 50,5 | 63,9 |
| 13 | 03:30 | 41,2 | 62,3 | 57 | 14:30 | 50,6 | 65,5 |
| 14 | 03:45 | 40,0 | 62,7 | 58 | 14:45 | 50,1 | 65,7 |
| 15 | 04:00 | 40,1 | 64,0 | 59 | 15:00 | 52,0 | 63,8 |
| 16 | 04:15 | 40,7 | 63,0 | 60 | 15:15 | 51,2 | 65,7 |
| 17 | 04:30 | 39,8 | 59,6 | 61 | 15:30 | 52,0 | 65,2 |
| 18 | 04:45 | 39,0 | 60,9 | 62 | 15:45 | 50,6 | 65,0 |
| 19 | 05:00 | 41,9 | 63,1 | 63 | 16:00 | 51,8 | 64,6 |
| 20 | 05:15 | 39,7 | 60,0 | 64 | 16:15 | 50,3 | 65,5 |
| 21 | 05:30 | 41,6 | 65,0 | 65 | 16:30 | 49,0 | 63,8 |
| 22 | 05:45 | 42,2 | 61,7 | 66 | 16:45 | 49,7 | 63,5 |
| 23 | 06:00 | 37,8 | 58,3 | 67 | 17:00 | 49,9 | 65,5 |
| 24 | 06:15 | 40,1 | 59,4 | 68 | 17:15 | 50,5 | 64,5 |
| 25 | 06:30 | 40,5 | 60,3 | 69 | 17:30 | 50,7 | 66,5 |
| 26 | 06:45 | 40,1 | 59,5 | 70 | 17:45 | 49,9 | 65,0 |
| 27 | 07:00 | 44,9 | 63,8 | 71 | 18:00 | 49,5 | 66,3 |
| 28 | 07:15 | 42,5 | 60,3 | 72 | 18:15 | 44,9 | 66,8 |
| 29 | 07:30 | 42,2 | 58,8 | 73 | 18:30 | 43,7 | 67,4 |
| 30 | 07:45 | 43,2 | 59,8 | 74 | 18:45 | 40,7 | 63,3 |
| 31 | 08:00 | 42,6 | 61,5 | 75 | 19:00 | 41,9 | 64,2 |
| 32 | 08:15 | 44,9 | 62,2 | 76 | 19:15 | 37,9 | 60,5 |
| 33 | 08:30 | 45,2 | 64,5 | 77 | 19:30 | 38,2 | 60,5 |
| 34 | 08:45 | 49,7 | 63,2 | 78 | 19:45 | 40,4 | 64,2 |
| 35 | 09:00 | 50,2 | 63,8 | 79 | 20:00 | 39,8 | 64,8 |
| 36 | 09:15 | 50,6 | 62,3 | 80 | 20:15 | 39,3 | 62,9 |
| 37 | 09:30 | 50,7 | 64,4 | 81 | 20:30 | 40,6 | 66,1 |
| 38 | 09:45 | 50,7 | 63,7 | 82 | 20:45 | 42,6 | 69,7 |
| 39 | 10:00 | 48,4 | 62,9 | 83 | 21:00 | 42,0 | 67,9 |
| 40 | 10:15 | 49,1 | 65,0 | 84 | 21:15 | 41,4 | 64,4 |
| 41 | 10:30 | 48,4 | 64,0 | 85 | 21:30 | 40,3 | 65,1 |
| 42 | 10:45 | 49,1 | 65,9 | 86 | 21:45 | 42,8 | 65,1 |
| 43 | 11:00 | 49,0 | 64,4 | 87 | 22:00 | 41,8 | 63,9 |
| 44 | 11:15 | 48,4 | 62,2 | 88 | 22:15 | 43,0 | 68,1 |
| 45 | 11:30 | 49,4 | 63,7 | 89 | 22:30 | 43,7 | 68,8 |
| 46 | 11:45 | 50,5 | 65,0 | 90 | 22:45 | 42,2 | 63,9 |
| 47 | 12:00 | 48,0 | 61,6 | 91 | 23:00 | 45,0 | 62,0 |
| 48 | 12:15 | 46,9 | 65,1 | 92 | 23:15 | 48,4 | 68,2 |
| 49 | 12:30 | 48,2 | 62,8 | 93 | 23:30 | 42,9 | 62,7 |
| 50 | 12:45 | 50,7 | 64,0 | 94 | 23:45 | 42,0 | 61,7 |
| 51 | 13:00 | 51,8 | 63,2 | 95 | 00:00 | 41,7 | 64,1 |
| 52 | 13:15 | 53,1 | 67,2 | 96 | 00:15 | 43,3 | 67,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**2.GÜN**
**30.09.2022-01.10.2022**
**53.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,2 | 55,1 |
| 2 | 00:45 | 38,4 | 54,9 |
| 3 | 01:00 | 38,9 | 54,7 |
| 4 | 01:15 | 40,3 | 60,2 |
| 5 | 01:30 | 40,1 | 58,6 |
| 6 | 01:45 | 41,5 | 61,5 |
| 7 | 02:00 | 39,8 | 60,3 |
| 8 | 02:15 | 41,8 | 60,9 |
| 9 | 02:30 | 38,5 | 59,4 |
| 10 | 02:45 | 38,8 | 58,4 |
| 11 | 03:00 | 39,3 | 58,2 |
| 12 | 03:15 | 36,9 | 57,5 |
| 13 | 03:30 | 37,3 | 56,3 |
| 14 | 03:45 | 36,1 | 56,5 |
| 15 | 04:00 | 36,2 | 57,9 |
| 16 | 04:15 | 39,2 | 60,6 |
| 17 | 04:30 | 38,3 | 57,4 |
| 18 | 04:45 | 37,6 | 58,6 |
| 19 | 05:00 | 40,3 | 60,8 |
| 20 | 05:15 | 38,2 | 57,7 |
| 21 | 05:30 | 40,0 | 62,6 |
| 22 | 05:45 | 40,6 | 59,3 |
| 23 | 06:00 | 36,4 | 56,2 |
| 24 | 06:15 | 38,7 | 57,1 |
| 25 | 06:30 | 39,0 | 58,1 |
| 26 | 06:45 | 38,7 | 57,2 |
| 27 | 07:00 | 43,3 | 61,4 |
| 28 | 07:15 | 40,9 | 58,1 |
| 29 | 07:30 | 43,9 | 61,1 |
| 30 | 07:45 | 44,9 | 62,0 |
| 31 | 08:00 | 44,3 | 63,9 |
| 32 | 08:15 | 46,6 | 64,6 |
| 33 | 08:30 | 47,0 | 67,0 |
| 34 | 08:45 | 51,7 | 65,6 |
| 35 | 09:00 | 48,3 | 61,4 |
| 36 | 09:15 | 48,6 | 59,9 |
| 37 | 09:30 | 48,7 | 62,0 |
| 38 | 09:45 | 48,8 | 61,3 |
| 39 | 10:00 | 46,5 | 60,6 |
| 40 | 10:15 | 47,3 | 62,6 |
| 41 | 10:30 | 46,5 | 61,6 |
| 42 | 10:45 | 47,3 | 63,5 |
| 43 | 11:00 | 47,2 | 62,0 |
| 44 | 11:15 | 46,5 | 59,8 |
| 45 | 11:30 | 47,6 | 61,3 |
| 46 | 11:45 | 48,5 | 62,6 |
| 47 | 12:00 | 46,1 | 59,2 |
| 48 | 12:15 | 45,2 | 62,6 |
| 49 | 12:30 | 46,3 | 60,4 |
| 50 | 12:45 | 48,7 | 61,6 |
| 51 | 13:00 | 49,8 | 60,8 |
| 52 | 13:15 | 51,1 | 64,6 |
| 53 | 13:30 | 48,9 | 63,0 |
| 54 | 13:45 | 48,7 | 60,8 |
| 55 | 14:00 | 48,2 | 63,7 |
| 56 | 14:15 | 48,5 | 61,5 |
| 57 | 14:30 | 48,6 | 63,0 |
| 58 | 14:45 | 48,2 | 63,3 |
| 59 | 15:00 | 50,0 | 61,4 |
| 60 | 15:15 | 49,3 | 63,2 |
| 61 | 15:30 | 50,0 | 62,7 |
| 62 | 15:45 | 48,6 | 62,6 |
| 63 | 16:00 | 49,8 | 62,2 |
| 64 | 16:15 | 48,4 | 63,0 |
| 65 | 16:30 | 47,2 | 61,4 |
| 66 | 16:45 | 47,9 | 61,1 |
| 67 | 17:00 | 48,0 | 63,0 |
| 68 | 17:15 | 48,5 | 62,1 |
| 69 | 17:30 | 48,8 | 64,1 |
| 70 | 17:45 | 48,0 | 62,6 |
| 71 | 18:00 | 47,7 | 63,9 |
| 72 | 18:15 | 43,2 | 64,4 |
| 73 | 18:30 | 42,0 | 64,7 |
| 74 | 18:45 | 39,1 | 60,9 |
| 75 | 19:00 | 40,4 | 61,8 |
| 76 | 19:15 | 36,6 | 58,2 |
| 77 | 19:30 | 36,8 | 58,2 |
| 78 | 19:45 | 38,8 | 61,8 |
| 79 | 20:00 | 38,4 | 62,4 |
| 80 | 20:15 | 37,8 | 60,5 |
| 81 | 20:30 | 39,0 | 63,6 |
| 82 | 20:45 | 41,0 | 67,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 40,4 | 65,2 |
| 84 | 21:15 | 39,8 | 62,0 |
| 85 | 21:30 | 38,8 | 62,7 |
| 86 | 21:45 | 41,1 | 62,7 |
| 87 | 22:00 | 40,2 | 61,4 |
| 88 | 22:15 | 41,4 | 65,4 |
| 89 | 22:30 | 42,0 | 66,2 |
| 90 | 22:45 | 40,5 | 61,4 |
| 91 | 23:00 | 43,4 | 59,6 |
| 92 | 23:15 | 46,6 | 65,5 |
| 93 | 23:30 | 41,4 | 60,4 |
| 94 | 23:45 | 40,4 | 59,3 |
| 95 | 00:00 | 40,1 | 61,7 |
| 96 | 00:15 | 41,7 | 65,1 |

**2.GÜN**
**30.09.2022-01.10.2022**
**54.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 40,9 | 59,0 |
| 2 | 00:45 | 42,5 | 57,5 |
| 3 | 01:00 | 43,6 | 61,4 |
| 4 | 01:15 | 45,6 | 63,7 |
| 5 | 01:30 | 46,1 | 60,0 |
| 6 | 01:45 | 45,8 | 58,5 |
| 7 | 02:00 | 45,1 | 55,8 |
| 8 | 02:15 | 44,5 | 63,1 |
| 9 | 02:30 | 43,8 | 58,7 |
| 10 | 02:45 | 45,5 | 61,3 |
| 11 | 03:00 | 45,7 | 55,7 |
| 12 | 03:15 | 45,8 | 58,8 |
| 13 | 03:30 | 46,2 | 62,2 |
| 14 | 03:45 | 45,8 | 64,3 |
| 15 | 04:00 | 46,0 | 60,0 |
| 16 | 04:15 | 46,2 | 62,1 |
| 17 | 04:30 | 45,7 | 63,9 |
| 18 | 04:45 | 44,2 | 61,4 |
| 19 | 05:00 | 43,3 | 56,0 |
| 20 | 05:15 | 42,9 | 55,7 |
| 21 | 05:30 | 42,6 | 53,6 |
| 22 | 05:45 | 40,8 | 53,2 |
| 23 | 06:00 | 40,1 | 55,8 |
| 24 | 06:15 | 39,6 | 52,0 |
| 25 | 06:30 | 41,6 | 53,1 |
| 26 | 06:45 | 41,3 | 50,0 |
| 27 | 07:00 | 41,5 | 58,0 |
| 28 | 07:15 | 41,0 | 54,3 |
| 29 | 07:30 | 44,1 | 56,4 |
| 30 | 07:45 | 47,6 | 56,8 |
| 31 | 08:00 | 48,3 | 53,9 |
| 32 | 08:15 | 49,9 | 56,4 |
| 33 | 08:30 | 50,2 | 53,8 |
| 34 | 08:45 | 49,0 | 56,0 |
| 35 | 09:00 | 52,3 | 57,1 |
| 36 | 09:15 | 51,3 | 59,0 |
| 37 | 09:30 | 51,7 | 60,7 |
| 38 | 09:45 | 52,1 | 61,9 |
| 39 | 10:00 | 53,5 | 64,1 |
| 40 | 10:15 | 53,3 | 60,9 |
| 41 | 10:30 | 53,8 | 62,2 |
| 42 | 10:45 | 54,4 | 60,9 |
| 43 | 11:00 | 54,2 | 61,2 |
| 44 | 11:15 | 53,7 | 61,7 |
| 45 | 11:30 | 53,3 | 61,8 |
| 46 | 11:45 | 54,4 | 61,1 |
| 47 | 12:00 | 54,2 | 62,4 |
| 48 | 12:15 | 54,8 | 61,0 |
| 49 | 12:30 | 54,9 | 60,0 |
| 50 | 12:45 | 55,2 | 60,7 |
| 51 | 13:00 | 54,6 | 62,4 |
| 52 | 13:15 | 54,0 | 59,2 |
| 53 | 13:30 | 53,8 | 61,0 |
| 54 | 13:45 | 53,4 | 61,9 |
| 55 | 14:00 | 54,7 | 60,0 |
| 56 | 14:15 | 52,7 | 59,4 |
| 57 | 14:30 | 51,4 | 56,3 |
| 58 | 14:45 | 51,7 | 57,8 |
| 59 | 15:00 | 52,1 | 59,9 |
| 60 | 15:15 | 53,7 | 63,9 |
| 61 | 15:30 | 52,2 | 64,0 |
| 62 | 15:45 | 51,9 | 57,7 |
| 63 | 16:00 | 52,4 | 62,2 |
| 64 | 16:15 | 51,6 | 59,7 |
| 65 | 16:30 | 52,0 | 61,3 |
| 66 | 16:45 | 52,6 | 60,3 |
| 67 | 17:00 | 53,4 | 61,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 68 | 17:15 | 52,9 | 58,4 |
| 69 | 17:30 | 51,7 | 61,4 |
| 70 | 17:45 | 53,7 | 62,8 |
| 71 | 18:00 | 52,2 | 60,9 |
| 72 | 18:15 | 52,0 | 60,3 |
| 73 | 18:30 | 52,3 | 60,7 |
| 74 | 18:45 | 53,5 | 61,9 |
| 75 | 19:00 | 52,9 | 62,5 |
| 76 | 19:15 | 52,6 | 57,6 |
| 77 | 19:30 | 53,2 | 63,7 |
| 78 | 19:45 | 52,9 | 65,2 |
| 79 | 20:00 | 54,2 | 59,8 |
| 80 | 20:15 | 47,0 | 61,3 |
| 81 | 20:30 | 43,9 | 63,1 |
| 82 | 20:45 | 41,7 | 59,2 |
| 83 | 21:00 | 41,1 | 53,5 |
| 84 | 21:15 | 41,8 | 55,5 |
| 85 | 21:30 | 42,2 | 57,5 |
| 86 | 21:45 | 41,6 | 56,9 |
| 87 | 22:00 | 41,6 | 55,4 |
| 88 | 22:15 | 41,7 | 56,1 |
| 89 | 22:30 | 41,8 | 57,8 |
| 90 | 22:45 | 42,0 | 61,0 |
| 91 | 23:00 | 42,7 | 58,7 |
| 92 | 23:15 | 42,5 | 56,8 |
| 93 | 23:30 | 40,0 | 59,6 |
| 94 | 23:45 | 39,1 | 56,7 |
| 95 | 00:00 | 40,5 | 60,2 |
| 96 | 00:15 | 38,8 | 57,3 |

**2.GÜN**
**30.09.2022-01.10.2022**
**55.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 34,6 | 53,7 |
| 2 | 00:45 | 36,3 | 54,5 |
| 3 | 01:00 | 38,4 | 56,3 |
| 4 | 01:15 | 39,7 | 56,7 |
| 5 | 01:30 | 40,4 | 58,3 |
| 6 | 01:45 | 40,6 | 58,3 |
| 7 | 02:00 | 38,8 | 56,1 |
| 8 | 02:15 | 40,8 | 57,1 |
| 9 | 02:30 | 36,4 | 52,6 |
| 10 | 02:45 | 36,7 | 53,6 |
| 11 | 03:00 | 37,3 | 54,3 |
| 12 | 03:15 | 36,3 | 53,9 |
| 13 | 03:30 | 39,0 | 58,0 |
| 14 | 03:45 | 38,5 | 57,0 |
| 15 | 04:00 | 37,1 | 55,3 |
| 16 | 04:15 | 37,1 | 57,3 |
| 17 | 04:30 | 37,9 | 55,3 |
| 18 | 04:45 | 36,9 | 54,5 |
| 19 | 05:00 | 38,7 | 55,9 |
| 20 | 05:15 | 37,4 | 54,8 |
| 21 | 05:30 | 37,7 | 55,2 |
| 22 | 05:45 | 38,2 | 54,5 |
| 23 | 06:00 | 35,7 | 49,0 |
| 24 | 06:15 | 35,9 | 50,3 |
| 25 | 06:30 | 36,3 | 51,4 |
| 26 | 06:45 | 35,9 | 51,3 |
| 27 | 07:00 | 39,8 | 55,2 |
| 28 | 07:15 | 40,9 | 55,0 |
| 29 | 07:30 | 39,8 | 53,0 |
| 30 | 07:45 | 42,6 | 52,8 |
| 31 | 08:00 | 42,6 | 52,9 |
| 32 | 08:15 | 46,8 | 57,7 |
| 33 | 08:30 | 47,8 | 59,0 |
| 34 | 08:45 | 48,8 | 63,8 |
| 35 | 09:00 | 49,2 | 66,9 |
| 36 | 09:15 | 50,5 | 69,7 |
| 37 | 09:30 | 49,9 | 66,9 |
| 38 | 09:45 | 50,3 | 67,2 |
| 39 | 10:00 | 51,3 | 63,8 |
| 40 | 10:15 | 49,1 | 64,8 |
| 41 | 10:30 | 49,8 | 63,4 |
| 42 | 10:45 | 48,9 | 65,4 |
| 43 | 11:00 | 49,7 | 64,7 |
| 44 | 11:15 | 48,4 | 68,5 |
| 45 | 11:30 | 50,8 | 65,7 |
| 46 | 11:45 | 51,1 | 71,5 |
| 47 | 12:00 | 51,5 | 63,5 |
| 48 | 12:15 | 50,7 | 68,2 |
| 49 | 12:30 | 51,1 | 66,4 |
| 50 | 12:45 | 48,8 | 67,7 |
| 51 | 13:00 | 49,2 | 67,7 |
| 52 | 13:15 | 47,9 | 73,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 53 | 13:30 | 48,8 | 67,2 |
| 54 | 13:45 | 49,2 | 67,5 |
| 55 | 14:00 | 49,0 | 65,0 |
| 56 | 14:15 | 46,8 | 66,9 |
| 57 | 14:30 | 50,4 | 65,5 |
| 58 | 14:45 | 52,7 | 64,4 |
| 59 | 15:00 | 51,0 | 70,0 |
| 60 | 15:15 | 51,8 | 66,7 |
| 61 | 15:30 | 49,6 | 69,1 |
| 62 | 15:45 | 50,7 | 68,5 |
| 63 | 16:00 | 49,7 | 70,3 |
| 64 | 16:15 | 52,9 | 69,2 |
| 65 | 16:30 | 51,8 | 66,4 |
| 66 | 16:45 | 51,4 | 65,4 |
| 67 | 17:00 | 50,7 | 68,7 |
| 68 | 17:15 | 48,8 | 63,5 |
| 69 | 17:30 | 49,3 | 68,4 |
| 70 | 17:45 | 47,9 | 67,1 |
| 71 | 18:00 | 48,5 | 68,4 |
| 72 | 18:15 | 46,7 | 62,8 |
| 73 | 18:30 | 47,3 | 61,4 |
| 74 | 18:45 | 46,4 | 61,0 |
| 75 | 19:00 | 44,8 | 59,8 |
| 76 | 19:15 | 43,0 | 55,7 |
| 77 | 19:30 | 41,8 | 56,5 |
| 78 | 19:45 | 39,0 | 59,8 |
| 79 | 20:00 | 37,6 | 57,8 |
| 80 | 20:15 | 36,9 | 57,9 |
| 81 | 20:30 | 38,7 | 60,0 |
| 82 | 20:45 | 37,5 | 56,5 |
| 83 | 21:00 | 36,9 | 55,4 |
| 84 | 21:15 | 38,4 | 53,6 |
| 85 | 21:30 | 39,0 | 54,4 |
| 86 | 21:45 | 39,4 | 55,9 |
| 87 | 22:00 | 38,7 | 56,6 |
| 88 | 22:15 | 39,6 | 58,5 |
| 89 | 22:30 | 40,4 | 58,2 |
| 90 | 22:45 | 38,5 | 54,4 |
| 91 | 23:00 | 41,6 | 58,3 |
| 92 | 23:15 | 41,9 | 63,2 |
| 93 | 23:30 | 41,2 | 60,9 |
| 94 | 23:45 | 39,5 | 55,3 |
| 95 | 00:00 | 40,8 | 51,3 |
| 96 | 00:15 | 42,4 | 53,7 |

**2.GÜN**
**30.09.2022-01.10.2022**
**56.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,1 | 52,8 |
| 2 | 00:45 | 44,3 | 52,0 |
| 3 | 01:00 | 45,5 | 54,5 |
| 4 | 01:15 | 41,1 | 47,0 |
| 5 | 01:30 | 42,8 | 50,7 |
| 6 | 01:45 | 41,3 | 50,5 |
| 7 | 02:00 | 42,0 | 49,5 |
| 8 | 02:15 | 45,4 | 55,2 |
| 9 | 02:30 | 42,8 | 50,5 |
| 10 | 02:45 | 43,3 | 49,9 |
| 11 | 03:00 | 43,1 | 52,2 |
| 12 | 03:15 | 45,8 | 53,0 |
| 13 | 03:30 | 44,8 | 56,1 |
| 14 | 03:45 | 44,8 | 54,6 |
| 15 | 04:00 | 44,6 | 54,4 |
| 16 | 04:15 | 44,3 | 54,7 |
| 17 | 04:30 | 46,1 | 54,6 |
| 18 | 04:45 | 42,4 | 52,5 |
| 19 | 05:00 | 45,0 | 55,4 |
| 20 | 05:15 | 41,1 | 49,7 |
| 21 | 05:30 | 42,5 | 53,5 |
| 22 | 05:45 | 41,4 | 50,2 |
| 23 | 06:00 | 39,7 | 49,6 |
| 24 | 06:15 | 40,8 | 50,1 |
| 25 | 06:30 | 44,2 | 53,6 |
| 26 | 06:45 | 43,4 | 53,4 |
| 27 | 07:00 | 44,0 | 53,7 |
| 28 | 07:15 | 45,8 | 55,3 |
| 29 | 07:30 | 44,9 | 56,3 |
| 30 | 07:45 | 49,2 | 57,8 |
| 31 | 08:00 | 52,8 | 59,1 |
| 32 | 08:15 | 52,9 | 61,5 |
| 33 | 08:30 | 52,2 | 61,6 |
| 34 | 08:45 | 52,4 | 63,0 |
| 35 | 09:00 | 54,3 | 62,1 |
| 36 | 09:15 | 55,2 | 66,1 |
| 37 | 09:30 | 54,5 | 63,0 |


rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 38 | 09:45 | 53,0 | 59,4 |
| 39 | 10:00 | 51,3 | 58,5 |
| 40 | 10:15 | 54,0 | 62,6 |
| 41 | 10:30 | 52,7 | 62,3 |
| 42 | 10:45 | 51,3 | 56,7 |
| 43 | 11:00 | 52,1 | 59,7 |
| 44 | 11:15 | 52,7 | 61,1 |
| 45 | 11:30 | 53,4 | 62,2 |
| 46 | 11:45 | 54,1 | 62,5 |
| 47 | 12:00 | 49,3 | 57,6 |
| 48 | 12:15 | 53,1 | 59,6 |
| 49 | 12:30 | 53,7 | 61,4 |
| 50 | 12:45 | 54,1 | 59,3 |
| 51 | 13:00 | 53,3 | 58,6 |
| 52 | 13:15 | 53,5 | 59,4 |
| 53 | 13:30 | 55,1 | 59,6 |
| 54 | 13:45 | 52,7 | 58,6 |
| 55 | 14:00 | 52,6 | 58,9 |
| 56 | 14:15 | 53,6 | 60,5 |
| 57 | 14:30 | 54,5 | 60,2 |
| 58 | 14:45 | 51,2 | 56,0 |
| 59 | 15:00 | 51,4 | 58,0 |
| 60 | 15:15 | 53,9 | 59,8 |
| 61 | 15:30 | 52,5 | 59,6 |
| 62 | 15:45 | 49,8 | 55,1 |
| 63 | 16:00 | 50,2 | 56,7 |
| 64 | 16:15 | 51,4 | 57,8 |
| 65 | 16:30 | 50,8 | 56,1 |
| 66 | 16:45 | 49,0 | 54,9 |
| 67 | 17:00 | 47,9 | 55,0 |
| 68 | 17:15 | 50,0 | 56,6 |
| 69 | 17:30 | 52,2 | 59,5 |
| 70 | 17:45 | 55,1 | 62,4 |
| 71 | 18:00 | 51,6 | 61,5 |
| 72 | 18:15 | 52,6 | 63,0 |
| 73 | 18:30 | 50,5 | 60,0 |
| 74 | 18:45 | 50,7 | 59,7 |
| 75 | 19:00 | 51,2 | 61,5 |
| 76 | 19:15 | 50,1 | 58,4 |
| 77 | 19:30 | 52,6 | 59,4 |
| 78 | 19:45 | 53,4 | 61,9 |
| 79 | 20:00 | 50,7 | 57,7 |
| 80 | 20:15 | 50,1 | 58,8 |
| 81 | 20:30 | 46,4 | 55,9 |
| 82 | 20:45 | 47,2 | 54,5 |
| 83 | 21:00 | 48,1 | 56,8 |
| 84 | 21:15 | 46,3 | 54,6 |
| 85 | 21:30 | 48,5 | 56,0 |
| 86 | 21:45 | 47,1 | 56,3 |
| 87 | 22:00 | 44,8 | 53,5 |
| 88 | 22:15 | 45,9 | 54,5 |
| 89 | 22:30 | 44,7 | 53,1 |
| 90 | 22:45 | 47,4 | 56,1 |
| 91 | 23:00 | 45,3 | 52,9 |
| 92 | 23:15 | 44,5 | 53,0 |
| 93 | 23:30 | 42,8 | 49,2 |
| 94 | 23:45 | 43,4 | 52,3 |
| 95 | 00:00 | 42,8 | 51,2 |
| 96 | 00:15 | 44,7 | 53,6 |

**2.GÜN**
**30.09.2022-01.10.2022**
**57.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,0 | 52,8 |
| 2 | 00:45 | 42,1 | 52,5 |
| 3 | 01:00 | 44,1 | 51,5 |
| 4 | 01:15 | 42,9 | 53,2 |
| 5 | 01:30 | 42,8 | 51,8 |
| 6 | 01:45 | 42,8 | 52,7 |
| 7 | 02:00 | 44,0 | 55,1 |
| 8 | 02:15 | 46,0 | 55,6 |
| 9 | 02:30 | 41,1 | 52,7 |
| 10 | 02:45 | 41,5 | 51,9 |
| 11 | 03:00 | 42,1 | 51,7 |
| 12 | 03:15 | 41,0 | 53,2 |
| 13 | 03:30 | 42,9 | 55,0 |
| 14 | 03:45 | 41,1 | 54,7 |
| 15 | 04:00 | 41,2 | 55,8 |
| 16 | 04:15 | 41,9 | 55,0 |
| 17 | 04:30 | 41,0 | 52,0 |
| 18 | 04:45 | 40,1 | 53,0 |
| 19 | 05:00 | 42,9 | 55,1 |
| 20 | 05:15 | 40,7 | 52,4 |
| 21 | 05:30 | 42,7 | 56,9 |
| 22 | 05:45 | 43,4 | 53,8 |
| 23 | 06:00 | 38,8 | 51,1 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 24 | 06:15 | 38,6 | 48,4 |
| 25 | 06:30 | 41,2 | 51,8 |
| 26 | 06:45 | 39,4 | 49,5 |
| 27 | 07:00 | 45,7 | 54,9 |
| 28 | 07:15 | 45,4 | 54,9 |
| 29 | 07:30 | 44,7 | 53,1 |
| 30 | 07:45 | 47,7 | 52,7 |
| 31 | 08:00 | 47,7 | 54,2 |
| 32 | 08:15 | 49,1 | 58,8 |
| 33 | 08:30 | 48,2 | 59,9 |
| 34 | 08:45 | 46,0 | 59,2 |
| 35 | 09:00 | 47,6 | 60,6 |
| 36 | 09:15 | 49,2 | 61,4 |
| 37 | 09:30 | 49,6 | 61,1 |
| 38 | 09:45 | 51,1 | 61,5 |
| 39 | 10:00 | 51,4 | 60,6 |
| 40 | 10:15 | 51,5 | 62,7 |
| 41 | 10:30 | 50,7 | 61,9 |
| 42 | 10:45 | 50,1 | 62,6 |
| 43 | 11:00 | 49,4 | 60,5 |
| 44 | 11:15 | 51,8 | 61,3 |
| 45 | 11:30 | 51,2 | 59,2 |
| 46 | 11:45 | 52,8 | 64,1 |
| 47 | 12:00 | 53,1 | 55,6 |
| 48 | 12:15 | 51,9 | 62,8 |
| 49 | 12:30 | 52,5 | 60,4 |
| 50 | 12:45 | 52,2 | 61,9 |
| 51 | 13:00 | 50,1 | 57,2 |
| 52 | 13:15 | 51,4 | 63,9 |
| 53 | 13:30 | 49,7 | 61,0 |
| 54 | 13:45 | 51,2 | 57,7 |
| 55 | 14:00 | 51,6 | 58,1 |
| 56 | 14:15 | 54,0 | 58,4 |
| 57 | 14:30 | 51,6 | 57,0 |
| 58 | 14:45 | 51,2 | 57,3 |
| 59 | 15:00 | 53,3 | 61,7 |
| 60 | 15:15 | 50,1 | 60,0 |
| 61 | 15:30 | 51,8 | 60,7 |
| 62 | 15:45 | 53,0 | 59,4 |
| 63 | 16:00 | 49,7 | 59,0 |
| 64 | 16:15 | 53,1 | 60,4 |
| 65 | 16:30 | 52,3 | 58,3 |
| 66 | 16:45 | 50,8 | 55,1 |
| 67 | 17:00 | 50,9 | 56,9 |
| 68 | 17:15 | 51,9 | 56,6 |
| 69 | 17:30 | 49,6 | 59,6 |
| 70 | 17:45 | 49,2 | 58,3 |
| 71 | 18:00 | 45,8 | 59,5 |
| 72 | 18:15 | 45,3 | 61,0 |
| 73 | 18:30 | 41,9 | 58,5 |
| 74 | 18:45 | 40,6 | 57,3 |
| 75 | 19:00 | 40,3 | 55,8 |
| 76 | 19:15 | 36,5 | 52,7 |
| 77 | 19:30 | 38,2 | 54,8 |
| 78 | 19:45 | 41,1 | 59,2 |
| 79 | 20:00 | 38,4 | 56,7 |
| 80 | 20:15 | 37,9 | 55,0 |
| 81 | 20:30 | 37,8 | 55,7 |
| 82 | 20:45 | 39,5 | 58,8 |
| 83 | 21:00 | 39,4 | 57,1 |
| 84 | 21:15 | 38,7 | 54,3 |
| 85 | 21:30 | 37,9 | 55,0 |
| 86 | 21:45 | 40,2 | 55,0 |
| 87 | 22:00 | 39,3 | 53,8 |
| 88 | 22:15 | 40,4 | 57,3 |
| 89 | 22:30 | 41,0 | 57,9 |
| 90 | 22:45 | 39,5 | 53,8 |
| 91 | 23:00 | 42,4 | 52,1 |
| 92 | 23:15 | 45,4 | 57,4 |
| 93 | 23:30 | 40,3 | 52,8 |
| 94 | 23:45 | 42,6 | 56,0 |
| 95 | 00:00 | 42,3 | 58,4 |
| 96 | 00:15 | 41,1 | 57,8 |

**2.GÜN**
**30.09.2022-01.10.2022**
**58.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 39,0 | 56,5 |
| 2 | 00:45 | 38,6 | 56,3 |
| 3 | 01:00 | 39,8 | 56,0 |
| 4 | 01:15 | 41,4 | 61,5 |
| 5 | 01:30 | 41,2 | 60,1 |
| 6 | 01:45 | 41,3 | 61,1 |
| 7 | 02:00 | 41,5 | 62,7 |
| 8 | 02:15 | 41,5 | 60,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 9 | 02:30 | 38,4 | 59,3 | 53 | 13:30 | 52,1 | 67,0 |
| 10 | 02:45 | 38,8 | 58,3 | 54 | 13:45 | 51,9 | 64,6 |
| 11 | 03:00 | 39,2 | 58,2 | 55 | 14:00 | 51,2 | 67,7 |
| 12 | 03:15 | 38,3 | 59,7 | 56 | 14:15 | 51,6 | 65,4 |
| 13 | 03:30 | 38,6 | 58,6 | 57 | 14:30 | 51,8 | 67,0 |
| 14 | 03:45 | 37,5 | 58,7 | 58 | 14:45 | 51,2 | 67,4 |
| 15 | 04:00 | 37,6 | 60,1 | 59 | 15:00 | 53,4 | 65,2 |
| 16 | 04:15 | 38,3 | 59,1 | 60 | 15:15 | 52,5 | 67,2 |
| 17 | 04:30 | 37,4 | 55,9 | 61 | 15:30 | 53,4 | 66,7 |
| 18 | 04:45 | 39,0 | 61,1 | 62 | 15:45 | 51,8 | 66,5 |
| 19 | 05:00 | 39,8 | 60,2 | 63 | 16:00 | 53,1 | 66,1 |
| 20 | 05:15 | 39,3 | 59,4 | 64 | 16:15 | 51,5 | 67,0 |
| 21 | 05:30 | 39,5 | 62,1 | 65 | 16:30 | 50,1 | 65,2 |
| 22 | 05:45 | 40,2 | 58,7 | 66 | 16:45 | 50,9 | 65,1 |
| 23 | 06:00 | 37,5 | 58,0 | 67 | 17:00 | 51,0 | 67,0 |
| 24 | 06:15 | 37,8 | 55,7 | 68 | 17:15 | 51,6 | 66,0 |
| 25 | 06:30 | 38,1 | 56,7 | 69 | 17:30 | 51,9 | 68,0 |
| 26 | 06:45 | 37,8 | 55,8 | 70 | 17:45 | 51,0 | 66,5 |
| 27 | 07:00 | 42,2 | 59,9 | 71 | 18:00 | 50,7 | 67,9 |
| 28 | 07:15 | 43,4 | 61,7 | 72 | 18:15 | 46,0 | 68,4 |
| 29 | 07:30 | 43,2 | 60,2 | 73 | 18:30 | 44,7 | 68,9 |
| 30 | 07:45 | 44,2 | 61,2 | 74 | 18:45 | 41,7 | 64,7 |
| 31 | 08:00 | 43,6 | 62,8 | 75 | 19:00 | 42,9 | 65,7 |
| 32 | 08:15 | 46,0 | 63,7 | 76 | 19:15 | 38,9 | 62,0 |
| 33 | 08:30 | 46,3 | 66,0 | 77 | 19:30 | 39,0 | 62,0 |
| 34 | 08:45 | 51,0 | 64,6 | 78 | 19:45 | 41,4 | 65,7 |
| 35 | 09:00 | 51,5 | 65,4 | 79 | 20:00 | 40,8 | 66,4 |
| 36 | 09:15 | 51,8 | 63,8 | 80 | 20:15 | 40,2 | 64,3 |
| 37 | 09:30 | 51,8 | 65,9 | 81 | 20:30 | 40,0 | 65,2 |
| 38 | 09:45 | 51,9 | 65,1 | 82 | 20:45 | 40,5 | 66,4 |
| 39 | 10:00 | 49,5 | 64,5 | 83 | 21:00 | 39,9 | 64,6 |
| 40 | 10:15 | 50,4 | 66,5 | 84 | 21:15 | 39,3 | 61,4 |
| 41 | 10:30 | 49,5 | 65,6 | 85 | 21:30 | 38,5 | 62,1 |
| 42 | 10:45 | 50,4 | 67,5 | 86 | 21:45 | 40,5 | 61,8 |
| 43 | 11:00 | 50,2 | 65,9 | 87 | 22:00 | 39,7 | 60,7 |
| 44 | 11:15 | 49,5 | 63,7 | 88 | 22:15 | 40,8 | 64,6 |
| 45 | 11:30 | 50,6 | 65,1 | 89 | 22:30 | 41,5 | 65,2 |
| 46 | 11:45 | 51,7 | 66,5 | 90 | 22:45 | 39,9 | 60,7 |
| 47 | 12:00 | 49,0 | 63,1 | 91 | 23:00 | 42,8 | 58,7 |
| 48 | 12:15 | 48,0 | 66,6 | 92 | 23:15 | 46,0 | 64,6 |
| 49 | 12:30 | 49,1 | 64,2 | 93 | 23:30 | 43,4 | 63,5 |
| 50 | 12:45 | 51,8 | 65,6 | 94 | 23:45 | 42,6 | 62,5 |
| 51 | 13:00 | 53,0 | 64,6 | 95 | 00:00 | 42,2 | 65,0 |
| 52 | 13:15 | 54,3 | 68,6 | 96 | 00:15 | 41,0 | 64,3 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

**2.GÜN**
**30.09.2022-01.10.2022**
**59.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,8 | 51,6 |
| 2 | 00:45 | 41,4 | 52,4 |
| 3 | 01:00 | 43,5 | 54,4 |
| 4 | 01:15 | 38,9 | 47,3 |
| 5 | 01:30 | 41,8 | 50,4 |
| 6 | 01:45 | 40,0 | 47,7 |
| 7 | 02:00 | 41,6 | 49,2 |
| 8 | 02:15 | 44,5 | 52,7 |
| 9 | 02:30 | 40,6 | 50,3 |
| 10 | 02:45 | 41,2 | 49,8 |
| 11 | 03:00 | 42,9 | 52,5 |
| 12 | 03:15 | 43,1 | 53,8 |
| 13 | 03:30 | 43,8 | 54,1 |
| 14 | 03:45 | 45,0 | 55,2 |
| 15 | 04:00 | 44,7 | 54,6 |
| 16 | 04:15 | 43,4 | 52,7 |
| 17 | 04:30 | 45,3 | 53,1 |
| 18 | 04:45 | 42,2 | 51,0 |
| 19 | 05:00 | 46,0 | 55,7 |
| 20 | 05:15 | 40,2 | 49,8 |
| 21 | 05:30 | 42,9 | 53,1 |
| 22 | 05:45 | 41,2 | 49,5 |
| 23 | 06:00 | 38,4 | 52,0 |
| 24 | 06:15 | 41,6 | 50,4 |
| 25 | 06:30 | 43,5 | 53,0 |
| 26 | 06:45 | 42,0 | 50,6 |
| 27 | 07:00 | 44,3 | 53,5 |
| 28 | 07:15 | 46,1 | 55,3 |
| 29 | 07:30 | 46,7 | 55,8 |
| 30 | 07:45 | 49,1 | 55,8 |
| 31 | 08:00 | 48,4 | 56,7 |
| 32 | 08:15 | 50,7 | 59,4 |
| 33 | 08:30 | 48,9 | 59,0 |
| 34 | 08:45 | 51,4 | 58,4 |
| 35 | 09:00 | 51,0 | 61,3 |
| 36 | 09:15 | 52,4 | 65,0 |
| 37 | 09:30 | 50,4 | 63,3 |
| 38 | 09:45 | 51,5 | 61,2 |
| 39 | 10:00 | 51,2 | 61,8 |
| 40 | 10:15 | 49,4 | 63,8 |
| 41 | 10:30 | 49,3 | 63,0 |
| 42 | 10:45 | 51,6 | 60,7 |
| 43 | 11:00 | 50,7 | 62,4 |
| 44 | 11:15 | 49,3 | 61,3 |
| 45 | 11:30 | 50,4 | 61,1 |
| 46 | 11:45 | 49,9 | 57,7 |
| 47 | 12:00 | 51,2 | 59,1 |
| 48 | 12:15 | 48,8 | 56,2 |
| 49 | 12:30 | 50,1 | 56,7 |
| 50 | 12:45 | 50,4 | 57,3 |
| 51 | 13:00 | 48,7 | 57,5 |
| 52 | 13:15 | 50,6 | 57,6 |
| 53 | 13:30 | 50,1 | 57,3 |
| 54 | 13:45 | 48,5 | 56,8 |
| 55 | 14:00 | 48,4 | 53,7 |
| 56 | 14:15 | 46,3 | 56,0 |
| 57 | 14:30 | 49,6 | 56,4 |
| 58 | 14:45 | 46,8 | 52,6 |
| 59 | 15:00 | 47,4 | 53,9 |
| 60 | 15:15 | 49,8 | 56,5 |
| 61 | 15:30 | 48,6 | 54,6 |
| 62 | 15:45 | 46,8 | 52,9 |
| 63 | 16:00 | 46,3 | 53,0 |
| 64 | 16:15 | 49,4 | 54,2 |
| 65 | 16:30 | 47,8 | 52,8 |
| 66 | 16:45 | 45,3 | 54,3 |
| 67 | 17:00 | 46,0 | 54,9 |
| 68 | 17:15 | 45,2 | 55,7 |
| 69 | 17:30 | 46,4 | 52,4 |
| 70 | 17:45 | 49,3 | 56,0 |
| 71 | 18:00 | 46,8 | 56,9 |
| 72 | 18:15 | 46,8 | 57,0 |
| 73 | 18:30 | 46,0 | 55,9 |
| 74 | 18:45 | 45,3 | 55,2 |
| 75 | 19:00 | 47,3 | 55,8 |
| 76 | 19:15 | 45,0 | 54,7 |
| 77 | 19:30 | 47,0 | 58,1 |
| 78 | 19:45 | 47,9 | 57,8 |
| 79 | 20:00 | 45,1 | 54,1 |
| 80 | 20:15 | 45,2 | 53,2 |
| 81 | 20:30 | 42,4 | 50,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 82 | 20:45 | 41,9 | 49,9 |
| 83 | 21:00 | 41,7 | 51,3 |
| 84 | 21:15 | 42,0 | 49,4 |
| 85 | 21:30 | 43,4 | 50,7 |
| 86 | 21:45 | 42,0 | 51,4 |
| 87 | 22:00 | 39,8 | 48,5 |
| 88 | 22:15 | 42,5 | 49,3 |
| 89 | 22:30 | 39,2 | 48,7 |
| 90 | 22:45 | 41,9 | 51,6 |
| 91 | 23:00 | 39,6 | 48,3 |
| 92 | 23:15 | 39,1 | 48,6 |
| 93 | 23:30 | 37,5 | 44,8 |
| 94 | 23:45 | 39,0 | 47,9 |
| 95 | 00:00 | 37,4 | 45,1 |
| 96 | 00:15 | 39,0 | 47,1 |

**2.GÜN**
**30.09.2022-01.10.2022**
**60.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,2 | 56,4 |
| 2 | 00:45 | 44,1 | 55,2 |
| 3 | 01:00 | 43,2 | 57,0 |
| 4 | 01:15 | 42,9 | 55,7 |
| 5 | 01:30 | 42,9 | 56,5 |
| 6 | 01:45 | 44,1 | 59,2 |
| 7 | 02:00 | 39,9 | 60,0 |
| 8 | 02:15 | 41,0 | 56,6 |
| 9 | 02:30 | 41,4 | 55,7 |
| 10 | 02:45 | 41,9 | 55,4 |
| 11 | 03:00 | 40,9 | 57,0 |
| 12 | 03:15 | 42,7 | 59,1 |
| 13 | 03:30 | 41,1 | 58,6 |
| 14 | 03:45 | 41,1 | 59,9 |
| 15 | 04:00 | 41,8 | 59,0 |
| 16 | 04:15 | 41,0 | 56,0 |
| 17 | 04:30 | 40,2 | 57,1 |
| 18 | 04:45 | 43,1 | 59,1 |
| 19 | 05:00 | 40,9 | 56,1 |
| 20 | 05:15 | 42,8 | 61,1 |
| 21 | 05:30 | 43,5 | 57,7 |
| 22 | 05:45 | 38,9 | 54,7 |
| 23 | 06:00 | 38,6 | 52,0 |
| 24 | 06:15 | 41,2 | 55,4 |
| 25 | 06:30 | 39,4 | 53,2 |
| 26 | 06:45 | 45,7 | 58,9 |
| 27 | 07:00 | 45,8 | 59,0 |
| 28 | 07:15 | 44,8 | 56,8 |
| 29 | 07:30 | 47,8 | 56,6 |
| 30 | 07:45 | 47,1 | 58,1 |
| 31 | 08:00 | 49,7 | 63,3 |
| 32 | 08:15 | 46,9 | 64,2 |
| 33 | 08:30 | 52,0 | 63,6 |
| 34 | 08:45 | 53,2 | 65,1 |
| 35 | 09:00 | 51,5 | 66,1 |
| 36 | 09:15 | 53,4 | 65,4 |
| 37 | 09:30 | 51,6 | 65,9 |
| 38 | 09:45 | 52,1 | 65,2 |
| 39 | 10:00 | 52,9 | 67,1 |
| 40 | 10:15 | 52,1 | 66,3 |
| 41 | 10:30 | 52,0 | 67,0 |
| 42 | 10:45 | 51,3 | 64,7 |
| 43 | 11:00 | 53,3 | 66,0 |
| 44 | 11:15 | 51,2 | 63,4 |
| 45 | 11:30 | 53,4 | 68,6 |
| 46 | 11:45 | 50,1 | 62,0 |
| 47 | 12:00 | 52,2 | 69,8 |
| 48 | 12:15 | 53,5 | 67,3 |
| 49 | 12:30 | 52,3 | 68,7 |
| 50 | 12:45 | 54,2 | 63,6 |
| 51 | 13:00 | 51,0 | 67,8 |
| 52 | 13:15 | 53,5 | 67,9 |
| 53 | 13:30 | 54,1 | 64,3 |
| 54 | 13:45 | 51,3 | 64,6 |
| 55 | 14:00 | 53,8 | 65,0 |
| 56 | 14:15 | 51,4 | 63,6 |
| 57 | 14:30 | 50,9 | 63,8 |
| 58 | 14:45 | 53,0 | 62,0 |
| 59 | 15:00 | 51,3 | 66,7 |
| 60 | 15:15 | 52,2 | 67,6 |
| 61 | 15:30 | 53,9 | 66,2 |
| 62 | 15:45 | 53,4 | 65,9 |
| 63 | 16:00 | 51,1 | 67,2 |
| 64 | 16:15 | 52,3 | 65,0 |
| 65 | 16:30 | 50,4 | 61,5 |
| 66 | 16:45 | 50,6 | 63,4 |
| 67 | 17:00 | 49,3 | 63,2 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mührsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 68 | 17:15 | 49,7 | 66,4 |
| 69 | 17:30 | 48,1 | 64,8 |
| 70 | 17:45 | 48,8 | 66,2 |
| 71 | 18:00 | 45,1 | 67,9 |
| 72 | 18:15 | 41,6 | 65,1 |
| 73 | 18:30 | 40,5 | 63,6 |
| 74 | 18:45 | 40,0 | 62,1 |
| 75 | 19:00 | 36,3 | 58,5 |
| 76 | 19:15 | 37,9 | 61,0 |
| 77 | 19:30 | 40,9 | 65,8 |
| 78 | 19:45 | 38,2 | 63,0 |
| 79 | 20:00 | 37,8 | 61,1 |
| 80 | 20:15 | 37,5 | 61,9 |
| 81 | 20:30 | 39,4 | 65,3 |
| 82 | 20:45 | 39,3 | 63,6 |
| 83 | 21:00 | 38,6 | 60,4 |
| 84 | 21:15 | 37,7 | 61,1 |
| 85 | 21:30 | 39,8 | 61,1 |
| 86 | 21:45 | 39,0 | 59,9 |
| 87 | 22:00 | 40,1 | 63,8 |
| 88 | 22:15 | 40,8 | 64,4 |
| 89 | 22:30 | 39,4 | 59,9 |
| 90 | 22:45 | 42,2 | 57,9 |
| 91 | 23:00 | 45,2 | 63,8 |
| 92 | 23:15 | 40,3 | 58,7 |
| 93 | 23:30 | 42,5 | 62,5 |
| 94 | 23:45 | 42,0 | 64,9 |
| 95 | 00:00 | 40,8 | 62,8 |
| 96 | 00:15 | 40,7 | 60,6 |

**2.GÜN**
**30.09.2022-01.10.2022**
**61.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,6 | 50,5 |
| 2 | 00:45 | 38,7 | 50,3 |
| 3 | 01:00 | 39,3 | 50,0 |
| 4 | 01:15 | 40,8 | 54,9 |
| 5 | 01:30 | 40,6 | 53,7 |
| 6 | 01:45 | 40,7 | 54,5 |
| 7 | 02:00 | 41,0 | 56,0 |
| 8 | 02:15 | 40,9 | 53,9 |
| 9 | 02:30 | 37,9 | 52,9 |
| 10 | 02:45 | 38,3 | 52,0 |
| 11 | 03:00 | 38,7 | 51,8 |
| 12 | 03:15 | 37,8 | 53,3 |
| 13 | 03:30 | 38,1 | 52,2 |
| 14 | 03:45 | 37,4 | 52,9 |
| 15 | 04:00 | 37,6 | 54,2 |
| 16 | 04:15 | 38,1 | 53,3 |
| 17 | 04:30 | 37,2 | 50,5 |
| 18 | 04:45 | 39,1 | 55,0 |
| 19 | 05:00 | 39,8 | 54,3 |
| 20 | 05:15 | 39,3 | 53,7 |
| 21 | 05:30 | 39,5 | 56,0 |
| 22 | 05:45 | 40,1 | 52,9 |
| 23 | 06:00 | 37,4 | 52,2 |
| 24 | 06:15 | 37,7 | 50,3 |
| 25 | 06:30 | 38,0 | 51,1 |
| 26 | 06:45 | 37,7 | 50,4 |
| 27 | 07:00 | 42,1 | 54,1 |
| 28 | 07:15 | 43,4 | 55,7 |
| 29 | 07:30 | 43,2 | 54,3 |
| 30 | 07:45 | 44,1 | 55,1 |
| 31 | 08:00 | 43,5 | 56,7 |
| 32 | 08:15 | 43,6 | 54,6 |
| 33 | 08:30 | 44,0 | 56,6 |
| 34 | 08:45 | 48,3 | 55,4 |
| 35 | 09:00 | 48,8 | 56,1 |
| 36 | 09:15 | 49,2 | 54,7 |
| 37 | 09:30 | 49,2 | 56,5 |
| 38 | 09:45 | 49,3 | 55,9 |
| 39 | 10:00 | 46,9 | 55,2 |
| 40 | 10:15 | 47,7 | 57,0 |
| 41 | 10:30 | 46,9 | 56,3 |
| 42 | 10:45 | 47,7 | 57,8 |
| 43 | 11:00 | 47,6 | 56,5 |
| 44 | 11:15 | 46,9 | 54,6 |
| 45 | 11:30 | 47,9 | 55,9 |
| 46 | 11:45 | 49,0 | 57,0 |
| 47 | 12:00 | 46,5 | 54,1 |
| 48 | 12:15 | 45,5 | 57,1 |
| 49 | 12:30 | 46,6 | 55,0 |
| 50 | 12:45 | 49,2 | 56,3 |
| 51 | 13:00 | 50,3 | 55,4 |
| 52 | 13:15 | 51,5 | 58,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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F.5.10.01/rev04

| | | | |
|---|---|---|---|
| 53 | 13:30 | 51,5 | 59,8 |
| 54 | 13:45 | 51,2 | 57,6 |
| 55 | 14:00 | 50,5 | 60,4 |
| 56 | 14:15 | 50,9 | 58,4 |
| 57 | 14:30 | 51,1 | 59,8 |
| 58 | 14:45 | 50,5 | 60,1 |
| 59 | 15:00 | 52,6 | 58,2 |
| 60 | 15:15 | 51,8 | 60,0 |
| 61 | 15:30 | 52,6 | 59,6 |
| 62 | 15:45 | 51,1 | 59,4 |
| 63 | 16:00 | 52,4 | 59,1 |
| 64 | 16:15 | 50,8 | 59,8 |
| 65 | 16:30 | 49,5 | 58,3 |
| 66 | 16:45 | 50,2 | 58,0 |
| 67 | 17:00 | 50,3 | 59,8 |
| 68 | 17:15 | 50,9 | 59,0 |
| 69 | 17:30 | 51,8 | 61,4 |
| 70 | 17:45 | 50,9 | 60,0 |
| 71 | 18:00 | 50,5 | 61,3 |
| 72 | 18:15 | 45,8 | 61,7 |
| 73 | 18:30 | 44,6 | 62,1 |
| 74 | 18:45 | 41,5 | 58,4 |
| 75 | 19:00 | 42,7 | 59,3 |
| 76 | 19:15 | 38,8 | 55,9 |
| 77 | 19:30 | 39,1 | 55,9 |
| 78 | 19:45 | 41,2 | 59,3 |
| 79 | 20:00 | 40,7 | 59,8 |
| 80 | 20:15 | 40,1 | 57,9 |
| 81 | 20:30 | 40,0 | 58,8 |
| 82 | 20:45 | 40,4 | 59,8 |
| 83 | 21:00 | 39,9 | 58,2 |
| 84 | 21:15 | 39,3 | 55,3 |
| 85 | 21:30 | 38,4 | 56,0 |
| 86 | 21:45 | 40,4 | 55,8 |
| 87 | 22:00 | 39,6 | 54,7 |
| 88 | 22:15 | 40,7 | 58,2 |
| 89 | 22:30 | 41,4 | 58,8 |
| 90 | 22:45 | 39,9 | 54,7 |
| 91 | 23:00 | 42,6 | 53,0 |
| 92 | 23:15 | 45,8 | 58,3 |
| 93 | 23:30 | 43,4 | 57,2 |
| 94 | 23:45 | 42,4 | 56,3 |
| 95 | 00:00 | 42,1 | 58,6 |
| 96 | 00:15 | 40,9 | 57,9 |

**2.GÜN**
**30.09.2022-01.10.2022**
**62.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,6 | 57,6 |
| 2 | 00:45 | 38,6 | 57,1 |
| 3 | 01:00 | 42,3 | 60,5 |
| 4 | 01:15 | 41,0 | 58,7 |
| 5 | 01:30 | 47,7 | 62,7 |
| 6 | 01:45 | 44,9 | 63,5 |
| 7 | 02:00 | 43,0 | 58,2 |
| 8 | 02:15 | 48,0 | 66,2 |
| 9 | 02:30 | 45,3 | 59,7 |
| 10 | 02:45 | 44,8 | 57,9 |
| 11 | 03:00 | 45,9 | 59,1 |
| 12 | 03:15 | 47,7 | 61,6 |
| 13 | 03:30 | 46,8 | 62,8 |
| 14 | 03:45 | 46,4 | 63,0 |
| 15 | 04:00 | 44,7 | 60,3 |
| 16 | 04:15 | 43,4 | 62,0 |
| 17 | 04:30 | 45,3 | 60,5 |
| 18 | 04:45 | 41,6 | 58,1 |
| 19 | 05:00 | 43,0 | 63,8 |
| 20 | 05:15 | 41,7 | 59,7 |
| 21 | 05:30 | 42,0 | 57,9 |
| 22 | 05:45 | 40,7 | 57,8 |
| 23 | 06:00 | 41,5 | 57,8 |
| 24 | 06:15 | 39,4 | 53,8 |
| 25 | 06:30 | 40,7 | 54,8 |
| 26 | 06:45 | 42,2 | 57,9 |
| 27 | 07:00 | 45,3 | 60,0 |
| 28 | 07:15 | 45,2 | 62,1 |
| 29 | 07:30 | 46,6 | 59,1 |
| 30 | 07:45 | 50,8 | 65,3 |
| 31 | 08:00 | 51,2 | 68,1 |
| 32 | 08:15 | 51,7 | 70,3 |
| 33 | 08:30 | 50,9 | 68,2 |
| 34 | 08:45 | 50,0 | 67,9 |
| 35 | 09:00 | 51,4 | 70,7 |
| 36 | 09:15 | 52,3 | 69,7 |
| 37 | 09:30 | 53,7 | 67,5 |
| 38 | 09:45 | 51,8 | 64,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 39 | 10:00 | 50,5 | 59,6 |
| 40 | 10:15 | 50,3 | 66,9 |
| 41 | 10:30 | 51,4 | 68,7 |
| 42 | 10:45 | 52,5 | 66,4 |
| 43 | 11:00 | 53,9 | 65,7 |
| 44 | 11:15 | 53,7 | 64,1 |
| 45 | 11:30 | 52,8 | 70,3 |
| 46 | 11:45 | 53,8 | 65,8 |
| 47 | 12:00 | 50,3 | 64,2 |
| 48 | 12:15 | 53,4 | 61,8 |
| 49 | 12:30 | 53,6 | 64,9 |
| 50 | 12:45 | 54,5 | 62,2 |
| 51 | 13:00 | 53,6 | 67,4 |
| 52 | 13:15 | 52,9 | 65,8 |
| 53 | 13:30 | 50,7 | 63,4 |
| 54 | 13:45 | 52,8 | 61,7 |
| 55 | 14:00 | 53,0 | 63,5 |
| 56 | 14:15 | 51,5 | 62,7 |
| 57 | 14:30 | 51,1 | 67,9 |
| 58 | 14:45 | 52,3 | 64,8 |
| 59 | 15:00 | 51,4 | 68,6 |
| 60 | 15:15 | 52,9 | 65,2 |
| 61 | 15:30 | 51,7 | 63,3 |
| 62 | 15:45 | 51,9 | 61,5 |
| 63 | 16:00 | 52,6 | 63,8 |
| 64 | 16:15 | 51,5 | 64,8 |
| 65 | 16:30 | 52,0 | 63,2 |
| 66 | 16:45 | 50,9 | 64,3 |
| 67 | 17:00 | 50,1 | 64,7 |
| 68 | 17:15 | 54,1 | 66,5 |
| 69 | 17:30 | 53,9 | 69,0 |
| 70 | 17:45 | 53,6 | 67,9 |
| 71 | 18:00 | 51,9 | 68,7 |
| 72 | 18:15 | 54,1 | 70,7 |
| 73 | 18:30 | 52,2 | 69,0 |
| 74 | 18:45 | 52,4 | 68,2 |
| 75 | 19:00 | 53,1 | 73,4 |
| 76 | 19:15 | 52,3 | 68,6 |
| 77 | 19:30 | 52,0 | 71,7 |
| 78 | 19:45 | 51,2 | 69,9 |
| 79 | 20:00 | 48,3 | 70,3 |
| 80 | 20:15 | 49,6 | 69,6 |
| 81 | 20:30 | 45,8 | 64,0 |
| 82 | 20:45 | 46,4 | 65,5 |
| 83 | 21:00 | 47,6 | 67,7 |
| 84 | 21:15 | 46,1 | 67,7 |
| 85 | 21:30 | 45,3 | 64,6 |
| 86 | 21:45 | 43,2 | 64,8 |
| 87 | 22:00 | 42,1 | 64,1 |
| 88 | 22:15 | 45,2 | 63,6 |
| 89 | 22:30 | 44,1 | 58,8 |
| 90 | 22:45 | 47,5 | 60,1 |
| 91 | 23:00 | 42,9 | 57,7 |
| 92 | 23:15 | 41,2 | 59,7 |
| 93 | 23:30 | 39,7 | 57,0 |
| 94 | 23:45 | 39,3 | 55,6 |
| 95 | 00:00 | 38,4 | 55,8 |
| 96 | 00:15 | 40,3 | 59,9 |

**2.GÜN**
**30.09.2022-01.10.2022**
**63.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 38,4 | 50,1 |
| 2 | 00:45 | 38,5 | 49,9 |
| 3 | 01:00 | 39,1 | 49,7 |
| 4 | 01:15 | 40,6 | 54,6 |
| 5 | 01:30 | 40,3 | 53,3 |
| 6 | 01:45 | 40,4 | 54,2 |
| 7 | 02:00 | 40,8 | 55,6 |
| 8 | 02:15 | 40,7 | 53,6 |
| 9 | 02:30 | 37,8 | 52,6 |
| 10 | 02:45 | 38,1 | 51,8 |
| 11 | 03:00 | 38,5 | 51,6 |
| 12 | 03:15 | 37,7 | 53,0 |
| 13 | 03:30 | 38,0 | 52,0 |
| 14 | 03:45 | 37,2 | 52,6 |
| 15 | 04:00 | 37,3 | 53,9 |
| 16 | 04:15 | 38,0 | 53,0 |
| 17 | 04:30 | 37,1 | 50,1 |
| 18 | 04:45 | 38,8 | 54,7 |
| 19 | 05:00 | 39,5 | 54,0 |
| 20 | 05:15 | 39,1 | 53,3 |
| 21 | 05:30 | 39,3 | 55,6 |
| 22 | 05:45 | 39,9 | 52,6 |
| 23 | 06:00 | 37,2 | 52,0 |
| 24 | 06:15 | 37,4 | 49,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 25 | 06:30 | 37,9 | 50,7 |
| 26 | 06:45 | 37,4 | 50,0 |
| 27 | 07:00 | 41,9 | 53,8 |
| 28 | 07:15 | 43,2 | 55,3 |
| 29 | 07:30 | 43,0 | 54,0 |
| 30 | 07:45 | 43,8 | 54,8 |
| 31 | 08:00 | 43,3 | 56,4 |
| 32 | 08:15 | 43,4 | 54,3 |
| 33 | 08:30 | 43,7 | 56,3 |
| 34 | 08:45 | 48,0 | 55,1 |
| 35 | 09:00 | 48,5 | 55,7 |
| 36 | 09:15 | 48,8 | 54,4 |
| 37 | 09:30 | 49,0 | 56,2 |
| 38 | 09:45 | 49,1 | 55,5 |
| 39 | 10:00 | 46,7 | 54,9 |
| 40 | 10:15 | 47,5 | 56,7 |
| 41 | 10:30 | 46,7 | 55,9 |
| 42 | 10:45 | 47,5 | 57,5 |
| 43 | 11:00 | 47,4 | 56,2 |
| 44 | 11:15 | 46,7 | 54,3 |
| 45 | 11:30 | 47,7 | 55,5 |
| 46 | 11:45 | 48,7 | 56,7 |
| 47 | 12:00 | 46,3 | 53,8 |
| 48 | 12:15 | 45,3 | 56,8 |
| 49 | 12:30 | 46,4 | 54,7 |
| 50 | 12:45 | 49,0 | 55,9 |
| 51 | 13:00 | 50,0 | 55,1 |
| 52 | 13:15 | 51,2 | 58,5 |
| 53 | 13:30 | 51,2 | 59,5 |
| 54 | 13:45 | 50,9 | 57,3 |
| 55 | 14:00 | 50,2 | 60,0 |
| 56 | 14:15 | 50,6 | 58,1 |
| 57 | 14:30 | 50,8 | 59,5 |
| 58 | 14:45 | 50,2 | 59,8 |
| 59 | 15:00 | 52,3 | 57,9 |
| 60 | 15:15 | 51,5 | 59,7 |
| 61 | 15:30 | 52,3 | 59,3 |
| 62 | 15:45 | 50,8 | 59,1 |
| 63 | 16:00 | 52,1 | 58,8 |
| 64 | 16:15 | 50,5 | 59,5 |
| 65 | 16:30 | 49,2 | 58,0 |
| 66 | 16:45 | 49,9 | 57,7 |
| 67 | 17:00 | 50,0 | 59,5 |
| 68 | 17:15 | 50,6 | 58,7 |
| 69 | 17:30 | 51,5 | 60,9 |
| 70 | 17:45 | 50,6 | 59,7 |
| 71 | 18:00 | 50,2 | 60,8 |
| 72 | 18:15 | 45,6 | 61,4 |
| 73 | 18:30 | 44,2 | 61,8 |
| 74 | 18:45 | 41,4 | 58,1 |
| 75 | 19:00 | 42,6 | 59,0 |
| 76 | 19:15 | 38,6 | 55,5 |
| 77 | 19:30 | 38,8 | 55,5 |
| 78 | 19:45 | 41,0 | 59,0 |
| 79 | 20:00 | 40,4 | 59,5 |
| 80 | 20:15 | 39,9 | 57,6 |
| 81 | 20:30 | 39,7 | 58,5 |
| 82 | 20:45 | 40,2 | 59,5 |
| 83 | 21:00 | 39,6 | 57,9 |
| 84 | 21:15 | 39,1 | 55,0 |
| 85 | 21:30 | 38,1 | 55,6 |
| 86 | 21:45 | 40,2 | 55,4 |
| 87 | 22:00 | 39,4 | 54,5 |
| 88 | 22:15 | 40,4 | 57,9 |
| 89 | 22:30 | 41,1 | 58,5 |
| 90 | 22:45 | 39,6 | 54,5 |
| 91 | 23:00 | 42,5 | 52,7 |
| 92 | 23:15 | 45,6 | 58,0 |
| 93 | 23:30 | 43,2 | 56,9 |
| 94 | 23:45 | 42,3 | 55,9 |
| 95 | 00:00 | 41,9 | 58,3 |
| 96 | 00:15 | 40,7 | 57,6 |

**2.GÜN**
**30.09.2022-01.10.2022**
**64.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,2 | 65,0 |
| 2 | 00:45 | 43,4 | 60,8 |
| 3 | 01:00 | 44,0 | 58,6 |
| 4 | 01:15 | 45,5 | 63,7 |
| 5 | 01:30 | 45,3 | 59,1 |
| 6 | 01:45 | 44,9 | 57,6 |
| 7 | 02:00 | 42,3 | 52,2 |
| 8 | 02:15 | 43,8 | 62,2 |
| 9 | 02:30 | 40,8 | 54,6 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 10 | 02:45 | 42,3 | 57,2 | 54 | 13:45 | 55,2 | 63,3 |
| 11 | 03:00 | 42,4 | 51,8 | 55 | 14:00 | 54,3 | 66,3 |
| 12 | 03:15 | 42,1 | 54,1 | 56 | 14:15 | 54,7 | 64,0 |
| 13 | 03:30 | 43,4 | 58,6 | 57 | 14:30 | 54,9 | 65,6 |
| 14 | 03:45 | 43,1 | 60,7 | 58 | 14:45 | 54,3 | 65,9 |
| 15 | 04:00 | 43,3 | 56,7 | 59 | 15:00 | 53,6 | 63,9 |
| 16 | 04:15 | 43,4 | 58,5 | 60 | 15:15 | 52,7 | 65,8 |
| 17 | 04:30 | 42,9 | 60,2 | 61 | 15:30 | 53,6 | 65,3 |
| 18 | 04:45 | 43,5 | 57,2 | 62 | 15:45 | 54,9 | 65,2 |
| 19 | 05:00 | 45,2 | 55,2 | 63 | 16:00 | 53,4 | 64,9 |
| 20 | 05:15 | 42,9 | 52,6 | 64 | 16:15 | 54,5 | 65,6 |
| 21 | 05:30 | 44,3 | 52,7 | 65 | 16:30 | 53,1 | 63,9 |
| 22 | 05:45 | 42,5 | 52,3 | 66 | 16:45 | 53,9 | 63,8 |
| 23 | 06:00 | 38,4 | 50,2 | 67 | 17:00 | 54,0 | 65,6 |
| 24 | 06:15 | 39,6 | 54,0 | 68 | 17:15 | 54,7 | 64,7 |
| 25 | 06:30 | 40,0 | 54,8 | 69 | 17:30 | 54,5 | 66,1 |
| 26 | 06:45 | 39,6 | 54,1 | 70 | 17:45 | 53,5 | 64,5 |
| 27 | 07:00 | 44,3 | 58,2 | 71 | 18:00 | 53,2 | 65,9 |
| 28 | 07:15 | 45,6 | 59,8 | 72 | 18:15 | 48,3 | 66,4 |
| 29 | 07:30 | 45,3 | 58,4 | 73 | 18:30 | 46,9 | 66,8 |
| 30 | 07:45 | 46,5 | 59,2 | 74 | 18:45 | 43,6 | 62,7 |
| 31 | 08:00 | 45,7 | 60,9 | 75 | 19:00 | 45,1 | 63,7 |
| 32 | 08:15 | 50,8 | 65,0 | 76 | 19:15 | 40,9 | 60,1 |
| 33 | 08:30 | 51,2 | 67,3 | 77 | 19:30 | 41,0 | 60,1 |
| 34 | 08:45 | 53,2 | 65,9 | 78 | 19:45 | 43,4 | 63,7 |
| 35 | 09:00 | 53,7 | 66,7 | 79 | 20:00 | 46,9 | 56,5 |
| 36 | 09:15 | 54,1 | 65,1 | 80 | 20:15 | 44,2 | 58,0 |
| 37 | 09:30 | 54,1 | 67,1 | 81 | 20:30 | 43,8 | 59,5 |
| 38 | 09:45 | 54,3 | 66,4 | 82 | 20:45 | 44,5 | 58,0 |
| 39 | 10:00 | 54,7 | 65,7 | 83 | 21:00 | 45,7 | 52,2 |
| 40 | 10:15 | 52,6 | 67,7 | 84 | 21:15 | 44,8 | 52,6 |
| 41 | 10:30 | 54,7 | 66,9 | 85 | 21:30 | 43,0 | 54,5 |
| 42 | 10:45 | 52,6 | 68,8 | 86 | 21:45 | 44,0 | 54,2 |
| 43 | 11:00 | 55,5 | 67,1 | 87 | 22:00 | 43,2 | 52,7 |
| 44 | 11:15 | 54,7 | 65,0 | 88 | 22:15 | 44,8 | 54,8 |
| 45 | 11:30 | 52,8 | 66,4 | 89 | 22:30 | 44,6 | 56,7 |
| 46 | 11:45 | 54,0 | 67,7 | 90 | 22:45 | 41,8 | 57,6 |
| 47 | 12:00 | 54,1 | 64,4 | 91 | 23:00 | 42,4 | 55,3 |
| 48 | 12:15 | 52,8 | 68,0 | 92 | 23:15 | 44,0 | 55,6 |
| 49 | 12:30 | 54,3 | 65,5 | 93 | 23:30 | 38,9 | 54,9 |
| 50 | 12:45 | 54,1 | 66,9 | 94 | 23:45 | 40,5 | 52,1 |
| 51 | 13:00 | 54,4 | 65,9 | 95 | 00:00 | 42,2 | 55,4 |
| 52 | 13:15 | 59,8 | 70,0 | 96 | 00:15 | 42,9 | 55,5 |
| 53 | 13:30 | 55,4 | 65,6 | | | | |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**2.GÜN**
**30.09.2022-01.10.2022**
**65.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 44,5 | 56,4 |
| 2 | 00:45 | 44,9 | 61,1 |
| 3 | 01:00 | 45,5 | 63,3 |
| 4 | 01:15 | 47,8 | 66,5 |
| 5 | 01:30 | 50,9 | 62,3 |
| 6 | 01:45 | 50,4 | 68,8 |
| 7 | 02:00 | 47,3 | 64,4 |
| 8 | 02:15 | 49,2 | 67,5 |
| 9 | 02:30 | 47,1 | 67,3 |
| 10 | 02:45 | 47,4 | 70,4 |
| 11 | 03:00 | 47,6 | 63,7 |
| 12 | 03:15 | 47,3 | 66,7 |
| 13 | 03:30 | 48,8 | 72,2 |
| 14 | 03:45 | 48,4 | 70,5 |
| 15 | 04:00 | 48,6 | 67,5 |
| 16 | 04:15 | 48,8 | 66,6 |
| 17 | 04:30 | 48,3 | 65,5 |
| 18 | 04:45 | 46,1 | 65,8 |
| 19 | 05:00 | 47,9 | 67,9 |
| 20 | 05:15 | 45,6 | 60,9 |
| 21 | 05:30 | 47,1 | 61,5 |
| 22 | 05:45 | 44,9 | 64,7 |
| 23 | 06:00 | 40,5 | 55,7 |
| 24 | 06:15 | 42,2 | 60,9 |
| 25 | 06:30 | 44,3 | 62,2 |
| 26 | 06:45 | 43,7 | 58,6 |
| 27 | 07:00 | 45,9 | 64,5 |
| 28 | 07:15 | 41,6 | 55,4 |
| 29 | 07:30 | 45,1 | 57,5 |
| 30 | 07:45 | 47,8 | 57,9 |
| 31 | 08:00 | 48,7 | 54,4 |
| 32 | 08:15 | 50,2 | 56,7 |
| 33 | 08:30 | 50,1 | 54,3 |
| 34 | 08:45 | 51,6 | 56,8 |
| 35 | 09:00 | 52,0 | 58,2 |
| 36 | 09:15 | 52,1 | 60,2 |
| 37 | 09:30 | 52,5 | 61,8 |
| 38 | 09:45 | 53,1 | 58,2 |
| 39 | 10:00 | 52,3 | 58,5 |
| 40 | 10:15 | 52,1 | 58,8 |
| 41 | 10:30 | 52,6 | 60,9 |
| 42 | 10:45 | 53,3 | 61,8 |
| 43 | 11:00 | 53,0 | 60,4 |
| 44 | 11:15 | 54,7 | 61,0 |
| 45 | 11:30 | 54,3 | 62,8 |
| 46 | 11:45 | 54,5 | 59,6 |
| 47 | 12:00 | 53,6 | 61,1 |
| 48 | 12:15 | 54,2 | 61,8 |
| 49 | 12:30 | 54,3 | 59,4 |
| 50 | 12:45 | 54,5 | 60,0 |
| 51 | 13:00 | 54,0 | 61,7 |
| 52 | 13:15 | 53,9 | 60,4 |
| 53 | 13:30 | 54,8 | 59,0 |
| 54 | 13:45 | 54,4 | 61,4 |
| 55 | 14:00 | 54,6 | 57,9 |
| 56 | 14:15 | 53,7 | 60,5 |
| 57 | 14:30 | 51,0 | 57,4 |
| 58 | 14:45 | 52,5 | 59,0 |
| 59 | 15:00 | 53,1 | 61,0 |
| 60 | 15:15 | 53,0 | 60,4 |
| 61 | 15:30 | 53,2 | 57,7 |
| 62 | 15:45 | 52,7 | 55,9 |
| 63 | 16:00 | 53,4 | 60,4 |
| 64 | 16:15 | 53,0 | 58,0 |
| 65 | 16:30 | 51,4 | 57,9 |
| 66 | 16:45 | 52,1 | 56,8 |
| 67 | 17:00 | 52,7 | 57,9 |
| 68 | 17:15 | 52,3 | 59,5 |
| 69 | 17:30 | 52,5 | 61,1 |
| 70 | 17:45 | 52,7 | 60,9 |
| 71 | 18:00 | 53,2 | 62,0 |
| 72 | 18:15 | 52,9 | 61,5 |
| 73 | 18:30 | 53,3 | 64,2 |
| 74 | 18:45 | 54,5 | 65,0 |
| 75 | 19:00 | 54,0 | 62,7 |
| 76 | 19:15 | 49,9 | 61,1 |
| 77 | 19:30 | 52,1 | 62,3 |
| 78 | 19:45 | 54,0 | 66,4 |
| 79 | 20:00 | 54,3 | 60,9 |
| 80 | 20:15 | 47,9 | 58,8 |
| 81 | 20:30 | 46,6 | 59,6 |
| 82 | 20:45 | 45,7 | 65,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 83 | 21:00 | 44,9 | 58,6 |
| 84 | 21:15 | 44,5 | 58,9 |
| 85 | 21:30 | 44,9 | 61,1 |
| 86 | 21:45 | 44,2 | 60,7 |
| 87 | 22:00 | 44,3 | 59,0 |
| 88 | 22:15 | 45,8 | 61,4 |
| 89 | 22:30 | 45,9 | 63,6 |
| 90 | 22:45 | 42,8 | 64,3 |
| 91 | 23:00 | 43,8 | 61,9 |
| 92 | 23:15 | 45,2 | 62,4 |
| 93 | 23:30 | 40,0 | 61,4 |
| 94 | 23:45 | 39,1 | 58,5 |
| 95 | 00:00 | 40,4 | 62,0 |
| 96 | 00:15 | 41,4 | 60,1 |

**2.GÜN**
**30.09.2022-01.10.2022**
**66.NOKTA**
**Gürültü Ölçüm Sonuçları**
(24 saatlik Değerler)

| Data number | Start Time | Leq | Lmax |
|---|---|---|---|
| 1 | 00:30 | 42,0 | 50,2 |
| 2 | 00:45 | 43,8 | 51,5 |
| 3 | 01:00 | 43,5 | 52,0 |
| 4 | 01:15 | 44,1 | 50,5 |
| 5 | 01:30 | 44,1 | 52,2 |
| 6 | 01:45 | 44,3 | 54,0 |
| 7 | 02:00 | 41,9 | 49,4 |
| 8 | 02:15 | 45,7 | 55,2 |
| 9 | 02:30 | 42,8 | 50,5 |
| 10 | 02:45 | 43,2 | 49,8 |
| 11 | 03:00 | 43,1 | 52,3 |
| 12 | 03:15 | 45,9 | 53,0 |
| 13 | 03:30 | 44,1 | 55,3 |
| 14 | 03:45 | 42,5 | 51,6 |
| 15 | 04:00 | 43,8 | 53,4 |
| 16 | 04:15 | 41,9 | 51,7 |
| 17 | 04:30 | 45,9 | 54,3 |
| 18 | 04:45 | 42,4 | 52,5 |
| 19 | 05:00 | 45,0 | 55,6 |
| 20 | 05:15 | 41,2 | 49,6 |
| 21 | 05:30 | 42,5 | 53,3 |
| 22 | 05:45 | 41,5 | 50,2 |
| 23 | 06:00 | 39,6 | 49,5 |
| 24 | 06:15 | 40,9 | 50,1 |
| 25 | 06:30 | 44,2 | 53,4 |
| 26 | 06:45 | 43,3 | 53,3 |
| 27 | 07:00 | 43,9 | 53,5 |
| 28 | 07:15 | 45,8 | 55,3 |
| 29 | 07:30 | 44,9 | 56,3 |
| 30 | 07:45 | 44,4 | 56,9 |
| 31 | 08:00 | 47,7 | 58,2 |
| 32 | 08:15 | 48,8 | 60,6 |
| 33 | 08:30 | 47,2 | 60,7 |
| 34 | 08:45 | 47,8 | 62,2 |
| 35 | 09:00 | 49,8 | 61,2 |
| 36 | 09:15 | 53,2 | 62,8 |
| 37 | 09:30 | 50,0 | 62,1 |
| 38 | 09:45 | 49,0 | 57,6 |
| 39 | 10:00 | 48,8 | 58,2 |
| 40 | 10:15 | 49,7 | 60,6 |
| 41 | 10:30 | 51,9 | 60,9 |
| 42 | 10:45 | 47,3 | 55,9 |
| 43 | 11:00 | 47,5 | 58,8 |
| 44 | 11:15 | 50,3 | 60,2 |
| 45 | 11:30 | 48,1 | 61,3 |
| 46 | 11:45 | 49,8 | 61,5 |
| 47 | 12:00 | 45,7 | 56,7 |
| 48 | 12:15 | 47,9 | 57,9 |
| 49 | 12:30 | 49,4 | 57,3 |
| 50 | 12:45 | 47,3 | 55,2 |
| 51 | 13:00 | 48,6 | 57,7 |
| 52 | 13:15 | 51,1 | 58,4 |
| 53 | 13:30 | 49,0 | 58,7 |
| 54 | 13:45 | 50,4 | 57,7 |
| 55 | 14:00 | 48,0 | 58,0 |
| 56 | 14:15 | 51,2 | 59,8 |
| 57 | 14:30 | 50,1 | 59,9 |
| 58 | 14:45 | 46,6 | 55,0 |
| 59 | 15:00 | 49,8 | 60,5 |
| 60 | 15:15 | 51,5 | 58,8 |
| 61 | 15:30 | 51,2 | 58,7 |
| 62 | 15:45 | 47,6 | 54,2 |
| 63 | 16:00 | 48,2 | 55,9 |
| 64 | 16:15 | 52,5 | 56,9 |
| 65 | 16:30 | 48,7 | 55,2 |
| 66 | 16:45 | 45,0 | 54,6 |
| 67 | 17:00 | 46,0 | 57,0 |
| 68 | 17:15 | 45,9 | 55,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| | | | |
|---|---|---|---|
| 69 | 17:30 | 50,0 | 59,0 |
| 70 | 17:45 | 50,6 | 59,7 |
| 71 | 18:00 | 49,5 | 61,1 |
| 72 | 18:15 | 50,8 | 62,1 |
| 73 | 18:30 | 46,8 | 59,0 |
| 74 | 18:45 | 48,7 | 58,7 |
| 75 | 19:00 | 47,2 | 60,6 |
| 76 | 19:15 | 46,0 | 57,6 |
| 77 | 19:30 | 50,2 | 58,4 |
| 78 | 19:45 | 51,1 | 60,0 |
| 79 | 20:00 | 46,6 | 56,5 |
| 80 | 20:15 | 45,6 | 57,0 |
| 81 | 20:30 | 44,5 | 57,1 |
| 82 | 20:45 | 43,4 | 51,6 |
| 83 | 21:00 | 43,9 | 53,1 |
| 84 | 21:15 | 42,5 | 51,7 |
| 85 | 21:30 | 46,5 | 55,0 |
| 86 | 21:45 | 45,1 | 55,2 |
| 87 | 22:00 | 42,9 | 52,4 |
| 88 | 22:15 | 44,0 | 53,4 |
| 89 | 22:30 | 42,8 | 52,1 |
| 90 | 22:45 | 45,8 | 55,0 |
| 91 | 23:00 | 43,5 | 51,8 |
| 92 | 23:15 | 42,6 | 52,0 |
| 93 | 23:30 | 40,3 | 52,0 |
| 94 | 23:45 | 37,0 | 48,7 |
| 95 | 00:00 | 38,0 | 49,8 |
| 96 | 00:15 | 40,2 | 49,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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## IFC INTERNATIONAL FINANCE CORPORATION KURUMU ÇERÇEVESİNDE DEĞERLENDİRME

IFC Kriterleri açısından gürültü değerlendirmesi aşağıda verilen sınır değerler dikkate alınarak değerlendirilir.

**Table 1.7.1- Noise Level Guidelines[54]**

| Receptor | One Hour $L_{Aeq}$ (dBA) | |
|---|---|---|
| | Daytime 07:00 - 22:00 | Nighttime 22:00 - 07:00 |
| Residential; institutional; educational[55] | 55 | 45 |
| Industrial; commercial | 70 | 70 |

**Tablo 1.7.1 çerçevesinde değerlendirme (1.GÜN);**

| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 1.NOKTA | 506305 | 4525655 | 48,7 | 44,0 |
| 2.NOKTA | 507031 | 4525866 | 47,5 | 40,6 |
| 3.NOKTA | 512427 | 4524843 | 50,9 | 42,9 |
| 4.NOKTA | 508330 | 4528503 | 49,3 | 41,3 |
| 5.NOKTA | 511338 | 4529049 | 50,5 | 43,4 |
| 6.NOKTA | 512467 | 4527409 | 47,5 | 39,4 |
| 7.NOKTA | 514646 | 4529426 | 52,4 | 42,0 |
| 8.NOKTA | 517259 | 4531150 | 46,0 | 36,2 |
| 9.NOKTA | 518051 | 4529260 | 47,4 | 39,2 |
| 10.NOKTA | 520917 | 4531575 | 51,1 | 44,5 |
| 11.NOKTA | 523263 | 4530892 | 48,5 | 43,9 |
| 12.NOKTA | 523420 | 4532270 | 51,4 | 40,6 |
| 13.NOKTA | 525119 | 4531796 | 49,4 | 41,5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 14.NOKTA | 526797 | 4533237 | 47,8 | 40,2 |
| 15.NOKTA | 527788 | 4532359 | 49,1 | 41,2 |
| 16.NOKTA | 529595 | 4535479 | 48,2 | 39,0 |
| 17.NOKTA | 526415 | 4540060 | 53,3 | 41,9 |
| 18.NOKTA | 529124 | 4539988 | 49,3 | 41,7 |
| 19.NOKTA | 531283 | 4536793 | 53,2 | 45,7 |
| 20.NOKTA | 532721 | 4533447 | 48,1 | 46,5 |
| 21.NOKTA | 531835 | 4540360 | 51,0 | 43,7 |
| 22.NOKTA | 536037 | 4539511 | 48,4 | 40,6 |
| 23.NOKTA | 536542 | 4538859 | 49,3 | 43,5 |
| 24.NOKTA | 537822 | 4539890 | 49,3 | 43,6 |
| 25.NOKTA | 539409 | 4540872 | 46,8 | 39,6 |
| 26.NOKTA | 540433 | 4541503 | 48,1 | 41,2 |
| 27.NOKTA | 540972 | 4541731 | 49,8 | 42,0 |
| 28.NOKTA | 543153 | 4541309 | 47,8 | 39,8 |
| 29.NOKTA | 544195 | 4540054 | 48,4 | 39,6 |
| 30.NOKTA | 544143 | 4541845 | 48,5 | 41,1 |
| 31.NOKTA | 545250 | 4541470 | 48,9 | 40,9 |
| 32.NOKTA | 546710 | 4539397 | 49,8 | 41,1 |
| 33.NOKTA | 548594 | 4539813 | 48,2 | 39,4 |
| 34.NOKTA | 548702 | 4539430 | 50,2 | 43,1 |
| 35.NOKTA | 549590 | 4541426 | 48,9 | 40,9 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 36.NOKTA | 550732 | 4538585 | 44,9 | 39,6 |
| 37.NOKTA | 552634 | 4538395 | 49,0 | 40,3 |
| 38.NOKTA | 553205 | 4542665 | 49,0 | 40,9 |
| 39.NOKTA | 552392 | 4544143 | 48,2 | 38,5 |
| 40.NOKTA | 555979 | 4543687 | 48,7 | 40,6 |
| 41.NOKTA | 560252 | 4541819 | 49,5 | 40,8 |
| 42.NOKTA | 562553 | 4548347 | 48,8 | 40,8 |
| 43.NOKTA | 568345 | 4548605 | 48,7 | 40,3 |
| 44.NOKTA | 569552 | 4546811 | 48,8 | 40,7 |
| 45.NOKTA | 570179 | 4544494 | 50,2 | 40,8 |
| 46.NOKTA | 571562 | 4544339 | 47,2 | 41,1 |
| 47.NOKTA | 574486 | 4548016 | 47,3 | 39,2 |
| 48.NOKTA | 575241 | 4549476 | 51,7 | 41,9 |
| 49.NOKTA | 578864 | 4549330 | 52,0 | 40,2 |
| 50.NOKTA | 576549 | 4551913 | 49,4 | 43,6 |
| 51.NOKTA | 576082 | 4547948 | 48,0 | 40,6 |
| 52.NOKTA | 580171 | 4547562 | 48,3 | 40,8 |
| 53.NOKTA | 580496 | 4543967 | 46,4 | 40,4 |
| 54.NOKTA | 580799 | 4538260 | 48,5 | 40,2 |
| 55.NOKTA | 584542 | 4543854 | 47,5 | 38,4 |
| 56.NOKTA | 585300 | 4548362 | 50,2 | 42,6 |
| 57.NOKTA | 588163 | 4548683 | 47,8 | 39,7 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 58.NOKTA | 586483 | 4550069 | 47,7 | 42,1 |
| 59.NOKTA | 588893 | 4551242 | 49,8 | 39,8 |
| 60.NOKTA | 588815 | 4554539 | 45,8 | 38,1 |
| 61.NOKTA | 590046 | 4559119 | 51,0 | 44,0 |
| 62.NOKTA | 591887 | 4549969 | 50,1 | 41,8 |
| 63.NOKTA | 594478 | 4549785 | 48,1 | 41,0 |
| 64.NOKTA | 596088 | 4549563 | 53,3 | 44,0 |
| 65.NOKTA | 595540 | 4551889 | 51,7 | 43,1 |
| 66.NOKTA | 599082 | 4551542 | 48,1 | 40,4 |

Ölçüm sonuçlarının; tüm ölçüm noktalarında uygun olduğu görülmektedir.

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**Tablo 1.7.1 çerçevesinde değerlendirme (2.GÜN);**

| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 1.NOKTA | 506305 | 4525655 | 47,1 | 39,7 |
| 2.NOKTA | 507031 | 4525866 | 47,6 | 40,2 |
| 3.NOKTA | 512427 | 4524843 | 50,8 | 43,0 |
| 4.NOKTA | 508330 | 4528503 | 44,9 | 39,5 |
| 5.NOKTA | 511338 | 4529049 | 46,6 | 42,1 |
| 6.NOKTA | 512467 | 4527409 | 47,1 | 40,9 |
| 7.NOKTA | 514646 | 4529426 | 50,3 | 42,7 |
| 8.NOKTA | 517259 | 4531150 | 47,3 | 39,0 |
| 9.NOKTA | 518051 | 4529260 | 47,0 | 39,7 |
| 10.NOKTA | 520917 | 4531575 | 49,8 | 40,7 |
| 11.NOKTA | 523263 | 4530892 | 48,8 | 41,3 |
| 12.NOKTA | 523420 | 4532270 | 49,5 | 42,2 |
| 13.NOKTA | 525119 | 4531796 | 43,6 | 42,4 |
| 14.NOKTA | 526797 | 4533237 | 48,7 | 40,7 |
| 15.NOKTA | 527788 | 4532359 | 49,0 | 39,7 |
| 16.NOKTA | 529595 | 4535479 | 47,3 | 41,5 |
| 17.NOKTA | 526415 | 4540060 | 50,4 | 43,7 |
| 18.NOKTA | 529124 | 4539988 | 48,2 | 42,6 |
| 19.NOKTA | 531283 | 4536793 | 52,5 | 42,7 |
| 20.NOKTA | 532721 | 4533447 | 47,7 | 39,3 |
| 21.NOKTA | 531835 | 4540360 | 49,1 | 41,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 22.NOKTA | 536037 | 4539511 | 46,7 | 40,2 |
| 23.NOKTA | 536542 | 4538859 | 49,6 | 41,6 |
| 24.NOKTA | 537822 | 4539890 | 49,8 | 42,7 |
| 25.NOKTA | 539409 | 4540872 | 46,1 | 42,0 |
| 26.NOKTA | 540433 | 4541503 | 48,2 | 40,6 |
| 27.NOKTA | 540972 | 4541731 | 50,0 | 41,6 |
| 28.NOKTA | 543153 | 4541309 | 48,1 | 40,1 |
| 29.NOKTA | 544195 | 4540054 | 49,9 | 41,2 |
| 30.NOKTA | 544143 | 4541845 | 50,4 | 42,2 |
| 31.NOKTA | 545250 | 4541470 | 49,8 | 41,6 |
| 32.NOKTA | 546710 | 4539397 | 51,2 | 42,4 |
| 33.NOKTA | 548594 | 4539813 | 48,7 | 42,1 |
| 34.NOKTA | 548702 | 4539430 | 49,3 | 41,3 |
| 35.NOKTA | 549590 | 4541426 | 49,9 | 42,3 |
| 36.NOKTA | 550732 | 4538585 | 50,4 | 42,1 |
| 37.NOKTA | 552634 | 4538395 | 47,8 | 39,8 |
| 38.NOKTA | 553205 | 4542665 | 48,9 | 40,7 |
| 39.NOKTA | 552392 | 4544143 | 49,6 | 43,1 |
| 40.NOKTA | 555979 | 4543687 | 49,0 | 42,5 |
| 41.NOKTA | 560252 | 4541819 | 46,9 | 44,5 |
| 42.NOKTA | 562553 | 4548347 | 51,6 | 42,7 |
| 43.NOKTA | 568345 | 4548605 | 50,1 | 42,0 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 44.NOKTA | 569552 | 4546811 | 48,7 | 42,5 |
| 45.NOKTA | 570179 | 4544494 | 47,4 | 42,5 |
| 46.NOKTA | 571562 | 4544339 | 47,0 | 37,1 |
| 47.NOKTA | 574486 | 4548016 | 50,4 | 42,6 |
| 48.NOKTA | 575241 | 4549476 | 48,6 | 42,4 |
| 49.NOKTA | 578864 | 4549330 | 51,7 | 43,9 |
| 50.NOKTA | 576549 | 4551913 | 47,9 | 40,6 |
| 51.NOKTA | 576082 | 4547948 | 50,0 | 42,5 |
| 52.NOKTA | 580171 | 4547562 | 47,0 | 42,1 |
| 53.NOKTA | 580496 | 4543967 | 45,5 | 40,4 |
| 54.NOKTA | 580799 | 4538260 | 50,9 | 42,4 |
| 55.NOKTA | 584542 | 4543854 | 46,7 | 39,1 |
| 56.NOKTA | 585300 | 4548362 | 51,2 | 44,0 |
| 57.NOKTA | 588163 | 4548683 | 47,5 | 41,8 |
| 58.NOKTA | 586483 | 4550069 | 47,7 | 40,6 |
| 59.NOKTA | 588893 | 4551242 | 47,6 | 41,0 |
| 60.NOKTA | 588815 | 4554539 | 47,9 | 41,7 |
| 61.NOKTA | 590046 | 4559119 | 46,6 | 40,4 |
| 62.NOKTA | 591887 | 4549969 | 51,0 | 42,8 |
| 63.NOKTA | 594478 | 4549785 | 46,3 | 40,2 |
| 64.NOKTA | 596088 | 4549563 | 50,8 | 42,7 |
| 65.NOKTA | 595540 | 4551889 | 51,4 | 44,8 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri | Ölçüm Lokasyonu | | Ölçüm Sonucu Gündüz (dBA) | Ölçüm Sonucu Gece (dBA) |
|---|---|---|---|---|
| 66.NOKTA | 599082 | 4551542 | 48,0 | 42,5 |

Ölçüm sonuçlarının; tüm ölçüm noktalarında uygun olduğu görülmektedir.

# 2. Titreşim Ölçüm Sonuç Raporu

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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### iv ÖLÇÜM RAPORLARI

#### 2. Kullanılan Cihazlar

Titreşim ölçümlerinde CESVA VC 431 titreşim ölçüm cihazı ve Cesva T240010 titreşim kalibratörü kullanılmıştır.

### v ÖLÇÜM METOTLARI

Ölçümler aşağıda verilen standartlar çerçevesinde gerçekleştirilmiştir.

| Parametre | Test / Analiz Metodunun Adı | Deney Metodu ve Kabul Tarihi |
|---|---|---|
| Titreşim Ölçümü | Mekanik titreşim ve şok - Binaların titreşimi - Titreşimin ölçülmesi ve binalara etkilerinin değerlendirilmesi için kılavuz | TS ISO 4866 |

### vi ÖLÇÜM SONUÇLARI VE LOKASYONLAR

Belirlenen 48 ayrı ölçüm istasyonunda yapılan ölçümler sonucunda elde edilen günlük değerler aşağıdaki tablolarda verilmiştir.

**Tablo 2:** Gürültü Ölçüm Noktaları

| ÖLÇÜM TARİHİ | ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|---|
| 19-20-21.09.2022 | 1.NOKTA | 506305 | 4525655 |
| 19-20-21.09.2022 | 2.NOKTA | 507031 | 4525866 |
| 19-20-21.09.2022 | 3.NOKTA | 512427 | 4524843 |
| 19-20-21.09.2022 | 4.NOKTA | 508330 | 4528503 |
| 19-20-21.09.2022 | 5.NOKTA | 511338 | 4529049 |
| 19-20-21.09.2022 | 6.NOKTA | 512467 | 4527409 |
| 19-20-21.09.2022 | 7.NOKTA | 514646 | 4529426 |
| 19-20-21.09.2022 | 8.NOKTA | 517259 | 4531150 |
| 19-20-21.09.2022 | 9.NOKTA | 518051 | 4529260 |
| 19-20-21.09.2022 | 10.NOKTA | 520917 | 4531575 |
| 19-20-21.09.2022 | 11.NOKTA | 523263 | 4530892 |
| 19-20-21.09.2022 | 12.NOKTA | 523420 | 4532270 |
| 19-20-21.09.2022 | 13.NOKTA | 525119 | 4531796 |
| 19-20-21.09.2022 | 14.NOKTA | 526797 | 4533237 |
| 19-20-21.09.2022 | 15.NOKTA | 527788 | 4532359 |
| 19-20-21.09.2022 | 16.NOKTA | 529595 | 4535479 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| ÖLÇÜM TARİHİ | ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|---|
| 19-20-21.09.2022 | 17.NOKTA | 526415 | 4540060 |
| 22-23-24.09.2022 | 18.NOKTA | 529124 | 4539988 |
| 22-23-24.09.2022 | 19.NOKTA | 531283 | 4536793 |
| 22-23-24.09.2022 | 20.NOKTA | 532721 | 4533447 |
| 22-23-24.09.2022 | 21.NOKTA | 531835 | 4540360 |
| 22-23-24.09.2022 | 22.NOKTA | 536037 | 4539511 |
| 22-23-24.09.2022 | 23.NOKTA | 536542 | 4538859 |
| 22-23-24.09.2022 | 24.NOKTA | 537822 | 4539890 |
| 22-23-24.09.2022 | 25.NOKTA | 539409 | 4540872 |
| 22-23-24.09.2022 | 26.NOKTA | 540433 | 4541503 |
| 22-23-24.09.2022 | 27.NOKTA | 540972 | 4541731 |
| 22-23-24.09.2022 | 28.NOKTA | 543153 | 4541309 |
| 22-23-24.09.2022 | 29.NOKTA | 544195 | 4540054 |
| 22-23-24.09.2022 | 30.NOKTA | 544143 | 4541845 |
| 22-23-24.09.2022 | 31.NOKTA | 545250 | 4541470 |
| 22-23-24.09.2022 | 32.NOKTA | 546710 | 4539397 |
| 22-23-24.09.2022 | 33.NOKTA | 548594 | 4539813 |
| 22-23-24.09.2022 | 34.NOKTA | 548702 | 4539430 |
| 26-27-28.09.2022 | 35.NOKTA | 549590 | 4541426 |
| 26-27-28.09.2022 | 36.NOKTA | 550732 | 4538585 |
| 26-27-28.09.2022 | 37.NOKTA | 552634 | 4538395 |
| 26-27-28.09.2022 | 38.NOKTA | 553205 | 4542665 |
| 26-27-28.09.2022 | 39.NOKTA | 552392 | 4544143 |
| 26-27-28.09.2022 | 40.NOKTA | 555979 | 4543687 |
| 26-27-28.09.2022 | 41.NOKTA | 560252 | 4541819 |
| 26-27-28.09.2022 | 42.NOKTA | 562553 | 4548347 |
| 26-27-28.09.2022 | 43.NOKTA | 568345 | 4548605 |

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| ÖLÇÜM TARİHİ | ÖLÇÜM NOKTASI NUMARASI | LOKASYON BİLGİSİ | |
|---|---|---|---|
| 26-27-28.09.2022 | 44.NOKTA | 569552 | 4546811 |
| 26-27-28.09.2022 | 45.NOKTA | 570179 | 4544494 |
| 26-27-28.09.2022 | 46.NOKTA | 571562 | 4544339 |
| 26-27-28.09.2022 | 47.NOKTA | 574486 | 4548016 |
| 26-27-28.09.2022 | 48.NOKTA | 575241 | 4549476 |
| 26-27-28.09.2022 | 49.NOKTA | 578864 | 4549330 |
| 26-27-28.09.2022 | 50.NOKTA | 576549 | 4551913 |
| 29-30.09.2022-01.10.2022 | 51.NOKTA | 576082 | 4547948 |
| 29-30.09.2022-01.10.2022 | 52.NOKTA | 580171 | 4547562 |
| 29-30.09.2022-01.10.2022 | 53.NOKTA | 580496 | 4543967 |
| 29-30.09.2022-01.10.2022 | 54.NOKTA | 580799 | 4538260 |
| 29-30.09.2022-01.10.2022 | 55.NOKTA | 584542 | 4543854 |
| 29-30.09.2022-01.10.2022 | 56.NOKTA | 585300 | 4548362 |
| 29-30.09.2022-01.10.2022 | 57.NOKTA | 588163 | 4548683 |
| 29-30.09.2022-01.10.2022 | 58.NOKTA | 586483 | 4550069 |
| 29-30.09.2022-01.10.2022 | 59.NOKTA | 588893 | 4551242 |
| 29-30.09.2022-01.10.2022 | 60.NOKTA | 588815 | 4554539 |
| 29-30.09.2022-01.10.2022 | 61.NOKTA | 590046 | 4559119 |
| 29-30.09.2022-01.10.2022 | 62.NOKTA | 591887 | 4549969 |
| 29-30.09.2022-01.10.2022 | 63.NOKTA | 594478 | 4549785 |
| 29-30.09.2022-01.10.2022 | 64.NOKTA | 596088 | 4549563 |
| 29-30.09.2022-01.10.2022 | 65.NOKTA | 595540 | 4551889 |
| 29-30.09.2022-01.10.2022 | 66.NOKTA | 599082 | 4551542 |

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**vii Ölçüm Sonuçları**

**Belirlenen her ölçüm noktasında ölçülen titreşim hızı, frekansı,**

Titreşim etkisine neden olabilecek kaynaklar ve bunların en yakın yapıya olan mesafeleri aradaki iletimi sağlayacak jeolojik formasyon göz önüne alınarak değerlendirildiğinde mümkün olabilecek (Titreşim kaynakları ve mümkün olan çalışma şartları irdelendiğinde) en yüksek titreşim salınımlarında ölçümler gerçekleştirilmiş ve sonuçlar aşağıda sunulmuştur.

**Çevresel titreşim değerlerinin ÇGDYY Madde 25 kapsamında değerlendirilmesi.**

ÇEVRESEL GÜRÜLTÜNÜN DEĞERLENDİRİLMESİ VE YÖNETİMİ YÖNETMELİĞİ

EK-VII Tablo – 7: İnşaatlarda Kazık Çakma ve Benzeri Titreşim Yaratan Operasyonların ve İnşaat Makinelerinin En Yakın Çok Hassas (Ek ibare:RG-27/4/2011-27917)ve HassasKullanım Alanının Dışında Yaratacağı Zemin Titreşimlerinin İzin Verilen En Yüksek Değerleri (1 Hz- 80 Hz arasındaki frekans bantlarında)

| | **İzin Verilen En Yüksek Titreşim Hızı (Tepe Değeri-mm/s)** | |
|---|---|---|
| | Sürekli Titreşim | Kesikli Titreşim |
| **Yerleşim Bölgelerinde** | 5 | 10 |
| **Sanayi ve Ticari Bölgelerde** | 15 | 30 |

Ölçülen değerler Tablo 1'de verilmiş olup Tablo 21'de verilen sınır değerlerin altında kalmaktadır.

**Tablo :1** Titreşim Ölçüm Sonuçları

| **Ölçüm Yeri Adı** | **Ölçüm Sonuçları (RMS Değeri – mm/s)** | | |
|---|---|---|---|
| | X | Y | Z |
| 1.NOKTA | 1,462847 | 1,281995 | 1,78599 |
| 2.NOKTA | 1,337594 | 1,150593 | 1,83251 |
| 3.NOKTA | 1,34391 | 1,183282 | 1,973902 |
| 4.NOKTA | 1,454218 | 1,342783 | 2,000917 |
| 5.NOKTA | 1,374954 | 1,293011 | 1,945604 |
| 6.NOKTA | 1,178303 | 1,175392 | 1,599154 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri Adı | Ölçüm Sonuçları (RMS Değeri – mm/s) | | |
|---|---|---|---|
| | X | Y | Z |
| 7.NOKTA | 1,294531 | 1,170012 | 1,773143 |
| 8.NOKTA | 1,310736 | 1,207521 | 1,827525 |
| 9.NOKTA | 1,267371 | 1,169133 | 1,818726 |
| 10.NOKTA | 1,339034 | 1,262489 | 1,731324 |
| 11.NOKTA | 1,322704 | 1,307728 | 1,917408 |
| 12.NOKTA | 1,415376 | 1,142429 | 1,835702 |
| 13.NOKTA | 1,320699 | 1,172099 | 2,031226 |
| 14.NOKTA | 1,386818 | 1,207088 | 1,940538 |
| 15.NOKTA | 1,287696 | 1,123689 | 1,906746 |
| 16.NOKTA | 1,370786 | 1,155289 | 1,91751 |
| 17.NOKTA | 1,300756 | 1,117859 | 1,760476 |
| 18.NOKTA | 1,388625 | 1,206211 | 1,699128 |
| 19.NOKTA | 1,442082 | 1,218858 | 1,828191 |
| 20.NOKTA | 1,349976 | 1,132531 | 1,765307 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri Adı | Ölçüm Sonuçları (RMS Değeri – mm/s) | | |
|---|---|---|---|
| | X | Y | Z |
| 21.NOKTA | 1,415203 | 1,235722 | 1,873773 |
| 22.NOKTA | 1,35097 | 1,173592 | 1,666986 |
| 23.NOKTA | 1,267207 | 1,084505 | 1,761683 |
| 24.NOKTA | 1,345061 | 1,090709 | 1,823955 |
| 25.NOKTA | 1,407357 | 1,220678 | 1,953536 |
| 26.NOKTA | 1,368822 | 1,193367 | 1,889507 |
| 27.NOKTA | 1,285557 | 1,16172 | 1,767014 |
| 28.NOKTA | 1,397293 | 1,203152 | 1,797552 |
| 29.NOKTA | 1,383599 | 1,163095 | 1,873357 |
| 30.NOKTA | 1,441714 | 1,219601 | 1,722449 |
| 31.NOKTA | 1,391865 | 1,135059 | 1,848099 |
| 32.NOKTA | 1,344091 | 1,247185 | 1,713532 |
| 33.NOKTA | 1,418471 | 1,153969 | 1,696519 |
| 34.NOKTA | 1,336713 | 1,247958 | 1,69814 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri Adı | Ölçüm Sonuçları (RMS Değeri – mm/s) | | |
|---|---|---|---|
| | X | Y | Z |
| 35.NOKTA | 1,257022 | 1,136214 | 1,788399 |
| 36.NOKTA | 1,380808 | 1,079821 | 1,750279 |
| 37.NOKTA | 1,282124 | 1,079033 | 1,698428 |
| 38.NOKTA | 1,378262 | 1,206009 | 1,785546 |
| 39.NOKTA | 1,375742 | 1,236333 | 1,962492 |
| 40.NOKTA | 1,382472 | 1,239014 | 1,883045 |
| 41.NOKTA | 1,340196 | 1,223695 | 1,709178 |
| 42.NOKTA | 1,253294 | 1,178507 | 1,703801 |
| 43.NOKTA | 1,284795 | 1,096285 | 1,765327 |
| 44.NOKTA | 1,419987 | 1,167537 | 1,805636 |
| 45.NOKTA | 1,352645 | 1,262746 | 1,929147 |
| 46.NOKTA | 1,328689 | 1,136172 | 1,967042 |
| 47.NOKTA | 1,375445 | 1,277024 | 1,682368 |
| 48.NOKTA | 1,370495 | 1,118321 | 1,765589 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri Adı | Ölçüm Sonuçları (RMS Değeri – mm/s) | | |
|---|---|---|---|
| | X | Y | Z |
| 49.NOKTA | 1,418961 | 1,243535 | 1,73241 |
| 50.NOKTA | 1,297467 | 1,116075 | 1,777535 |
| 51.NOKTA | 1,303593 | 1,147784 | 1,914685 |
| 52.NOKTA | 1,410592 | 1,3025 | 1,940889 |
| 53.NOKTA | 1,333705 | 1,25422 | 1,887236 |
| 54.NOKTA | 1,142954 | 1,140131 | 1,55118 |
| 55.NOKTA | 1,255695 | 1,134912 | 1,719949 |
| 56.NOKTA | 1,271414 | 1,171295 | 1,772699 |
| 57.NOKTA | 1,22935 | 1,134059 | 1,764164 |
| 58.NOKTA | 1,285472 | 1,211989 | 1,662071 |
| 59.NOKTA | 1,269796 | 1,255418 | 1,840712 |
| 60.NOKTA | 1,24699 | 1,126868 | 1,714003 |
| 61.NOKTA | 1,355374 | 1,167058 | 1,743625 |
| 62.NOKTA | 1,342091 | 1,128202 | 1,817156 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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| Ölçüm Yeri Adı | Ölçüm Sonuçları (RMS Değeri – mm/s) | | |
|---|---|---|---|
| | X | X | X |
| 63.NOKTA | 1,398462 | 1,183013 | 1,670775 |
| 64.NOKTA | 1,350109 | 1,101007 | 1,792656 |
| 65.NOKTA | 1,303768 | 1,20977 | 1,662126 |
| 66.NOKTA | 1,35749 | 1,38720 | 1,60837 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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# EK-1 AKREDİTASYON BELGESİ

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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Türk Akreditasyon Kurumu

# AKREDİTASYON SERTİFİKASI

Deney Laboratuvarı olarak faaliyet gösteren,

**BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜHENDİSLİK MÜŞAVİRLİK SANAYİ VE TİCARET LİMİTED ŞİRKETİ**

Merkez Adres: İNÖNÜ MAHALLESİ 1738.SOKAK NO:1/10 YENİMAHALLE Ankara / Türkiye

TÜRKAK tarafından yapılan denetim sonucunda TS EN ISO/IEC 17025:2017 standardına göre Ek'te yer alan kapsamlarda akredite edilmiştir.

**Akreditasyon No : AB-0946-T**

**Akreditasyon Tarihi : 31.10.2015**

**Revizyon Tarihi / No : 27.05.2022 / 08**

Bu Sertifika, yukarıda açık adı ve adresi yazılı Kuruluşun TS EN ISO/IEC 17025:2017 Standardına, ilgili Yönetmelik ve Tebliğlere uygunluğunu sürdürmesi halinde **24.02.2024** tarihine kadar geçerlidir.

Gülden Banu Müderrisoğlu
Genel Sekreter

Türk Akreditasyon Kurumu (TÜRKAK) ISO/IEC 17025 alanında Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile çok taraflı anlaşma (MLA/MRA) imzalamıştır.

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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**BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜHENDİSLİK MÜŞAVİRLİK SANAYİ VE TİCARET LİMİTED ŞİRKETİ**

Akreditasyon No: AB-0946-T
Revizyon No: 08 Tarih: 27.05.2022

Deney Laboratuvarı

Adresi : İNONU MAHALLESİ 1738 SOKAK NO 1/10 YENİMAHALLE Ankara / Türkiye

Telefon : +90 3122508485
Fax : -
E-Posta : info@batilaboratuvari.com.tr
Web Sitesi :

İş Hijyeni Ölçüm, Test ve Analizleri

| Deneyi Yapılan Malzemeler / Ürünler | Deney Adı | Deney Metodu (Ulusal, Uluslararası Standartlar, İşletme-içi Metotlar) |
|---|---|---|
| İş Hijyeni<br>Dedektör Tüple Gaz Ölçümü | Zehirli Gaz veya Buhar Konsantrasyonlarının Tayini<br>(Bu kapsamda talep edilen bileşik isimleri açık olarak yazılacaktır.)<br>Numune Alma ve Ölçüm: Dedektör Tüple Anlık Ölçüm<br>Numune Alma ve Ölçüm: Pompa ve Dedektör Tüple Uzun Vadeli Aktif Ölçüm<br>Numune Alma ve Ölçüm: Dozimetre Tüpü İle Uzun Vadeli Pasif Ölçüm | ASTM D4490-96 |
| İş Hijyeni<br>Toz Ölçümü | Toplam ve Solunabilir Toz Tayini<br>Numune Alma: Pompa ile Filtreye Numune Alma<br>Ölçüm: Gravimetrik Metot | HSE-MDHS 14/3 |
| İş Hijyeni<br>Gürültü | Çalışma Ortamında Maruz Kalınan Gürültünün Ölçülmesi | TS EN ISO 9612 |
| İş Hijyeni<br>Titreşim | Kişilerin Maruz Kaldığı, Elle İletilen Titreşimin Ölçülmesi ve Değerlendirilmesi | TS EN ISO 5349-1<br>TS EN ISO 5349-2 |
| İş Hijyeni<br>Titreşim | Tüm Vücudun Titreşime Maruz Kalmasının Ölçülmesi ve Değerlendirilmesi | TS ISO 2631-1 (TS EN 1032+A1 ile birlikte) |
| İş Hijyeni<br>Titreşim | Hareketli Makinaların Deneye Tabi Tutulması ile Titreşim Emisyon Değerinin Tespiti | TS EN 1032+A1 |
| İş Hijyeni<br>Manyetik Alan | İnsanların Elektrik, Manyetik ve Elektromanyetik Alanlara Maruz Kalmasının Ölçülmesi | TS EN 50413 |
| İş Hijyeni<br>Aydınlatma | İş Yerlerindeki Aydınlatma Işık Şiddeti Düzeyinin Ölçümü | COHSR-928-1-IPG-039 |
| İş Hijyeni<br>Termal Konfor | Orta Dereceli Termal Ortamlar için PMV ve PPD İndislerinin Tayini, Termal Rahatlık İçin Şartların Belirlenmesi | TS EN ISO 7730 |
| İş Hijyeni<br>Termal Konfor | Termal Çevrenin Ergonomisi - WBGT (Islak Ampul Küresel Sıcaklık) Efideksi Kullanılarak Isı Stresinin Değerlendirilmesi | TS EN ISO 7243 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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## BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜHENDİSLİK MÜŞAVİRLİK SANAYİ VE TİCARET LİMİTED ŞİRKETİ

Akreditasyon No: AB-0946-T
Revizyon No: 08 Tarih: 27.05.2022

**Çevresel Deneyler**

| Deneyi Yapılan Malzemeler / Ürünler | Deney Adı | Deney Metodu (Ulusal, Uluslararası Standartlar, İşletme-içi Metotlar) |
|---|---|---|
| Baca Gazı | Sabit Kaynak Emisyonları-Bacalarda Gaz Akış Hız ve Debi Tayini<br>Ölçüm: L Tipi Pitot Tüpü<br>Ölçüm: S Tipi Pitot Tüpü | TS ISO 10780 * |
| İmisyon (Çevre Havası) | Askıdaki Tanecikli Maddenin PM10 veya PM 2,5 Kütle Derişimlerinin Tayini<br>Gravimetrik Metot | TS EN 12341 |
| İmisyon (Çevre Havası) | Çöken Toz Tayini<br>Gravimetrik Metot | TS 2342 |
| Akustik-Gürültü | Akustik-Çevre Gürültüsünün Tarifi, Ölçülmesi ve Değerlendirilmesi - Bölüm 1: Temel Büyüklükler ve Değerlendirme İşlemleri | TS ISO 1996-1 |
| Akustik-Gürültü | Akustik-Çevresel Gürültünün Tanımı, Ölçümü ve Değerlendirilmesi - Bölüm 2: Ses Basıncı Seviyelerinin Belirlenmesi | TS ISO 1996-2 |
| Akustik-Gürültü | Gürültü Kaynaklarının Ses Gücü Seviyelerinin ve Ses Enerji Seviyelerinin Ses Basıncı Kullanılarak Belirlenmesi - Yansıtıcı Bir Düzlem Üzerindeki Temel Olarak Serbest Bir Alanda Uygulanan Mühendislik Yöntemleri | TS EN ISO 3744 |
| Akustik-Gürültü | Gürültü Kaynaklarının Ses Gücü Seviyelerinin ve Ses Enerji Seviyelerinin Ses Basıncı Kullanılarak Belirlenmesi - Yansıtıcı Bir Düzlem Üzerinde Çevreleyici Bir Ölçüm Yüzeyinin Kullanıldığı Gözlem Yöntemi | TS EN ISO 3746 |
| Akustik-Gürültü | Çoklu Gürültü Kaynağına Sahip Sanayi Tesislerinde Yapılan Ses Basıncı Düzeyi Ölçümlerinden Ses Gücü Düzeyinin ($\Delta L_1$, $\Delta L_t$, $\Delta L_{ti}$, $\Delta L_{ti}$, $L_{pfA}$, $L_w$) Tespiti | TS ISO 8297 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti'** nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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|---|---|---|
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| Akustik-Gürültü | Sesin Dışarıda Yayılırken Azalması - Bölüm 1: Sesin Atmosfer Tarafından Soğrulmasının Hesaplanması | TS ISO 9613-1 |
| Akustik-Gürültü | Sesin Dışarıda Yayılırken Azalması - Bölüm 2: Genel Hesaplama Yöntemi | TS ISO 9613-2 |
| Titreşim | Madencilik Faaliyetleri Sonucunda Oluşan Hava Şoku ve Yer Titreşiminin Ölçülmesi (a, v) | TS 10354 |
| Titreşim | Binalarda Titreşimin Ölçülmesi ve Yapı Hasarının Tespiti (tr, a, V) | TS ISO 4866 |
| Titreşim | Hidrolik Güç Kaynakları ve Pompa Tesisatlarındaki Makine Setlerinin Dönmeyen Parçalarında Titreşimin Ölçülmesi ve Değerlendirilmesi ($V_{rms}$) | ISO 10816-5 |

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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# EK -2 ÖLÇÜM CİHAZINA AİT BELGELER

rapor yalnızca **KINALI MALKARA YÜKSEK HIZLI TREN PROJESİ** mahallerinde **19-20-21.09.2022 / 22-23-24.09.2022 / 26-27-28.09.2022 / 29-30.09.2022-01.10.2022** tarihlerinde yapılan **Gürültü ve Titreşim Ölçümleri** için geçerli olup **Batı Laboratuvarı Çevre Ölçüm Hizmetleri Bilişim Müh. Müş. San. ve Tic. Ltd. Şti**' nin yazılı onayı olmadan kopyalanıp çoğaltılamaz. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. İmzasız ve mühürsüz raporlar geçersizdir. Deney sonuçları, sadece ölçüm sırasındaki işletme koşulları ile ilgilidir.
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*e-posta: info@pentaotomasyon.com.tr*
*web: www.pentaotomasyon.com.tr*

AB-0113-K
A-2204547/01
09-22

**Kalibrasyon Sertifikası**
*Certificate of Calibration*

| | |
|---|---|
| **Cihazın Sahibi / Adresi** *Customer / Address* | : BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜHENDİSLİK MÜŞAVİRLİK SANAYİ VE TİCARET LİMİTED ŞİRKETİ İNÖNÜ MAH. Cemsa iş merkezi yıldırımlar sanayi sitesi 1738.SOKAK No:1 Daire:10 YENİMAHALLE/AN |
| **İstek Numarası** *Order No.* | : 2204547 |
| **Makine / Cihaz** *Instrument / Device* | : Ses Seviyesi Ölçer |
| **İmalatçı** *Manufacturer* | : CESVA |
| **Tip** *Type* | : SC310 |
| **Seri Numarası** *Serial Number* | : - |
| **Penta Kodu** *Penta Code* | : 2204547/01 |
| **Kalibrasyon Tarihi** *Date of Calibration* | : 14.09.2022 |
| **Sertifikanın Sayfa Sayısı** *Number of pages of the certificate* | : 4 |

Bu kalibrasyon sertifikası, Uluslararası Birimler Sistemi'nde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.
*This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).*

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.
*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2017 standardına göre akredite edilmiştir.
*Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2017 as Calibration Laboratory"*

Türk Akreditasyon Kurumu (TÜRKAK) kalibrasyon sertifikalarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile kargıdaki tanınma anlaşmasını imzalamıştır. *(The Turkish accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation (EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognition of calibration certificates.*

| Mühür *Seal* | Yayımlandığı Tarih *Date* | Kalibrasyonu Yapan *Calibrated by* | Onaylayan / *Approval* |
|---|---|---|---|
| | 14.09.2022 | Kalibrasyon Sorumlusu<br>**Yılmaz OCAK**<br>SN: 37a36c384a39d3c44aca<br>*e-imzalıdır* | **Tarih** / *Date*<br>Teknik Müdür<br>**Nergiz TEKİN**<br>SN: 0300185b70d2e8edac0f81<br>*e-imzalıdır*<br>2022.09.16 16:15:26+03'00' |

*Tel: 0 216 523 63 47* *Fax: 0 212 243 63 41* *web: www.kalibrasyonlaboratuvari.com.tr* *e-mail: info@pentakalibrasyon.com*

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçerlidir. *This result in this certificate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid.*

FR-18/43 /Rev: No: 03 /17.11.2020



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*web: www.pentaotomasyon.com.tr*

AB-0113-K
A-2204547/02
09-22

**Kalibrasyon Sertifikası**
*Certificate of Calibration*

| | |
|---|---|
| **Cihazın Sahibi / Adresi** *Customer / Address* | : BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜHENDİSLİK MÜŞAVİR İNÖNÜ MAH. Cemsa iş merkezi yıldırımlar sanayi sitesi 1738.SOKAK No:1 Daire:10 YENİMAHALLE/A |
| **İstek Numarası** *Order No.* | : 2204547 |
| **Makine / Cihaz** *Instrument / Device* | : Ses Kalibratörü |
| **İmalatçı** *Manufacturer* | : CESVA |
| **Tip** *Type* | : CB006 |
| **Seri Numarası** *Serial Number* | : - |
| **Penta Kodu** *Penta Code* | : 2204547/02 |
| **Kalibrasyon Tarihi** *Date of Calibration* | : 14.09.2022 |
| **Sertifikanın Sayfa Sayısı** *Number of pages of the certificate* | : 3 |

Bu kalibrasyon sertifikası, Uluslararası Birimler Sistemi'nde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.
*This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).*

Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.
*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

Kalibrasyon laboratuvarı olarak faaliyet gösteren Penta Otomasyon, TÜRKAK'tan AB-0113-K ile TS EN ISO / IEC 17025:2017 standardına göre akredite edilmiştir.
*Penta Otomasyon accredited by TÜRKAK under registration number AB-0113-K & TS EN ISO / IEC 17025:2017 as Calibration Laboratory"*

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| Mühür *Seal* | Yayımlandığı Tarih *Date* | Kalibrasyonu Yapan *Calibrated by* | Onaylayan / *Approval* |
|---|---|---|---|
| | 14.09.2022 | Kalibrasyon Sorumlusu<br>**Yılmaz OCAK**<br>SN: 37a36c384a39d3c44aca<br>*e-imzalıdır* | **Tarih** / *Date*<br>Teknik Müdür<br>**Nergiz TEKİN**<br>SN: 0300185b70d2e8edac0f81<br>*e-imzalıdır*<br>2022.09.16 16:15:15+03'00' |

*Tel: 0 216 523 63 47* *Fax: 0 212 243 63 41* *web: www.kalibrasyonlaboratuvari.com.tr* *e-mail: info@pentakalibrasyon.com*

Bu sertifikadaki sonuçlar, cihazın kalibrasyon tarihindeki durumunu kapsamaktadır. Bu sertifika, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. İmzasız sertifikalar geçerlidir. *This result in this certificate refer to condition of the instrument on the date of calibration. This certificate shall not be reproduced other than in full except with the permission of the laboratory. This certificate is signed using secure digital signature according to article of law, number 5070. Calibration certificates without signature are not valid.*

FR-18/44 / Rev.03 /17.11.2020

AVL Kalibrasyon Laboratuarı

**AVL AKUSTİK VİBRASYON KALİBRASYON LAB. LTD. ŞTİ.**
A: İvedik O.S.B Denciler Sit. 1385. Sok No: 10 Ostim / Ankara
T: +90 (312) 394 15 50 F: +90 (312) 394 15 53 E: bilgi@avl.com.tr W: www.avl.com.tr

TÜRKAK
AB-0089-K
212249
10-21

**KALİBRASYON SERTİFİKASI**
*Calibration Certificate*

| | | |
|---|---|---|
| **Cihazın Sahibi** *Customer Name* | : | BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. MÜŞ. SAN. TİC. LTD. ŞTİ. İnönü Mh. Yıldırımlar San. Sit. 1738 Sk. 1/10 Batıkent / ANKARA |
| **İstek Numarası** *Order No.* | : | T-1021-064 |
| **Makine / Cihaz** *Instrument / Device* | : | Akustik Kalibratör *Acoustic Calibrator* |
| **İmalatçı** *Manufacturer* | : | CESVA |
| **Tip** *Type* | : | CB006 |
| **Seri Numarası** *Serial number* | : | 900779 |
| **Kalibrasyon Tarihi** *Date of calibration* | : | 22.10.2021 |
| **Sertifika Sayfa Sayısı** *Number of pages* | : | 4 |

Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.
*This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the international system of Units (SI).*
Kalibrasyon laboratuvarı olarak faaliyet gösteren AVL Kalibrasyon Laboratuvarı, TÜRKAK'tan AB-0089-K dosya numarası ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.
*AVL Kalibrasyon Laboratuvarı is accredited by TÜRKAK under registration number AB-0089-K for TS EN ISO/IEC 17025:2017 as test laboratory.*
Türk Akreditasyon Kurumu(TÜRKAK) deney raporlarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma anlaşmasını imzalamıştır.
*The Turkish Accreditation Acency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognation of test reports.*
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*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

| Mühür / Kaşe *Seal* | Yayım Tarihi *Publication Date* | Kalibrasyonu Yapan *Calibrated By* | Onaylayan / Tarih *Approval / Date* |
|---|---|---|---|
| AVL Kalibrasyon | 22.10.2021 | Fatma SOLGUNTEKİN<br>Kalibrasyon Personeli<br>*Calibration Responsible*<br>e-imzalıdır | Younes NEVAYESHİRAZİ / 22.10.2021<br>Laboratuvar Müdürü<br>*Laboratory Manager*<br>e-imzalıdır |

Bu sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. Belge teyidi için sayfalarda yer alan karekodu okutabilirsiniz.
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T: +90 (312) 394 15 50 F: +90 (312) 394 15 53 E: bilgi@avl.com.tr W: www.avl.com.tr

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**KALİBRASYON SERTİFİKASI**
*Calibration Certificate*

| | |
|---|---|
| **Cihazın Sahibi / Adresi:** *Customer / Address:* | BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. MÜŞ. SAN. TİC. LTD. ŞTİ. İnönü Mh. Yıldırımlar San. Sit. 1738 Sk. 1/10 Batıkent / ANKARA |
| **Talep Numarası:** *Order No:* | T-1021-064 / 1 - L04 |
| **Makina / Cihaz:** *Instrument / Device:* | Titreşim Ölçer / X Yönü<br>Vibration Meter / X Axis |
| **İmalatçı:** *Manufacturer:* | CESVA |
| **Tip:** *Type:* | VC431 / AC031 |
| **Seri No / Cihaz Kodu:** *Serial No / Product Code:* | T240010 / 0906299 |
| **Kalibrasyon Tarihi:** *Date of Calibration:* | 22.10.2021 |
| **Sertifikanın Sayfa Sayısı:** *Number of Pages:* | 5 |

**Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.**
*This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).*
**Kalibrasyon laboratuvarı olarak faaliyet gösteren AVL AKUSTİK VİBRASYON KALİBRASYON LAB. LTD. ŞTİ, TÜRKAK'tan AB-0089-K dosya numarası ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**
*AVL AKUSTİK VİBRASYON KALİBRASYON LAB. LTD. ŞTİ is accredited by TÜRKAK under registration number AB-0089-K for TS EN ISO/IEC 17025:2017 as calibration laboratory.*
**Türk Akreditasyon Kurumu(TÜRKAK) kalibrasyon sertifikalarının tanınması konusunda Avrupa Akreditasyon Birliği (EA) ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanınma antlaşmasını imzalamıştır.**
*The Turkish Accreditation Agency (TURKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognation of calibration certificates.*
**Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.**
*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

| Mühür / Kaşe *Seal* | Yayım Tarihi *Publication Date* | Kalibrasyonu Yapan *Calibrated by* | Onaylayan / Tarih *Approval / Date* |
|---|---|---|---|
| AVL Kalibrasyon | 22.10.2021 | Fatma SOLGUNTEKİN<br>Kalibrasyon Personeli<br>*Calibration Responsible*<br>e-imzalıdır | Younes NEVAYESHİRAZİ / 22.10.2021<br>Laboratuvar Müdürü<br>*Laboratory Manager*<br>e-imzalıdır |

Bu sertifika laboratuvarın izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. Kare kodsuz veya elektronik imzasız sertifikalar geçersizdir. Sertifikada yer alan kare kod mobil cihazlardan okutularak sertifika doğrulanabilir.
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212252
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## KALİBRASYON SERTİFİKASI
*Calibration Certificate*

| | |
|---|---|
| **Cihazın Sahibi / Adresi:** *Customer / Address:* | BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. MÜŞ. SAN. TİC. LTD. ŞTİ. İnönü Mh. Yıldırımlar San. Sit. 1736 Sk. 1/10 Batıkent / ANKARA |
| **Talep Numarası:** *Order No:* | T-1021-084 / 1 - L05 |
| **Makina / Cihaz:** *Instrument / Device:* | Titreşim Ölçer / Y Yönü<br>Vibration Meter / Y Axis |
| **İmalatçı:** *Manufacturer:* | CESVA |
| **Tip:** *Type:* | VC431 / AC031 |
| **Seri No / Cihaz Kodu:** *Serial No / Product Code:* | T240010 / 0906299 |
| **Kalibrasyon Tarihi:** *Date of Calibration:* | 22.10.2021 |
| **Sertifikanın Sayfa Sayısı:** *Number of Pages:* | 5 |

**Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.**
*This calibration certificate documents the traceability to national standards, which realize the unit of measurement according to the International System of Units (SI).*
**Kalibrasyon laboratuvarı olarak faaliyet gösteren AVL AKUSTİK VİBRASYON KALİBRASYON LAB. LTD. ŞTİ, TÜRKAK'tan AB-0089-K dosya numarası ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**
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*The Turkish Accreditation Agency (TÜRKAK) is signatory to the multilateral agreements of the European co-operation for the Accreditation(EA) and of the International Laboratory Accreditation (ILAC) for the Mutual recognition of calibration certificates.*
**Ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri ve kalibrasyon metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.**
*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

| Mühür / Kaşe *Seal* | Yayım Tarihi *Publication Date* | Kalibrasyonu Yapan *Calibrated by* | Onaylayan / Tarih *Approval / Date* |
|---|---|---|---|
| AVL Kalibrasyon | 22.10.2021 | Fatma SOLGUNTEKİN<br>Kalibrasyon Personeli<br>*Calibration Responsible*<br>e-imzalıdır | Younes NEVAYESHİRAZİ / 22.10.2021<br>Laboratuvar Müdürü<br>*Laboratory Manager*<br>e-imzalıdır |

Bu sertifika laboratuvarın izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. Kare kodsuz veya elektronik imzasız sertifikalar geçersizdir. Sertifikada yer alan kare kod mobil cihazlardan okutularak sertifika doğrulanabilir.
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## KALİBRASYON SERTİFİKASI
*Calibration Certificate*

| | |
|---|---|
| **Cihazın Sahibi / Adresi:** *Customer / Address:* | BATI LABORATUVARI ÇEVRE ÖLÇÜM HİZMETLERİ BİLİŞİM MÜH. MÜŞ. SAN. TİC. LTD. ŞTİ. İnönü Mh. Yıldırımlar San. Sit. 1736 Sk. 1/10 Batıkent / ANKARA |
| **Talep Numarası:** *Order No:* | T-1021-084 / 1 - L06 |
| **Makina / Cihaz:** *Instrument / Device:* | Titreşim Ölçer / Z Yönü<br>Vibration Meter / Z Axis |
| **İmalatçı:** *Manufacturer:* | CESVA |
| **Tip:** *Type:* | VC431 / AC031 |
| **Seri No / Cihaz Kodu:** *Serial No / Product Code:* | T240010 / 0906299 |
| **Kalibrasyon Tarihi:** *Date of Calibration:* | 22.10.2021 |
| **Sertifikanın Sayfa Sayısı:** *Number of Pages:* | 5 |

**Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.**
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*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

| Mühür / Kaşe *Seal* | Yayım Tarihi *Publication Date* | Kalibrasyonu Yapan *Calibrated by* | Onaylayan / Tarih *Approval / Date* |
|---|---|---|---|
| AVL Kalibrasyon | 22.10.2021 | Fatma SOLGUNTEKİN<br>Kalibrasyon Personeli<br>*Calibration Responsible*<br>e-imzalıdır | Younes NEVAYESHİRAZİ / 22.10.2021<br>Laboratuvar Müdürü<br>*Laboratory Manager*<br>e-imzalıdır |

Bu sertifika laboratuvarın izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. Kare kodsuz veya elektronik imzasız sertifikalar geçersizdir. Sertifikada yer alan kare kod mobil cihazlardan okutularak sertifika doğrulanabilir.
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## KALİBRASYON SERTİFİKASI
*Calibration Certificate*

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|---|---|
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| **Talep Numarası:** *Order No:* | T-1021-064 / 1 - L03 |
| **Makina / Cihaz:** *Instrument / Device:* | Titreşim Kalibratörü / Uyarıcı Vibration Calibrator |
| **İmalatçı:** *Manufacturer:* | YMC |
| **Tip:** *Type:* | VC-01 |
| **Seri No / Cihaz Kodu:** *Serial No / Product Code:* | 104201 |
| **Kalibrasyon Tarihi:** *Date of Calibration:* | 22.10.2021 |
| **Sertifikanın Sayfa Sayısı:** *Number of Pages:* | 3 |

**Bu kalibrasyon sertifikası, Uluslararası Birimler Sisteminde (SI) tanımlanmış birimleri realize eden ulusal ölçüm standartlarına izlenebilirliği belgeler.**
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*The measurements, the uncertainties with confidence probability and calibration methods are given on the following pages which are part of this certificate.*

| Mühür / Kaşe *Seal* | Yayım Tarihi *Publication Date* | Kalibrasyonu Yapan *Calibrated by* | Onaylayan / Tarih *Approval / Date* |
|---|---|---|---|
| AVL Kalibrasyon | 22.10.2021 | **Fatma SOLGUNTEKİN** Kalibrasyon Personeli *Calibration Responsible* e-imzalıdır | **Younes NEVAYESHİRAZİ / 22.10.2021** Laboratuvar Müdürü *Laboratory Manager* e-imzalıdır |

Bu sertifika laboratuvarın izni olmadan kısmen kopyalanıp çoğaltılamaz. Sertifika 5070 sayılı kanununa göre güvenli elektronik imza ile imzalanmıştır. Kare kodsuz veya elektronik imzasız sertifikalar geçersizdir. Sertifikada yer alan kare kod mobil cihazlardan okutularak sertifika doğrulanabilir.
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230011**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

| | | |
|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1144-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:37:58 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-1 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 14/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230011 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230011 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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|---|
| AB-0183-T |
| 2003230012 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230012**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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|---|
| AB-0183-T |
| 2003230012 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

| | | |
|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1145-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:39:14 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-2 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 14/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230012 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

Adres : Bağlarbaşı Mah. Feyzullah Cad. No:119 Maltepe/İSTANBUL
Tel: 0216 459 61 10 (Pbx) 0216 441 40 50
www.aem.com.tr bilgi@aem.com.tr

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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

## Rapor No

**2003230013**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1146-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:40:26 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-13 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 14/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230013 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 65,1 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230014**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230014 |
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# ANALİZ RAPORU

*TEST REPORT*

| | | |
|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1147-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:41:32 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-14 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 14/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230014 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230015**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1148-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:42:31 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-15 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 14/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230015 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230015 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 458 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230016 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230016**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230016 |
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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1149-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:44:09 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-16 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 14/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230016 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
| --- | --- |
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
| --- | --- | --- | --- |
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
| --- | --- | --- |
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230017 |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230017**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230017 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1155-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:45:16 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-3 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 15/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230017 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230018**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1156-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:47:04 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-17 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 15/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230018 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 11,3 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230019**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1157-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:48:13 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-18 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 15/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230019 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 44,7 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

Adres : Bağlarbaşı Mah. Feyzullah Cad. No:119 Maltepe/İSTANBUL
Tel: 0216 459 61 10 (Pbx) 0216 441 40 50
www.aem.com.tr bilgi@aem.com.tr

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| AB-0183-T |
| 2003230020 |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

## Rapor No

**2003230020**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1158-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:49:10 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-21 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 15/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230020 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230020 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| DIN 38414-S18 | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | DIN 38414-S18 | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230008 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230008**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230008 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1159-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:31:59 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-4 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 16/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230008 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230008 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 116 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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www.aem.com.tr bilgi@aem.com.tr

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| AB-0183-T |
| 2003230009 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2003230009**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230009 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1160-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:34:13 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-19 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 16/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230009 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230009 |
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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 25,1 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

Adres : Bağlarbaşı Mah. Feyzullah Cad. No:119 Maltepe/İSTANBUL
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www.aem.com.tr bilgi@aem.com.tr

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| AB-0183-T |
| 2003230010 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

## Rapor No

**2003230010**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2003230010 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1161-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 20/03/2023 08:35:10 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-22 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 16/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2003230010 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 20/03/2023 23/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 23/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230011 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230011**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230011 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1170-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:21:19 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-20 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 16/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230011 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

| AB-0183-T |
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| 2103230011 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
| --- | --- |
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
| --- | --- | --- | --- |
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
| --- | --- | --- |
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230012 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230012**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230012 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1171-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:24:18 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-23 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 16/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230012 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 20,1 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230013**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1172-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:25:19 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-30 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230013 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

Adres : Bağlarbaşı Mah. Feyzullah Cad. No:119 Maltepe/İSTANBUL
Tel: 0216 459 61 10 (Pbx) 0216 441 40 50
www.aem.com.tr bilgi@aem.com.tr

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| AB-0183-T |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230014**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1173-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:26:16 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-6 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230014 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 158 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230015 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230015**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1174-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:28:04 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-29 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230015 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230015 |
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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 11,2 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

Adres : Bağlarbaşı Mah. Feyzullah Cad. No:119 Maltepe/İSTANBUL
Tel: 0216 459 61 10 (Pbx) 0216 441 40 50
www.aem.com.tr bilgi@aem.com.tr

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| AB-0183-T |
| 2103230016 |
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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230016**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1175-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:29:11 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-31 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230016 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230017 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230017**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1176-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:30:23 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-25 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230017 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 59,4 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230018**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230018 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1177-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:31:28 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-24 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230018 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230019 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230019**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230019 |
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## ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1178-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:33:00 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-8 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230019 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230019 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230020 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230020**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230020 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1179-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:34:11 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-27 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230020 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230020 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 34,6 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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Tel: 0216 459 61 10 (Pbx) 0216 441 40 50
www.aem.com.tr bilgi@aem.com.tr

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| AB-0183-T |
| 2103230021 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230021**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1180-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:35:34 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-7 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230021 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230021 |
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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230022 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230022**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230022 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1181-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:36:31 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-9 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230022 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 16,4 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

Adres : Bağlarbaşı Mah. Feyzullah Cad. No:119 Maltepe/İSTANBUL
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www.aem.com.tr bilgi@aem.com.tr

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| AB-0183-T |
| 2103230023 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2103230023**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230023 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1182-200mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 21/03/2023 13:37:49 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-26 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 17/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2103230023 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 21/03/2023 24/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 27/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2103230023 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 10,1 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2303230005 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230005**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2303230005 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

| | | |
|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1209-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:36:01 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-34 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 19/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230005 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

| AB-0183-T |
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| 2303230005 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 15 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230006**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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## ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1210-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:37:32 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-11 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 19/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230006 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

| AB-0183-T |
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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 24 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2303230007 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230007**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2303230007 |
| 3/2023 |

# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1211-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:38:40 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-12 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 19/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230007 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2303230007 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 16 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
| 2303230008 |
| 3/2023 |

# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230008**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| AB-0183-T |
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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1212-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:39:43 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-33 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 19/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230008 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

| AB-0183-T |
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| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 16 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230009**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1213-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:40:59 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-10 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 18/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230009 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 25 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230010**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1214-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:41:59 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-32 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 18/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230010 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230011**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1215-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:42:52 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-28 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 18/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230011 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | <10 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# Encon Laboratuvarı A.Ş.

# ANALİZ RAPORU

**Rapor No**

**2303230012**

**Reşit Galip Caddesi No: 120 Gaziosmanpaşa**
**Çankaya/Ankara/Türkiye**

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, labaratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# ANALİZ RAPORU

*TEST REPORT*

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|---|---|---|
| **Müşterinin Ünvanı :**<br>*Customer Name* | Encon Laboratuvarı A.Ş. | |
| **Müşterinin Adresi :**<br>*Customer address* | Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya/Ankara/Türkiye | |
| **Talep/Teklif No :**<br>*Order ID* | T230315-11/R00 | |
| **Numunenin Adı ve Tarifi:**<br>*The date of receipt of test item* | Toprak-NUM.23.1216-100mL | |
| **Numune Kabul Tarihi :**<br>*The date of receipt of test item* | 23/03/2023 11:43:56 | |
| **Numunenin Alındığı Yer :**<br>*Sampling area* | S-5 | |
| **Numunenin Alındığı Koordinatlar:**<br>*Sampling coordinates* | X: | Y: |
| **Numunenin Alındığı Tarih:**<br>*Date of sampling* | 18/03/2023 | |
| **Numune Alma Yöntemi:**<br>*Method of sampling* | - | |
| **Numuneyi Alan/Getiren:**<br>*Sampler* | Firma Çalışanı / Numune kargo ile gönderilmiştir. | |
| **Numune Kabının Cinsi:**<br>*Packaging of test item* | Plastik şişe | |
| **Numuneye Uygulanan İşlemler :**<br>*Applied pre-treatment of test item* | Soğuk Zincir | |
| **Barkod:**<br>*Sample ID* | 2303230012 | |
| **Deneyin Yapıldığı Tarih/Ölçüm Tarihi:**<br>*Date of test/sampling* | 23/03/2023 30/03/2023 | |
| **Raporun Sayfa Sayısı :**<br>*Number of pages* | 3 | |
| **Rapor Tarihi :**<br>*Report Date* | 30/03/2023 | |
| **Ölçüm ekibi tarafından alınan numuneler PR. 19 Numune Yönetim Prosedürüne uygun olarak PR. 19-PL.02 Haftalık Ölçüm / Numune Alma Takip Planı'na göre gerçekleşmiştir.** | | |

**Deney laboratuvarı olarak faaliyet gösteren AEM Çevre Laboratuvar Analiz Tic. A.Ş., TÜRKAK'tan AB-0183-T ile TS EN ISO/IEC 17025:2017 standardına göre akredite edilmiştir.**

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası Laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.**

Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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| 2303230012 |
| 3/2023 |

## ANALİZ RAPORU

*TEST REPORT*

| Metot Numarası | Metot Adı |
|---|---|
| İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | Mikrokulometrik Metot |

| Parametre | Analiz Metodu | Birim | Analiz Sonucu |
|---|---|---|---|
| Toplam Organik Halojenler (TOX) | İşletme İçi Metot D-TL.KATI17 R00 010615 (DIN 38414-18'den modifiye edilmiştir) | mg/kg | 69 |

Müşteri tarafından beyan edilen Numune Alma Yeri, Numune Alma Tarihi, Numune Miktarı ve Koruma Yöntemlerinden kaynaklı olumsuz durumlardan AEM Çevre Laboratuvar Analiz TİC. A.Ş. feragat eder.

| Laboratuvar Yöneticisi | Raporlama Sorumlusu | Laboratuvar Müdürü |
|---|---|---|
| Bahtiyar BALCI | Ebru ASAR | Safiye ÇAMUR EROL |
| Kimyager | Tekniker | Çevre Yüksek Mühendisi (Vekaleten) |

AEM ÇEVRE LABORATUVAR ANALIZ TIC. A.S. tarafından hazırlanan bu rapor, laboratuvarın yazılı izni olmadan kısmen kopyalanıp çoğaltılamaz. İmzasız ve mühürsüz veya e-imzasız raporlar geçersizdir. Raporda bulunan sonuçlar analizleri yapılan numuneye aittir.Bu rapor Çevre Mevzuatına ilişkin resmi işlemlerde kullanılamaz.

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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 9 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1140 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 512383/4505670) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW1 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C, EPA 8260 D |
| 37 °C'de koloni sayımı** | kob/ml | - | - | - | 116 | TS EN ISO 6222 |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 125 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 144.8 | EPA 3015 A, EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B,F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B,F |
| Anaerob sporlu sülfit redükte eden bakteriler** | kob/50ml | - | - | - | 26 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A, EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A, EPA 6020 B |
| Baryum | µg/L | - | - | - | 44.8 | EPA 200.7 |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C, EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C, EPA 8270 E |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bikarbonat (HCO3) | mg/L | - | - | - | 340.4 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2, TS EN ISO 17294-1/2, |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bromat | µg/L | 10 | 10 | 10 | <10 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | | - | - | - | 2.22 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100 ml | 0 | 0 | - | 0 | ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A, EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çinko | µg/L | - | - | - | 257.7 | EPA 3015 A, EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 9.7 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 49.21 | EPA 3015 A, EPA 200.7 |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| E.coli** | kob/100ml | - | - | - | 62 | İşletme içi metot |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1527.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 62 | TS EN ISO 7899-1 |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C, EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.147 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 102 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 6.98 | SM 5220 B |
| Klorür | mg/L | 250 | 250 | - | 54.90 | SM 4110 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 102 | BAM 2002/ISO 4832 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A, EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A, EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 100.4 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | <10.0 | EPA 3015 A, EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

**Açıklamalar/Remarks:**

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05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A, EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 0.806 | SM 4110 B |
| Nitrat Azotu | mg/L | 3 | - | - | 0.18 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.612 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 191.8 | SM 2580 B |
| Oksitlenebilirlik | mg/L O2 | 5 | 5 | - | <2.80 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 30 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 30 | İşletme içi metot |
| Patojen Stafilokoklar** | kob/100 ml | - | - | - | 300 | İşletme içi metot |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| pH | - | - | - | - | 8.08 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C, EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 4.688 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.16 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.04 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 16.18 | EPA 3015 A, EPA 200.7 |
| Sıcaklık | C° | - | - | - | 6.8 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C,E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 102.0 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 117.8 | EPA 3015 A, EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 497.83 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 590.63 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 25.00 | SM 4500-$S^{2-}$ D |
| Tat* | - | | | - | uygun | İşletme içi metot |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C, EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Azot | mg N/L | 3.5 | - | - | 2.69 | SM 4110 B, SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 1075 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A, EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.06 | CSN 75 7611 , CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.19 | CSN 75 7611 , CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 2.32 | SM 4500-Norg B |
| Toplam Organik Karbon | mg/L | - | - | - | 2.89 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme içi metot |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C, EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C, EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum** | Bq/L | 100 | | - | <10 | CSN EN ISO 9698 |
| Vanadyum | µg/L | - | - | - | 276.7 | EPA 200.7 |
| Vinil Klorür | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | EPA 5030 C, EPA 8260 D |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 7.86 | TS 8312 |

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# DENEY RAPORU / TEST REPORT

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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| LR.23.1141 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1141 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 512566/4527083) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW3 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 216.4 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 59.7 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 555.7 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 129.8 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 9.8 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 154 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 980.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.157 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 88.86 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | <5.00 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 68.86 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 24.75 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 3.93 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.25 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.28 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.04 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 12.86 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 7.5 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 88.9 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 59.67 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 7.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 8.74 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 453 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.07 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.10 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 4.82 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 180.7 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 5.20 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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| LR.23.1142 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1142 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 511857/4528486) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW4 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 206.1 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 57.4 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 552.7 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | 162.8 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 283.9 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 7.3 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 765.4 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1079.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.127 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 108.7 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 8.51 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | 12.98 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 60.08 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 94.55 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 2.15 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.12 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 7.383 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.32 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.04 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 12.87 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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Test
TS EN ISO/IEC 17025
AB-0168-T

AB-0168-T

LR.23.1142

05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 8.4 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 108.7 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 73.24 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 17.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 6.52 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 528 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.072 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.05 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.25 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 4.34 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 162.1 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 3.20 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip Artek ALS Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at Artek ALS Laboratory' which is holding ISO-17025 accreditation.
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| LR.23.1143 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1143 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 517378/4530450) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW5 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 161.7 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 55.4 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 448.0 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 4.04 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 208.2 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 7.3 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 157.8 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 922.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.186 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 61.95 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 12.68 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 63.22 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 42.03 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 1.94 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.29 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.28 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.00 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 9.9 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 62.0 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 49.45 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 3.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 6.32 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 509 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.061 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.07 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.10 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 4.34 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 175.8 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 14.40 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| LR.23.1144 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1144 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 505362/4523973) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-1 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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LR.23.1144

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 5.052 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 78.83 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 105.49 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.360 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 80.13 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 15.08 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 98.00 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 13.59 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 95.99 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 89.11 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| LR.23.1145 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1145 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 513762/4528535) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-2 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 7.562 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 116.71 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 137.49 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.209 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 110.21 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 23.14 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 160.07 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 21.69 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 179.56 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | 28.91 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 118.80 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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| LR.23.1146 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1146 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 508931/4525333) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-13 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.885 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 41.90 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 103.31 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.143 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 92.23 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 20.68 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 133.86 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 13.94 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 128.97 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 65.1 | EN 16166 |
| TPH | mg/kg | 34.65 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 129.67 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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**mail:** encon@enconlab.com.tr **web:** www.enconlaboratory.com

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| LR.23.1147 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1147 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 513238/4526562) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-14 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 4.321 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 51.13 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 126.24 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.161 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 83.52 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 18.85 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 110.16 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 13.20 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 112.64 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 101.33 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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**Açıklamalar/Remarks:**
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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1148 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 511340/4528351) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-15 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.433 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 56.76 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 131.61 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.339 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 89.68 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 19.15 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 114.61 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 13.58 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 113.82 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 458 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 92.89 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1149 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 515214/4529312) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-16 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 29.03.2023 |

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.873 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 55.15 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 79.45 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.201 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 79.23 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 18.71 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 155.28 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 10.14 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 168.76 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 111.91 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 9 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1150 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 528080/4537371) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW8 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C. EPA 8260 D |
| 37 °C'de koloni sayımı** | kob/ml | - | - | - | 41 | TS EN ISO 6222 |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 68 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 106.8 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Anaerob sporlu sülfit redükte eden bakteriler** | kob/50ml | - | - | - | 23 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 41.5 | EPA 200.7 |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C. EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C. EPA 8270 E |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bikarbonat (HCO3) | mg/L | - | - | - | 360.4 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 3.44 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bromat | µg/L | 10 | 10 | 10 | <10 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | | - | - | - | 2.40 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100 ml | 0 | 0 | - | 12 | ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çinko | µg/L | - | - | - | 210.6 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 10.2 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 86.53 | EPA 3015 A. EPA 200.7 |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| E.coli** | kob/100ml | - | - | - | 60 | İşletme içi metot |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 632.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 8 | TS EN ISO 7899-1 |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C. EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.064 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 58.18 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 13.26 | SM 5220 B |
| Klorür | mg/L | 250 | 250 | - | 10.84 | SM 4110 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 310 | BAM 2002/ISO 4832 |
| Krom (Toplam) | µg/L | 50 | - | - | 7.134 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 48.12 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 36.25 | EPA 3015 A. EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 1.73 | SM 4110 B |
| Nitrat Azotu | mg/L | 3 | - | - | 0.39 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.246 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 160.2 | SM 2580 B |
| Oksitlenebilirlik | mg/L O2 | 5 | 5 | - | 3.85 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 53 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 0 | İşletme içi metot |
| Patojen Stafilokoklar** | kob/100 ml | - | - | - | 29 | İşletme içi metot |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| pH | - | - | - | - | 8.65 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C. EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 1.695 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.04 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.00 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 12.74 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 12.6 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C.E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 58.2 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 58.38 | EPA 3015 A. EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 28.47 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 99.04 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | <2.00 | SM 4500-$S^{2-}$ D |
| Tat* | - | | | - | uygun | İşletme içi metot |

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|---|---|---|---|---|---|---|
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Azot | mg N/L | 3.5 | - | - | 2.42 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 380 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.06 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.10 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 1.96 | SM 4500-Norg B |
| Toplam Organik Karbon | mg/L | - | - | - | 5.66 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme içi metot |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C. EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum** | Bq/L | 100 | | - | <10 | CSN EN ISO 9698 |
| Vanadyum | µg/L | - | - | - | 124.9 | EPA 200.7 |
| Vinil Klorür | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | EPA 5030 C. EPA 8260 D |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 1.20 | TS 8312 |

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# DENEY RAPORU / TEST REPORT

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 9 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1151 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 523810/4531271) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW6 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C. EPA 8260 D |
| 37 °C'de koloni sayımı** | kob/ml | - | - | - | 59 | TS EN ISO 6222 |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 190 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 207.2 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Anaerob sporlu sülfit redükte eden bakteriler** | kob/50ml | - | - | - | 28 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.015 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 53.2 | EPA 200.7 |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C. EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C. EPA 8270 E |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bikarbonat (HCO3) | mg/L | - | - | - | 333.1 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bromat | µg/L | 10 | 10 | 10 | <10 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | | - | - | - | 2.72 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100 ml | 0 | 0 | - | 21 | ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çinko | µg/L | - | - | - | 181.4 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 7.7 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 1321 | EPA 3015 A. EPA 200.7 |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| E.coli** | kob/100ml | - | - | - | 50 | İşletme içi metot |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 867.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 38 | TS EN ISO 7899-1 |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C. EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | <0.020 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 69.07 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 6.61 | SM 5220 B |
| Klorür | mg/L | 250 | 250 | - | 21.93 | SM 4110 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 250 | BAM 2002/ISO 4832 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 50.72 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 45.63 | EPA 3015 A. EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 0.797 | SM 4110 B |
| Nitrat Azotu | mg/L | 3 | - | - | 0.18 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.334 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 114.0 | SM 2580 B |
| Oksitlenebilirlik | mg/L O2 | 5 | 5 | - | 2.94 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 61 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 0 | İşletme içi metot |
| Patojen Stafilokoklar** | kob/100 ml | - | - | - | 41 | İşletme içi metot |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

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|---|---|---|---|---|---|---|
| pH | - | - | - | - | 8.55 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C. EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 1.876 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.40 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.24 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.16 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 7.6 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C.E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 69.1 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 75.1 | EPA 3015 A. EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 134.16 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 134.53 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 8.00 | SM 4500-$S^{2-}$ D |
| Tat* | - | | | - | uygun | İşletme içi metot |

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|---|---|---|---|---|---|---|
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Azot | mg N/L | 3.5 | - | - | 1.51 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 630 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.04 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.17 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 1.23 | SM 4500-Norg B |
| Toplam Organik Karbon | mg/L | - | - | - | 3.31 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme içi metot |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C. EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum** | Bq/L | 100 | | - | <10 | CSN EN ISO 9698 |
| Vanadyum | µg/L | - | - | - | 149.1 | EPA 200.7 |
| Vinil Klorür | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | EPA 5030 C. EPA 8260 D |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 1.40 | TS 8312 |

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Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip Ankara Halk Sağlığı Laboratuvarı ve Artek ALS Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at 'Ankara Halk Sagligi Laboratory and Artek ALS Laboratory' which is holding ISO-17025 accreditation**.**
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1152 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 532940/4542986) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-12 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip Artek ALS Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at Artek ALS Laboratory' which is holding ISO-17025 accreditation.
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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 229.8 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.010 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 162.9 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 514.7 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 5.72 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 247.8 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 9.1 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 98.09 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1145.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.165 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 110.5 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 19.54 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | 17.49 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 60.72 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 35.63 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.77 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | 0.039 | SM 4110 B |
| pH | - | - | - | - | 8.50 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.76 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.28 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.12 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 10.85 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 9.9 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 110.5 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 145.28 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 27.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 3.88 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 765 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.072 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.33 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.27 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 3.08 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 166.4 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 9.80 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1153 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 523132/4535008) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-7 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 14.03.2023 / 15.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 15.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 124.8 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 38.9 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 434.9 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 203.6 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 8.9 | SM 4500 O G |
| Debi | Litre/Saniye | - | - | - | 0.002 | EPA 841-B-97-003 |
| Demir (Toplam) | µg/L | 200 | 200 | - | 146.4 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 946.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | <0.020 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 88.12 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 9.87 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 61.1 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 39.1 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.74 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.45 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 9.167 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.40 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.12 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.04 | TS EN ISO 7887 B |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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| 05-23 |

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Selenyum (Toplam) | µg/L | 10 | - | - | 6.858 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 9.8 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 88.1 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 120.13 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 10.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 2.71 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 582 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.101 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.04 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.21 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 1.85 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 160.3 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 8.60 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1154 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 530760/4540919) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-9 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 149.5 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 78.6 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 611.3 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 4.6 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 109.2 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 9.7 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 95.24 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1067.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | <0.020 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 109.4 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 15.32 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 69.19 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 16.41 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 2.66 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.48 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 13.99 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 1.04 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.48 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.28 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 6.188 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 11.7 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 109.4 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 83.89 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | <2.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 4.09 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 655 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.414 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.10 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.36 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 1.34 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 185.9 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 8.80 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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**Tel:** 0 312 447 71 22 **Faks:** 0 312 447 69 88
**mail:** encon@enconlab.com.tr **web:** www.enconlaboratory.com

Test
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AB-0168-T

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| AB-0168-T |
| LR.23.1155 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

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|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1155 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 523398/4530619) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-3 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 29.03.2023 |

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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LR.23.1155

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.455 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 75.74 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 121.89 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.175 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 89.56 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 19.09 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 118.00 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 14.39 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 127.17 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 105.64 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| LR.23.1156 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1156 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 525434/4530921) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-17 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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LR.23.1156

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.967 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 52.88 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 82.46 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.195 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 64.62 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 12.65 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 81.84 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 11.94 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 79.65 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 11.3 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 82.09 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1157 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 527391/4532287) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-18 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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**mail:** encon@enconlab.com.tr **web:** www.enconlaboratory.com

Test
TS EN ISO/IEC 17025
AB-0168-T

AB-0168-T

LR.23.1157

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.309 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 33.45 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 81.31 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.207 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 66.17 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 15.41 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 104.21 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 8.60 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 101.22 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 44.7 | EN 16166 |
| TPH | mg/kg | 25.83 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 98.04 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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Test
TS EN ISO/IEC 17025
AB-0168-T

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|---|
| AB-0168-T |
| LR.23.1158 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1158 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 530798/4540964) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-21 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 15.03.2023 / 16.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 16.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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Test
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|---|
| AB-0168-T |
| LR.23.1158 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.752 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 89.98 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 137.07 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.156 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 82.70 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 16.28 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 99.84 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 10.34 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 95.85 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 101.33 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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AB-0168-T

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| AB-0168-T |
| LR.23.1159 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1159 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 531791/4535988) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-4 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 16.03.2023 / 17.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 17.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | <1.0 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 16.13 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 90.60 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.169 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 42.63 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 9.82 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 34.47 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 9.97 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 24.15 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 116 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 42.35 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip AEM Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at 'AEM Laboratory which is holding ISO-17025 accreditation.
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| LR.23.1160 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1160 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 530060/4535347) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-19 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 16.03.2023 / 17.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 17.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.060 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 15.13 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 50.31 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.128 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 47.28 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 15.90 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 70.76 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 15.65 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 124.95 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 25.1 | EN 16166 |
| TPH | mg/kg | 32.14 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 50.37 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1161 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 533617/4536598) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-22 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 16.03.2023 / 17.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 17.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 1.363 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 12.10 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 60.21 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.107 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 32.94 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 12.30 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 36.49 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 11.06 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 36.16 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | 34.44 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 38.57 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 9 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1162 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 533597/4538708) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-11 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 16.03.2023 / 17.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 17.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C. EPA 8260 D |
| 37 °C'de koloni sayımı** | kob/ml | - | - | - | 109 | TS EN ISO 6222 |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 270 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 366.1 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Anaerob sporlu sülfit redükte eden bakteriler** | kob/50ml | - | - | - | 24 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 70.5 | EPA 200.7 |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C. EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C. EPA 8270 E |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bikarbonat (HCO3) | mg/L | - | - | - | 458.9 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 3.00 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bromat | µg/L | 10 | 10 | 10 | <10 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | | - | - | - | 4.91 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100 ml | 0 | 0 | - | 0 | ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çinko | µg/L | - | - | - | 144.9 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 8.5 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 513.6 | EPA 3015 A. EPA 200.7 |

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| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| E.coli** | kob/100ml | - | - | - | 68 | İşletme içi metot |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1068.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 96 | TS EN ISO 7899-1 |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C. EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.464 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 99.64 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 9.42 | SM 5220 B |
| Klorür | mg/L | 250 | 250 | - | 48.69 | SM 4110 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 368 | BAM 2002/ISO 4832 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 57.44 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 370.4 | EPA 3015 A. EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 7.22 | SM 4110 B |
| Nitrat Azotu | mg/L | 3 | - | - | 1.63 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.325 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 218.1 | SM 2580 B |
| Oksitlenebilirlik | mg/L O2 | 5 | 5 | - | 3.59 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 98 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 4 | İşletme içi metot |
| Patojen Stafilokoklar** | kob/100 ml | - | - | - | 38 | İşletme içi metot |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

**Açıklamalar/Remarks:**

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05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| pH | - | - | - | - | 8.52 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C. EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.28 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.04 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 14.81 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 10.2 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C.E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 99.6 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 105.9 | EPA 3015 A. EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 71.11 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 89.17 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 31.00 | SM 4500-$S^{2-}$ D |
| Tat* | - | | | - | uygun | İşletme içi metot |

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# DENEY RAPORU / TEST REPORT

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|---|---|---|---|---|---|---|
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Azot | mg N/L | 3.5 | - | - | 2.68 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 602 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.11 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.10 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 0.95 | SM 4500-Norg B |
| Toplam Organik Karbon | mg/L | - | - | - | 3.96 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme içi metot |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C. EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum** | Bq/L | 100 | | - | <10 | CSN EN ISO 9698 |
| Vanadyum | µg/L | - | - | - | 146.5 | EPA 200.7 |
| Vinil Klorür | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | EPA 5030 C. EPA 8260 D |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 0.80 | TS 8312 |

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# DENEY RAPORU / TEST REPORT

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0065_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 8 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1163 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 523475/4530155) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yeraltı Suyu / GW-1 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-11 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C, EPA 8260 D |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 700 | TS EN ISO 6222 |
| 37 °C'de koloni sayımı ** | kob/ml | - | - | - | 91 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 264.8 | EPA 3015 A, EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B,F |
| Anaerob sporlu sülfit redükte eden bakteriler** | 0/50ml | - | - | - | 36 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A, EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.008 | EPA 3015 A, EPA 6020 B |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C, EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C, EPA 8270 E |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bikarbonat (HCO3) | mg/L | - | - | - | 420.36 | SM 2340 C |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | EPA 3015 A, TS EN ISO 17294-1/2 |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bromat | µg/L | 10 | 10 | 10 | <10.0 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | NTU | - | - | - | 1.00 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100ml | 0 | 0 | - | 0 | TS EN ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A, EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çözünmüş Oksijen | mg/L | - | - | - | 3.2 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 674.0 | EPA 3015 A, EPA 200.7 |
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| E.coli** | kob/100ml | - | - | - | 2 | SM 9222 H |
| Elektriksel İletkenlik | µS/cm | 2500 | 2500 | - | 4400.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 5 | SM 9230 C |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C, EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | <0.020 | SM 4110 B |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 107.41 | EPA 200.7 |
| Karbonat (CO3) | mg/L | - | - | - | <10.0 | SM 2340 C |
| Klorür | mg/L | 250 | 250 | - | 29.67 | SM 4110 B |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 982 | SM 9222 B |
| Krom (Toplam) | µg/L | 50 | 50 | 50 | 10.38 | EPA 3015 A, EPA 200.7 |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A, EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 66.10 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 22.9 | EPA 3015 A, EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A, EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 46.27 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.274 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 229.8 | SM 2580 B |
| Oksitlenebilirlik | mg/L | 5 | 5 | | <2.80 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 35 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 0 | TS EN ISO 16266 |
| Patojen Stafilokoklar** | kob/100ml | - | - | - | 13 | AFNOR NF T90-412 |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pestisitler | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| pH | - | 6.5 - 9.5 | 6.5 - 9.5 | - | 9.39 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C, EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | m-1 | - | - | - | 0.36 | TS EN ISO 7887 B |
| Renk (525 nm) | m-1 | - | - | - | 0.24 | TS EN ISO 7887 B |
| Renk (620 nm) | m-1 | - | - | - | 0.24 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | 20 | 40 | 11.32 | EPA 3015 A, EPA 200.7 |
| Sıcaklık | C° | | | | 6.4 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C,E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 73.92 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 74.26 | EPA 3015 A,EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 114.57 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 144.95 | SM 4110 B |
| Tat* | - | - | - | - | uygun | işletme içi metot |
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C, EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Çözünmüş Madde | mg/L | - | - | - | 740 | SM 2540 C |
| Toplam Fosfor /Fosfatlar | mg/L | - | - | - | 0.080 | EPA 3015 A, EPA 6020 B |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.04 | CSN 75 7611 , CSN 75 7612 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.05 | CSN 75 7611 , CSN 75 7612 |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Toplam Organik Karbon | mg/L | - | - | - | 1.90 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C, EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C, EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538, 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum | Bq/L | 100 | - | - | <10 | CSN EN ISO 9698 |
| Vinil Klorür* | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | SM 4500-$NH_3$ B,F |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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| LR.23.1164 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0065_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 8 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1164 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 525675/4531774) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yeraltı Suyu / GW-2 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-11 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C. EPA 8260 D |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 120 | TS EN ISO 6222 |
| 37 °C'de koloni sayımı ** | kob/ml | - | - | - | 39 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 161.0 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 0.030 | SM 4500-$NH_3$ B.F |
| Anaerob sporlu sülfit redükte eden bakteriler** | 0/50ml | - | - | - | 21 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.004 | EPA 3015 A. EPA 6020 B |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C. EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C. EPA 8270 E |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bikarbonat (HCO3) | mg/L | - | - | - | 633.07 | SM 2340 C |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | 3.60 | EPA 3015 A. TS EN ISO 17294-1/2 |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bromat | µg/L | 10 | 10 | 10 | <10.0 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | NTU | - | - | - | 22.9 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100ml | 0 | 0 | - | 0 | TS EN ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çözünmüş Oksijen | mg/L | - | - | - | 5.2 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 52.6 | EPA 3015 A. EPA 200.7 |
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| E.coli** | kob/100ml | - | - | - | 0 | SM 9222 H |
| Elektriksel İletkenlik | µS/cm | 2500 | 2500 | - | 1647.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 1 | SM 9230 C |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C. EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.309 | SM 4110 B |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 131.7 | EPA 200.7 |
| Karbonat (CO3) | mg/L | - | - | - | <10.0 | SM 2340 C |
| Klorür | mg/L | 250 | 250 | - | 73.33 | SM 4110 B |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 990 | SM 9222 B |
| Krom (Toplam) | µg/L | 50 | 50 | 50 | 7.051 | EPA 3015 A. EPA 200.7 |

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|---|---|---|---|---|---|---|
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 83.52 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 409.2 | EPA 3015 A. EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

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|---|---|---|---|---|---|---|
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 0.881 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.160 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 228.8 | SM 2580 B |
| Oksitlenebilirlik | mg/L | 5 | 5 | | <2.80 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 62 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 0 | TS EN ISO 16266 |
| Patojen Stafilokoklar** | kob/100ml | - | - | - | 17 | AFNOR NF T90-412 |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pestisitler | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| pH | - | 6.5 - 9.5 | 6.5 - 9.5 | - | 8.01 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C. EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | m-1 | - | - | - | 0.24 | TS EN ISO 7887 B |
| Renk (525 nm) | m-1 | - | - | - | 0.16 | TS EN ISO 7887 B |
| Renk (620 nm) | m-1 | - | - | - | 0.16 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | 20 | 40 | 12.17 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | | | | 13.4 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C.E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 232.4 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 280.3 | EPA 3015 A.EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 230.14 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 281.37 | SM 4110 B |
| Tat* | - | - | - | - | uygun | işletme içi metot |
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Çözünmüş Madde | mg/L | - | - | - | 1029 | SM 2540 C |
| Toplam Fosfor /Fosfatlar | mg/L | - | - | - | <0.06 | EPA 3015 A. EPA 6020 B |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.06 | CSN 75 7611 . CSN 75 7612 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.10 | CSN 75 7611 . CSN 75 7612 |

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|---|---|---|---|---|---|---|
| Toplam Organik Karbon | mg/L | - | - | - | 1.93 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C. EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum | Bq/L | 100 | - | - | <10 | CSN EN ISO 9698 |
| Vinil Klorür* | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | SM 4500-$NH_3$ B.F |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip Ankara Halk Sağlığı Laboratuvarı ve Artek ALS Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at 'Ankara Halk Sagligi Laboratory and Artek ALS Laboratory' which is holding ISO-17025 accreditation.
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1165 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 536134/4543301) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-13 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 16.03.2023 / 17.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 17.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 306.5 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.015 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 27.8 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 239.4 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 170.1 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 7.0 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 1453 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 712.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.168 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 72 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 7.08 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | 7.402 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 55.97 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 32.11 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.35 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.70 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.32 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.16 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.12 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 7.18 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 10.2 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 72.0 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 310.64 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 22.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 1.43 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 415 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.07 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.17 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 1.04 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 144.1 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 0.40 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1166 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 538331/4537420) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-15 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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AB-0168-T

AB-0168-T

LR.23.1166

05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 3005.0 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.034 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 264.3 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 59.0 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 122.4 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 438.9 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 6.1 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 1956 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1500.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 5.966 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 12.59 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 463.72 | SM 5220 B |
| Kobalt | µg/L | - | - | - | 7.323 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | 11.69 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 6.854 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 1093 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.51 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | 7.314 | SM 4110 B |
| pH | - | - | - | - | 8.58 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 13.97 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 18.72 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 7.28 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 3.68 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 13.47 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 6.9 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 12.6 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 33.91 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | <2.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 43.52 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 824 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 16.140 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.39 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 2.47 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 42.84 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 139.3 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 2.80 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| LR.23.1167 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1167 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 563538/4545406) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-19 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 2831.0 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.027 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 155.80 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 406.02 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 9.12 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 291.1 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 7.5 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 2713 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 571.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | <0.020 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 38.48 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 29.41 | SM 5220 B |
| Kobalt | µg/L | - | - | - | 9.18 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | 13.79 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | 18.64 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 11.18 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 813.7 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 1.64 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | 1.052 | SM 4110 B |
| pH | - | - | - | - | 8.47 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 14.23 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 1.84 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.80 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.44 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 11.15 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 7.5 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 103.0 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 30.69 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 32.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 17.66 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 284 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 2.369 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.22 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.73 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 15.85 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 46.38 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 10.60 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip Artek ALS Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at Artek ALS Laboratory' which is holding ISO-17025 accreditation.
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| LR.23.1168 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1168 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 579107/4546593) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-24 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 426.8 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.022 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 118.80 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 1021.51 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 7.12 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | 69.56 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 186 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 6.9 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 123.4 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 2180.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.334 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 123.45 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 22.21 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 76.14 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 20.2 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 11.03 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | 0.886 | SM 4110 B |
| pH | - | - | - | - | 8.25 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 39.83 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 1.28 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.48 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.24 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 11.48 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 8.5 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 386.3 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 233.58 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | <2.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 15.44 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 1372 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 1.769 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 1.18 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.99 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 3.95 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 146.7 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 1.80 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1169 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 562265/4552938) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-20 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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Test
TS EN ISO/IEC 17025
AB-0168-T

AB-0168-T

LR.23.1169

05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 981.6 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 0.055 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | 0.043 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.006 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | <10.0 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 406.83 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 16.56 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 152.5 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 8.5 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 703.5 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 591.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | <0.020 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 24.05 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 49.16 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 48.43 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 81.26 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.11 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.54 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 0.6285 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.40 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.16 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.12 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 14.13 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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05-23

# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 8.2 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 118.6 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 176.97 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 85.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 3.98 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 2380 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.213 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.09 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.10 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 3.78 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 99.49 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 1.40 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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Test
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AB-0168-T

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| AB-0168-T |
| LR.23.1170 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1170 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 530572/4536965) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-20 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 16.03.2023 / 17.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 17.03.2023 / 29.03.2023 |

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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| 03-23 |

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.100 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 9.62 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 68.30 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.145 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 27.64 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 7.41 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 25.37 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 6.98 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 25.96 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | 27.21 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 35.25 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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| LR.23.1171 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1171 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 536875/4538334) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-23 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 16.03.2023 / 17.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 17.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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Test
TS EN ISO/IEC 17025
AB-0168-T

AB-0168-T

LR.23.1171

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | <1.0 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 9.99 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 58.65 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.130 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 25.42 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 9.09 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 26.89 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 7.06 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 36.26 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 20.1 | EN 16166 |
| TPH | mg/kg | 31.42 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 36.88 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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Test
TS EN ISO/IEC 17025
AB-0168-T

| |
|---|
| AB-0168-T |
| LR.23.1172 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1172 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 574386/4548069) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-30 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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Test
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LR.23.1172

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | <1.0 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 3.02 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 17.50 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.135 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 11.54 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 2.54 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 22.06 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 2.94 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 22.53 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 7.45 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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Test
TS EN ISO/IEC 17025
AB-0168-T

| |
|---|
| AB-0168-T |
| LR.23.1173 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1173 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 547755/4539397) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-6 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.721 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 23.49 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 93.83 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.126 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 52.42 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 16.17 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 68.39 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 7.95 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 87.65 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 158 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 76.97 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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Test
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| LR.23.1174 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1174 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 571772/4544774) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-29 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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LR.23.1174

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.878 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 10.82 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 88.60 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | <0.1 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 34.20 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 7.13 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 36.89 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 7.88 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 9.14 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 11.2 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 51.45 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| LR.23.1175 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1175 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 576875/4550041) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-31 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.622 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 14.23 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 167.06 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | <0.1 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 42.54 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 10.46 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 35.17 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 27.71 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 14.92 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | 25.28 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 52.53 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1176 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 549655/4540877) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-25 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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Test
TS EN ISO/IEC 17025
AB-0168-T

AB-0168-T

LR.23.1176

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 2.721 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 22.44 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 102.23 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.109 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 57.69 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 15.21 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 62.63 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 24.27 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 68.45 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 59.4 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 63.28 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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Test
TS EN ISO/IEC 17025
AB-0168-T

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|---|
| AB-0168-T |
| LR.23.1177 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1177 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 543232/4542621) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-24 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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LR.23.1177

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.600 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 18.14 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 169.73 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.337 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 52.42 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 14.81 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 70.29 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 20.43 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 66.94 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | 33.26 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 73.52 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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| LR.23.1178 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1178 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 565641/4545714) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-8 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 6.279 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 41.71 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 276.04 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.322 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 99.31 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 22.71 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 154.64 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 16.69 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 170.91 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 132.15 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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| LR.23.1179 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1179 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 552836/4545877) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-27 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 4.218 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 21.94 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 148.17 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.403 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 90.66 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 10.18 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 42.71 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 10.20 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 51.39 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 34.6 | EN 16166 |
| TPH | mg/kg | 26.59 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 49.19 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1180 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 555566/4544370) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-7 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 1.851 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 27.11 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 120.65 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.384 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 69.14 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 17.55 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 89.11 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 17.08 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 116.68 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 91.11 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1181 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 575249/4546824) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-9 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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| AB-0168-T |
| LR.23.1181 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 1.517 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 14.36 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 104.18 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.335 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 39.97 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 9.16 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 38.27 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 10.60 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 30.47 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 16.4 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 52.80 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| LR.23.1182 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1182 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 553556/4542247) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-26 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 17.03.2023 / 18.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 18.03.2023 / 29.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 17.908 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 21.73 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 66.52 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.334 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 58.65 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 13.80 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 66.59 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 10.05 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 80.18 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 10.1 | EN 16166 |
| TPH | mg/kg | 29.28 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 71.81 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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| LR.23.1202 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 9 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1202 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 626305/4550952) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-29 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 21.03.2023 / 22.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 22.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C. EPA 8260 D |
| 37 °C'de koloni sayımı** | kob/ml | - | - | - | > 300 | TS EN ISO 6222 |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | > 3000 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 299.8 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 0.116 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | 0.090 | SM 4500-$NH_3$ B.F |
| Anaerob sporlu sülfit redükte eden bakteriler** | kob/50ml | - | - | - | 98 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.010 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 67.4 | EPA 200.7 |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C. EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C. EPA 8270 E |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bikarbonat (HCO3) | mg/L | - | - | - | 357.5 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 14.76 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bromat | µg/L | 10 | 10 | 10 | <10 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | | - | - | - | 18.80 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100 ml | 0 | 0 | - | | ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çinko | µg/L | - | - | - | 171.5 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 8.0 | SM 4500 O G |
| Debi | Litre/Saniye | - | - | - | 0.138 | EPA 841-B-97-003 |

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|---|---|---|---|---|---|---|
| Demir (Toplam) | µg/L | 200 | 200 | - | 356.8 | EPA 3015 A. EPA 200.7 |
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| E.coli** | kob/100ml | - | - | - | 870 | İşletme içi metot |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1168.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 300 | TS EN ISO 7899-1 |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C. EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.165 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 |

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| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| | | | | | | 7 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 108.4 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 47.18 | SM 5220 B |
| Klorür | mg/L | 250 | 250 | - | 128.56 | SM 4110 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 1820 | BAM 2002/ISO 4832 |
| Krom (Toplam) | µg/L | 50 | - | - | 5.823 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 34.25 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 127.8 | EPA 3015 A. EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 |

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|---|---|---|---|---|---|---|
| | | | | | | 7 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 12.82 | SM 4110 B |
| Nitrat Azotu | mg/L | 3 | - | - | 2.89 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.277 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 253.7 | SM 2580 B |
| Oksitlenebilirlik | mg/L O2 | 5 | 5 | - | 11.21 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | 0.333 | SM 4110 B |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 30 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 10 | İşletme içi metot |
| Patojen Stafilokoklar** | kob/100 ml | - | - | - | 400 | İşletme içi metot |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 |

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|---|---|---|---|---|---|---|
| | | | | | | 7 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| pH | - | - | - | - | 8.28 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C. EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 10.79 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 1.08 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.36 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.16 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 6.744 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 11.8 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C.E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 108.4 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 116.2 | EPA 3015 A. EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 81.08 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 103.66 | SM 4110 B |

**Açıklamalar/Remarks:**

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05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Sülfür** | µg/L | 2 | - | - | <2.00 | SM 4500-$S^{2-}$ D |
| Tat* | - | | | - | uygun | İşletme içi metot |
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Azot | mg N/L | 3.5 | - | - | 7.09 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 853 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 1.223 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.07 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.29 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 4.12 | SM 4500-Norg B |
| Toplam Organik Karbon | mg/L | - | - | - | 13.78 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme içi metot |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C. EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum** | Bq/L | 100 | | - | <10 | CSN EN ISO 9698 |
| Vanadyum | µg/L | - | - | - | 88.1 | EPA 200.7 |
| Vinil Klorür | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | EPA 5030 C. EPA 8260 D |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 3.80 | TS 8312 |

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Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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| LR.23.1203 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 9 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1203 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 570845/4544970) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-21 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 21.03.2023 / 22.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Açık |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 22.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C. EPA 8260 D |
| 37 °C'de koloni sayımı** | kob/ml | - | - | - | > 300 | TS EN ISO 6222 |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 510 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 845.7 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 0.157 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | 0.122 | SM 4500-$NH_3$ B.F |
| Anaerob sporlu sülfit redükte eden bakteriler** | kob/50ml | - | - | - | 93 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.008 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 94.5 | EPA 200.7 |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C. EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C. EPA 8270 E |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bikarbonat (HCO3) | mg/L | - | - | - | <10.00 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 26.32 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bromat | µg/L | 10 | 10 | 10 | <10 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | | - | - | - | 140.00 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100 ml | 0 | 0 | - | | ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çinko | µg/L | - | - | - | 294.3 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 9.8 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 1095 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| E.coli** | kob/100ml | - | - | - | 0 | İşletme içi metot |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 213.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 115 | TS EN ISO 7899-1 |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C. EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.050 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

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|---|---|---|---|---|---|---|
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 12.4 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 102.29 | SM 5220 B |
| Klorür | mg/L | 250 | 250 | - | 22.90 | SM 4110 B |
| Kobalt | µg/L | - | - | - | 5.912 | EPA 200.7 |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 96 | BAM 2002/ISO 4832 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 4.663 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 805.4 | EPA 3015 A. EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

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|---|---|---|---|---|---|---|
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 0.905 | SM 4110 B |
| Nitrat Azotu | mg/L | 3 | - | - | 0.20 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | <0.066 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 330.3 | SM 2580 B |
| Oksitlenebilirlik | mg/L O2 | 5 | 5 | - | 12.85 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 130 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 2230 | İşletme içi metot |
| Patojen Stafilokoklar** | kob/100 ml | - | - | - | 135 | İşletme içi metot |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| pH | - | - | - | - | 9.23 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C. EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 9.592 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.64 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.28 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.12 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 10.47 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 9.1 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C.E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 12.4 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 14.77 | EPA 3015 A. EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 40.49 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 45.20 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 17.00 | SM 4500-$S^{2-}$ D |
| Tat* | - | | | - | uygun | İşletme içi metot |

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AB-0168-T

AB-0168-T

LR.23.1203

05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Azot | mg N/L | 3.5 | - | - | 2.31 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 216 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.116 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.04 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.32 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 2.10 | SM 4500-Norg B |
| Toplam Organik Karbon | mg/L | - | - | - | 12.16 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme içi metot |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C. EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum** | Bq/L | 100 | | - | <10 | CSN EN ISO 9698 |
| Vanadyum | µg/L | - | - | - | 18.48 | EPA 200.7 |
| Vinil Klorür | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | EPA 5030 C. EPA 8260 D |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 1.40 | TS 8312 |

**Açıklamalar/Remarks:**

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| 05-23 |

# DENEY RAPORU / TEST REPORT

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

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| LR.23.1204 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0065_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 8 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1204 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 531052/4536535) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yeraltı Suyu / GW-3 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-11 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 21.03.2023 / 22.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 22.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| 1.2-dikloretan | µg/L | 3 | 3 | 30 | <0.2 | EPA 5030 C. EPA 8260 D |
| 2.4 Acid | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 2.4.5-T | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| 22 °C'de Koloni Sayımı** | kob/ml | - | - | - | 33 | TS EN ISO 6222 |
| 37 °C'de koloni sayımı ** | kob/ml | - | - | - | 13 | TS EN ISO 6222 |
| Aclonifen | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Akrilamid* | µg/L | 0.1 | 0.1 | 0.5 | <0.025 | işletme içi metot |
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 97.78 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 0.076 | SM 4500-$NH_3$ B.F |
| Anaerob sporlu sülfit redükte eden bakteriler** | 0/50ml | - | - | - | 0 | TS 8020 EN 26461-2 |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Atrazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.030 | EPA 3015 A. EPA 6020 B |
| Bentazone | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Benzen | µg/L | 1 | 1 | 10 | <0.2 | EPA 5030 C. EPA 8260 D |
| Benzo (a) piren | µg/L | 0.01 | 0.01 | 0.7 | <0.01 | EPA 3510 C. EPA 8270 E |
| Bifenox | µg/L | 0.1 | 0.1 | - | <5 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bikarbonat (HCO3) | mg/L | - | - | - | 326.84 | SM 2340 C |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | EPA 3015 A. TS EN ISO 17294-1/2 |
| Boscalid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Bromat | µg/L | 10 | 10 | 10 | <10.0 | SM 4110 D |
| Bromoxynl | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Bulanıklık | NTU | - | - | - | 1.39 | SM 2130 B |
| C. perfringens (Sporlular dahil)** | kob/100ml | 0 | 0 | - | 0 | TS EN ISO 14189 |
| Carbaryl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbendazim | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Carbofuran | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Chlorfenvinphos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Clothianidin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Cybutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Çözünmüş Oksijen | mg/L | - | - | - | 6.9 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 129.1 | EPA 3015 A. EPA 200.7 |
| Dichlorvos | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Dimethoate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Diuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| E.coli** | kob/100ml | - | - | - | 0 | SM 9222 H |
| Elektriksel İletkenlik | µS/cm | 2500 | 2500 | - | 720.0 | SM 2510 B |
| Enterokok** | kob/100ml | - | - | - | 0 | SM 9230 C |
| Epikloridin* | µg/L | 0.1 | 0.1 | 0.4 | <0.1 | EPA 5030 C. EPA 8260 D |
| Ethoprophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| ETU | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenarimol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Fenthion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.157 | SM 4110 B |
| Hexythiazox | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imazalil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Imidachloprid | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Isoproturon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 54.5 | EPA 200.7 |
| Karbonat (CO3) | mg/L | - | - | - | <10.0 | SM 2340 C |
| Klorür | mg/L | 250 | 250 | - | 20.84 | SM 4110 B |
| Koku* | TON | - | - | - | 1 | işletme içi metot |
| Koliform Bakteri** | kob/100ml | - | - | - | 25 | SM 9222 B |
| Krom (Toplam) | µg/L | 50 | 50 | 50 | <5.0 | EPA 3015 A. EPA 200.7 |

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| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Linuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 41.21 | EPA 200.7 |
| Malathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 17.8 | EPA 3015 A. EPA 200.7 |
| MCA | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metalaxyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methidathion | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methomyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Methoxyfenozide | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Metolachlor | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Molinate | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Monocrotophos | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Myclobutanil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat | mg/L | 50 | 50 | 50 | 0.498 | SM 4110 B |
| Nitrit | mg/L | 0.5 | 0.5 | 3 | 0.124 | SM 4110 B |
| Oksidasyon Redüksiyon (Redoks) Potansiyeli (ORP) | mV | - | - | - | 282.7 | SM 2580 B |
| Oksitlenebilirlik | mg/L | 5 | 5 | | <2.80 | TS 6288 EN ISO 8467 |
| Omethoate | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadiazon | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Oxadixil | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| P. Aeruginosa** | kob/100ml | - | - | - | 0 | TS EN ISO 16266 |
| Parazitler** | adet/5 L | - | - | - | 83 | TS EN ISO 16266 |
| Patojen Stafilokoklar** | kob/100ml | - | - | - | 0 | AFNOR NF T90-412 |
| Pendimethalin | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pestisitler | µg/L | 0.1 | 0.1 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| pH | - | 6.5 - 9.5 | 6.5 - 9.5 | - | 8.30 | SM 4500-$H^+$ B |
| Piperonyl butoxide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Pirimicarb | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Polisiklik Aromatik Hidrokarbonlar | µg/L | 0.1 | 0.1 | - | <0.01 | EPA 3510 C. EPA 8270 E |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Propazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |

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|---|---|---|---|---|---|---|
| Propiconazole | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Propyzamide | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Quinoxyfen | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Renk (436 nm) | m-1 | - | - | - | 0.12 | TS EN ISO 7887 B |
| Renk (525 nm) | m-1 | - | - | - | 0.12 | TS EN ISO 7887 B |
| Renk (620 nm) | m-1 | - | - | - | 0.12 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | 20 | 40 | 11.71 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | | | | 13.9 | SM 2550 B |
| Simazine | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Siyanür | µg/L | 50 | 50 | - | <10.00 | SM 4500-CN C.E |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 48.64 | EPA 200.7 |
| Sodyum (Toplam) | mg/L | 200 | 200 | - | 59.69 | EPA 3015 A.EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 29.26 | SM 4110 B |
| Sülfat (Toplam) | mg/L | 250 | 250 | - | 35.62 | SM 4110 B |
| Tat* | - | - | - | - | uygun | işletme içi metot |
| Terbutryn | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tetrakloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Thiophonate Methyl | µg/L | 0.1 | 0.1 | - | <50 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Toplam Çözünmüş Madde | mg/L | - | - | - | 446 | SM 2540 C |
| Toplam Fosfor /Fosfatlar | mg/L | - | - | - | <0.06 | EPA 3015 A. EPA 6020 B |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.04 | CSN 75 7611 . CSN 75 7612 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <0.10 | CSN 75 7611 . CSN 75 7612 |

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|---|---|---|---|---|---|---|
| Toplam Organik Karbon | mg/L | - | - | - | 2.25 | TS 8195 EN 1484 |
| Toplam Pestisitler | µg/L | 0.5 | 0.5 | - | <0.1 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triadimenol | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Tribenuron-methyl | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Triclosan | µg/L | 0.1 | 0.1 | - | <10 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trihalometanlar-toplam | µg/L | 100 | 100 | - | <0.2 | EPA 5030 C. EPA 8260 D |
| Trikloreten | µg/L | 10 | 10 | 100. 8 | <0.2 | EPA 5030 C. EPA 8260 D |
| Tritosulfuron | µg/L | 0.1 | 0.1 | - | <0.05 | İşletme İçi Metot-ENC.LABTL.LCP.176-Rev01/28.09.2017 (EPA 538. 5990-4253 EN Agilent Application Notes' dan uyarlanmıştır.) |
| Trityum | Bq/L | 100 | - | - | <10 | CSN EN ISO 9698 |
| Vinil Klorür* | µg/L | 0.5 | 0.5 | 0.3 | <0.2 | SM 4500-$NH_3$ B.F |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip Ankara Halk Sağlığı Laboratuvarı ve Artek ALS Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at 'Ankara Halk Sagligi Laboratory and Artek ALS Laboratory' which is holding ISO-17025 accreditation.
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1205 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 604641/4575040) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-30 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 111.4 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 0.287 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | 0.223 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 24.8 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 207.1 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 167.6 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 9.4 | SM 4500 O G |
| Demir (Toplam) | µg/L | 200 | 200 | - | 35.29 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 464.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.027 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 76.95 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 8.80 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 2.063 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | <10.0 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 26.96 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.73 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.00 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.00 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |
| Selenyum (Toplam) | µg/L | 10 | - | - | 94.47 | EPA 3015 A. EPA 200.7 |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Sıcaklık | C° | - | - | - | 7.3 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 4.7 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 28.88 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 6.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 28.46 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 378 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.20 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.11 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 1.46 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | <10.0 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 1.80 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1206 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 594541/4549457) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-28 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 18.04.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 72.2 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | <0.026 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | <0.020 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | <5.0 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | <0.001 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 93.2 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 440.4 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | <3.0 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | <1.0 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 131 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 8.4 | SM 4500 O G |
| Debi | Litre/Saniye | - | - | - | 0.027 | EPA 841-B-97-003 |
| Demir (Toplam) | µg/L | 200 | 200 | - | 40.43 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 925.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 0.114 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 65.73 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 8.52 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | 8.785 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 24.04 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 11.48 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.09 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.33 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | <0.5 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.04 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.00 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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Test
TS EN ISO/IEC 17025
AB-0168-T

AB-0168-T

LR.23.1206

05-23

# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Selenyum (Toplam) | µg/L | 10 | - | - | 18.76 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 8.4 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 98.4 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 53.66 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 2.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 1.52 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 586 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | <0.06 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.11 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | <.10 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 1.29 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 57.82 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 2.20 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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Test
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AB-0168-T

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| AB-0168-T |
| LR.23.1207 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1207 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 582192/4543770) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-25 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 18.03.2023 / 19.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 19.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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LR.23.1207

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 461.8 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 0.360 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | 0.280 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | 14.76 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.016 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 95.5 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 649.4 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 31.6 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | 198.5 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 114.4 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 2.3 | SM 4500 O G |
| Debi | Litre/Saniye | - | - | - | 0.024 | EPA 841-B-97-003 |
| Demir (Toplam) | µg/L | 200 | 200 | - | 425.8 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1576.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 3.549 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 68.94 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 101.89 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | 9.443 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 24.48 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 326.2 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.12 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | 0.129 | SM 4110 B |
| pH | - | - | - | - | 8.13 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 10.5 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.84 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.32 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.12 | TS EN ISO 7887 B |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Selenyum (Toplam) | µg/L | 10 | - | - | 10.31 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 9.9 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 295.4 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 101.47 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 753.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 9.06 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 903 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.368 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.16 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.26 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 8.68 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 57.33 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 2.00 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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**-(**) işaretli parametreler ISO 17025 Akreditasyonuna sahip Artek ALS Laboratuvarı tarafından yapılmıştır. /** (**) Parameters with "**" are conducted at Artek ALS Laboratory' which is holding ISO-17025 accreditation.
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| LR.23.1208 |
| 05-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 03.05.2023 / 3 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1208 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 582435/4547203) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Yüzey Suyu / SW-26 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | Anlık |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS ISO 5667-6 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 18.03.2023 / 19.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz, Plastik, Cam |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | Kapalı |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 19.03.2023 / 18.04.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **03.05.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**03.05.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| Parametre<br>Parameter | Birim<br>Unit | İTASHY Raporlama Limiti | EU Raporlama Limiti | WHO Raporlama Limiti | Analiz Sonucu<br>Test Result | Analiz Metodu<br>Method of Analysis |
|---|---|---|---|---|---|---|
| Alüminyum (Toplam) | µg/L | 200 | 200 | - | 1012.0 | EPA 3015 A. EPA 200.7 |
| Amonyum | mg/L | 0.5 | 0.5 | - | 2.746 | SM 4500-$NH_3$ B.F |
| Amonyum Azotu | mg/L | 0.2 | - | - | 2.136 | SM 4500-$NH_3$ B.F |
| Antimon | µg/L | 5 | 10 | 20 | 15.21 | EPA 200.7 |
| Arsenik (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Bakır (Toplam) | mg/L | 2 | 2 | 2 | 0.034 | EPA 3015 A. EPA 6020 B |
| Baryum | µg/L | - | - | - | 128.7 | EPA 200.7 |
| Berilyum | µg/L | - | - | - | <1.0 | EPA 200.7 |
| Bikarbonat (HCO3) | mg/L | - | - | - | 356.7 | SM 2340 C |
| Biyokimyasal Oksijen İhtiyacı | mg/L | 4 | - | - | 60.32 | SM 5210 B |
| Bor (Toplam) | mg/L | 1 | 1.5 | 2.4 | 139.2 | TS EN ISO 15587-1-2. TS EN ISO 17294-1/2. |
| Civa (Toplam) | µg/L | 1 | 1 | 6 | <1.0 | EPA 3015 A. EPA 200.7 |
| Çinko | µg/L | - | - | - | 210.9 | EPA 3015 A. EPA 200.7 |
| Çözünmüş Oksijen | mg/L | 6 | - | - | 3.5 | SM 4500 O G |
| Debi | Litre/Saniye | - | - | - | 0.027 | EPA 841-B-97-003 |
| Demir (Toplam) | µg/L | 200 | 200 | - | 576.1 | EPA 3015 A. EPA 200.7 |
| Elektriksel İletkenlik | µS/cm | 400 | - | - | 1541.0 | SM 2510 B |
| Florür | mg/L | 1.5 | 1.5 | 1.5 | 4.70 | SM 4110 B |
| Gümüş | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Kadmiyum | µg/L | 5 | 5 | 3 | <0.5 | EPA 6020 B |
| Kalsiyum (Çözünmüş) | mg/L | - | - | - | 25.65 | EPA 200.7 |
| Karbonat | mg/L | - | - | - | <10.0 | SM 2340 C |
| Kimyasal Oksijen İhtiyacı | mg/L | 25 | - | - | 224.63 | SM 5220 B |
| Kobalt | µg/L | - | - | - | <5.0 | EPA 200.7 |
| Krom (Toplam) | µg/L | 50 | - | - | 17.87 | EPA 3015 A. EPA 200.7 |
| Kurşun (Toplam) | µg/L | 10 | 10 | 10 | <10.0 | EPA 3015 A. EPA 200.7 |
| Magnezyum (Çözünmüş) | mg/L | - | - | - | 26.26 | EPA 200.7 |
| Mangan (Toplam) | µg/L | 50 | 50 | 80 | 250.3 | EPA 3015 A. EPA 200.7 |
| Nikel (Toplam) | µg/L | 20 | 20 | 70 | <5.0 | EPA 3015 A. EPA 200.7 |
| Nitrat Azotu | mg/L | 3 | - | - | 0.09 | SM 4110 B |
| Orto Fosfat Fosforu | mg/L | 0.05 | - | - | <0.020 | SM 4110 B |
| pH | - | - | - | - | 8.17 | SM 4500-$H^+$ B |
| Potasyum (Çözünmüş) | mg/L | - | - | - | 16.11 | EPA 200.7 |
| Renk (436 nm) | $m^{-1}$ | 1.5 | - | - | 0.72 | TS EN ISO 7887 B |
| Renk (525 nm) | $m^{-1}$ | 1.2 | - | - | 0.16 | TS EN ISO 7887 B |
| Renk (620 nm) | $m^{-1}$ | 0.8 | - | - | 0.00 | TS EN ISO 7887 B |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre** Parameter | **Birim** Unit | **İTASHY Raporlama Limiti** | **EU Raporlama Limiti** | **WHO Raporlama Limiti** | **Analiz Sonucu** Test Result | **Analiz Metodu** Method of Analysis |
|---|---|---|---|---|---|---|
| Selenyum (Toplam) | µg/L | 10 | - | - | <5.0 | EPA 3015 A. EPA 200.7 |
| Sıcaklık | C° | - | - | - | 13.0 | SM 2550 B |
| Sodyum (Çözünmüş) | mg/L | - | - | - | 153.5 | EPA 200.7 |
| Sülfat (Çözünmüş) | mg/L | - | - | - | 72.73 | SM 4110 B |
| Sülfür** | µg/L | 2 | - | - | 492.00 | SM 4500-$S^{2-}$ D |
| Toplam Azot | mg N/L | 3.5 | - | - | 10.89 | SM 4110 B. SM 4500-Norg B |
| Toplam Çözünmüş Madde | mg/L | | - | - | 904 | SM 2540 C |
| Toplam Fosfor | mg/L | 0.08 | - | - | 0.482 | EPA 3015 A. EPA 200.7 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.14 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Gösterge Dozu (alfa aktivite)** | mSv/yıl | 0.1 | - | - | 0.55 | CSN 75 7611 . CSN 75 7612; Recommendation of SUJB 2012 |
| Toplam Kjeldahl Azotu | mg/L | 0.5 | - | - | 10.44 | SM 4500-Norg B |
| Vanadyum | µg/L | - | - | - | 61.76 | EPA 200.7 |
| Yağ ve Gres** | mg/L | 0.2 | - | - | 4.60 | TS 8312 |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1209 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 594533/4551335) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-34 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 30.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 6.196 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 20.55 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 135.26 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 4.173 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 69.11 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 11.45 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 50.63 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 8.95 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 69.10 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 15.0 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 59.67 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
**-Bu rapor ve sonuçları ENCON Laboratuvarı A.Ş.' nin izni olmadan ticari ve reklam amaçlı tamamen veya kısmen çoğaltılamaz veya yayınlanamaz.** / This report and results given in this report cannot be reproduced for commercial or advertising purposes without prior consent of ENCON Laboratory Inc..
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| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1210 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 592824/4550148) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-11 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 30.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

**Türk Akreditasyon Kurumu (TÜRKAK) deney raporlarının tanınırlığı konusunda Avrupa Akreditasyon Birliği (EA) ile Çok Taraflı Anlaşma ve Uluslararası laboratuvar Akreditasyon Birliği (ILAC) ile karşılıklı tanıma anlaşması imzalamıştır.** Turkish Accreditation Agency (TURKAK) is a signatory to the European co-operation for Accreditation (EA) Multilateral Agreement (MLA) and to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the recognition of test reports.

**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 10.163 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 20.47 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 214.73 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.396 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 57.74 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 15.77 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 78.73 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 8.40 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 20.13 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 24.0 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 73.27 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1211 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 597542/4551369) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-12 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 30.03.2023 |

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 6.347 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 31.16 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 97.29 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.442 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 80.74 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 19.57 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 92.32 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 12.30 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 139.85 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 16.0 | EN 16166 |
| TPH | mg/kg | 29.75 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 94.43 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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# DENEY RAPORU / TEST REPORT

| | |
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| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1212 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 588679/4553951) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-33 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 30.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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| LR.23.1212 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 6.477 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 18.62 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 235.10 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.427 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 58.74 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 13.81 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 63.17 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 12.17 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 38.84 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 16.0 | EN 16166 |
| TPH | mg/kg | 32.79 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 94.31 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
Laboratuvar yetkili personel tarafından alınmayan ve/veya uygun koşullarda teslim alınmayan numunelerden teknik ve hukuki olarak sorumluluk kabul etmemektedir. Müşteri tarafından sağlanan bilgilerin hukuki sorumluluğu müşteriye aittir. firmamız bu bilgilerden kaynaklanacak sonuçlardan feragat eder.
Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**
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| LR.23.1213 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1213 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 584550/4547736) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-10 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 19.03.2023 / 20.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 20.03.2023 / 30.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 4.436 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 23.88 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 109.57 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.577 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 58.63 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 21.59 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 83.35 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 14.76 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 110.17 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 25.0 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 75.91 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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# DENEY RAPORU / TEST REPORT

| | |
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| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1214 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 583212/4545138) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-32 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 18.03.2023 / 19.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 19.03.2023 / 30.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.260 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 24.60 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 110.76 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.518 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 64.80 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 16.34 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 78.99 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 10.68 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 71.55 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 84.20 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
For the samples not taken by the ENCON laboratory Inc.. uncertainty values indicated do not cover the uncertainties arising from the sampling.
The Laboratory does not accept technical and legal responsibility for samples that are not sampled by authorized personnel and/or received under inappropriate conditions. The legal responsibility of the information provided by the customer belongs to the customer. our company waives the consequences arising from this information.

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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## ENCON LABORATUVARI A.Ş.

Reşit Galip Caddesi No: 120 Gaziosmanpaşa Çankaya /ANKARA
**Tel:** 0 312 447 71 22 **Faks:** 0 312 447 69 88
**mail:** encon@enconlab.com.tr **web:** www.enconlaboratory.com


Test
TS EN ISO/IEC 17025
AB-0168-T

| |
|---|
| AB-0168-T |
| LR.23.1215 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1215 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 569430/4545925) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-28 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 18.03.2023 / 19.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 19.03.2023 / 30.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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**Deney ve /veya ölçüm sonuçları, genişletilmiş ölçüm belirsizlikleri (olması halinde) ve deney metotları bu sertifikanın tamamlayıcı kısmı olan takip eden sayfalarda verilmiştir.** The test and/or measurement results, the uncertainties (if applicable) with confidence probability and test methods are given on the following pages which are part of this report.

| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

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**-Rapordaki analiz sonuçları laboratuvara teslim edilen, deneyi yapılan numuneye aittir.** / Results given in this report represents the results of the analyses of the samples received.
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LR.23.1215

03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 1.488 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 7.85 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 98.76 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.275 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 24.17 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 8.84 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 22.91 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 13.01 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | <0.5 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | <10 | EN 16166 |
| TPH | mg/kg | <25.0 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 31.96 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
ENCON Laboratuvarı A.Ş. tarafından alınmayan numuneler için belirtilen ölçüm belirsizliği değerlerine numune almadan kaynaklanan belirsizlik değerleri dahil edilmemektedir.
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Water Samples are sampled according to the standards of TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. whereas wastewater. sea water. sludge. solid. soil and sediment samples are sampled according to the standard of TS ISO 5667-10. TS ISO 5667-9. TS EN ISO 5667-13. TS 12090. TS 9923 and TS ISO 5667-12. respectively.
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**mail:** encon@enconlab.com.tr **web:** www.enconlaboratory.com

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| AB-0168-T |
| LR.23.1216 |
| 03-23 |

# DENEY RAPORU / TEST REPORT

| | |
|---|---|
| **Müşteri Adı / Adresi**<br>Client Name / Address | Çanakkale Otoyol ve Köprüsü İnşaat Yatırım ve İşletme A.Ş. / Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, ÇANAKKALE |
| ***Teklif Numarası***<br>*Proposal Number* | LT23_0040_Rev01 |
| **Rapor Tarihi / Sayfa Sayısı**<br>Report Date / Number of Pages | 30.03.2023 / 2 |
| **Numune Kayıt No**<br>Sample Record Number | NUM.23.1216 |
| **Numuneyi Alan Kurum / Kuruluş**<br>Sampler Institution / Company | ENCON Laboratuvarı A.Ş. |
| **Numune Alınan Yer**<br>Sampling Location | ÇOK A.Ş. KM Section (Koordinat No: 538517/4541523) |
| **Numune Türü / Numune İşareti**<br>Sample Type / Sample Sign | Toprak / S-5 |
| **Numunenin Alınış Şekli *ve Amacı***<br>*Way and Aim the Sampling* | -- |
| **Numuneyi Alan**<br>Person Conducted Sampling | Serhad İNCEDERE |
| ***Numune Alma Standardı***<br>*Sampling Standard* | TS 9923 |
| **Numune Alma / Kabul Tarihi**<br>Sampling Date / Date of Samples Received | 20.03.2023 / 21.03.2023 |
| **Numunenin Teslim Koşulları**<br>Delivery Conditions of the Sample | Mühürsüz , Plastik |
| **Numune Alımında Çevre Şartları**<br>Environmental Conditions During Sampling | -- |
| **Açıklamalar**<br>Remarks | Müşteri talebi üzerine özel istek numunesi olarak çalışılmıştır. Bu rapor çevre mevzuatına ilişkin resmi işlemlerde kullanılamaz. |
| **Deneyin Yapıldığı Tarih**<br>Date of Test | 21.03.2023 / 30.03.2023 |

**Deney laboratuvarı olarak faaliyet gösteren ENCON Laboratuvarı A.Ş. TÜRKAK' tan AB-0168-T ile TS EN ISO/IEC 17025 standardına gore akredite edilmiştir**. ENCON Laboratuvarı A.Ş. is accredited by TÜRKAK under registration number AB-0168-T for TS EN ISO/IEC 17025 as a test laboratory.

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| **Yayımlandığı Tarih**<br>**Date** | **Raporu Hazırlayan**<br>Person in charge of report<br>Dildar SÜSLÜ<br>Laboratuvar Sorumlusu | **Onaylayan/ Approval**<br>**Tarih**/ Date<br>Hüseyin TEKİN<br>Laboratuvar Müdürü |
|---|---|---|
| **30.03.2023** | **e-imza ile imzalanmıştır** | **e-imza ile imzalanmıştır**<br>**30.03.2023** |

**Açıklamalar/Remarks:**

**-İmzasız Deney Raporları geçersizdir.** / Reports without signature are not valid.
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03-23

# DENEY RAPORU / TEST REPORT

| **Parametre**<br>Parameter | **Birim**<br>Unit | **Analiz Sonucu**<br>Test Result | **Analiz Metodu**<br>Method of Analysis |
|---|---|---|---|
| Arsenik | mg/kg | 3.205 | EPA 3051 A. EPA 6010 D |
| Bakır | mg/kg | 28.76 | EPA 3051 A. EPA 6010 D |
| Baryum | mg/kg | 97.77 | EPA 3051 A. EPA 6010 D |
| BTEX | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Civa | mg/kg | 0.353 | EPA 3051 A. EPA 6010 D |
| Çinko | mg/kg | 70.19 | EPA 3051 A. EPA 6010 D |
| Kadmiyum | mg/kg | <0.4 | EPA 3051 A. EPA 6010 D |
| Kobalt | mg/kg | 15.65 | EPA 3051 A. EPA 6010 D |
| Krom | mg/kg | 74.75 | EPA 3051 A. EPA 6010 D |
| Kurşun | mg/kg | 9.35 | EPA 3051 A. EPA 6010 D |
| Nikel | mg/kg | 77.35 | EPA 3051 A. EPA 6010 D |
| TOX** | mg/kg | 69.0 | EN 16166 |
| TPH | mg/kg | 28.55 | TS ISO 14507. TS EN 14039 |
| TVOCs | mg/kg | <0.25 | EPA 5021 A. EPA 8260 D |
| Vanadyum | mg/kg | 83.38 | EPA 3051 A. EPA 6010 D |

Su numunesi TS EN ISO 5667-6. TS ISO 5667-4. TS ISO 5667-11. atıksu numunesi TS ISO 5667-10. deniz suyu numunesi TS ISO 5667-9. çamur numunesi TS EN ISO 5667-13. katı atık numunesi TS 12090. toprak numunesi TS 9923 ve sediment numunesi TS ISO 5667-12 standartlarına gore alınmaktadır.
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# CERTIFICATE OF ANALYSIS

| | | | |
|---|---|---|---|
| **Work Order** | : **PR2331245** | Issue Date | : 20-Apr-2023 |
| **Amendment** | : **1** | | |
| Customer | : **ARTEK MUHENDISLIK CEVRE OLCUM VE DANISMANLIK HIZM. TIC. A.S.** | Laboratory | : ALS Czech Republic, s.r.o. |
| Contact | : Selen Oksuz | Contact | : Client Service |
| Address | : Mehmet Akif Mah. Elalmis Cad. Tagrik Bugra Sok. No: 15 34 775 Umraniye/Istanbul Turkey | Address | : Na Harfe 336/9 Prague 9 - Vysocany 190 00 Czech Republic |
| E-mail | : selen.oksuz@ALSGlobal.com | E-mail | : customer.support@alsglobal.com |
| Telephone | : ---- | Telephone | : +420 226 226 228 |
| Project | : Encon Laboratuvarı A.Ş. | Page | : 1 of 4 |
| Order number | : ARTEK-BQ | Date Samples Received | : 28-Mar-2023 |
| | | Quote number | : PR2017ALSTR-TR0002 (TR-252-17-0383) |
| Site | : YENİPAZAR/YOZGAT | Date of test | : 28-Mar-2023 - 18-Apr-2023 |
| Sampled by | : customer | QC Level | : ALS CR Standard Quality Control Schedule |

## *General Comments*

This report shall not be reproduced except in full, without prior written approval from the laboratory.
The laboratory declares that the test results relate only to the listed samples. If the section "Sampled by" of the Certificate of analysis states: "Sampled by Customer" then the results relate to the sample as received.
Amendmemt 1: W-TRI-SCIH added for samples 001-015, client request. This Amendment 1 replaces the original report issued on 13.4.2023.
Method W-TID-CC: A conservative estimate of TID from GAA and GBA was performed using contributions of Po-210 resp. Ra-228.
Sample(s) PR2331245/008, method W-GAA-SCI: The sample(s) was turbid (coloured), efficiency of gross alpha activity measurement was low, therefore reported limit of detection was higher.
Sample(s) PR2331245/024, method W-GAA-SCI: The sample(s) was turbid (coloured), efficiency of gross alpha activity measurement was low, therefore reported limit of detection was higher.

## *Responsible for accuracy*

**Testing Laboratory No. 1163**
**Accredited by CAI according to**
**CSN EN ISO/IEC 17025:2018**

| *Signatories* | *Position* |
|---|---|
| Lubomír Pokorný | Country Manager |












The company is certified according to ČSN EN ISO 14001 (Environmental management systems) and ČSN ISO 45001 (Occupational health and safety management systems)

## *Analytical Results*

Sub-Matrix: **WATER**

| | | | | Client sample ID | NUM23-1141 (SW-3) | | NUM23-1142 (SW-4) | | NUM23-1143 (SW-5) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | PR2331245001 | | PR2331245002 | | PR2331245003 | |
| | | | | Client sampling date / time | 15-Mar-2023 | | 15-Mar-2023 | | 15-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | **0.07** | ± 32.1% | **0.05** | ± 44.0% | **0.07** | ± 36.6% |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | <0.10 | ---- | **0.25** | ± 20.1% | **0.10** | ± 36.0% |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | <0.10 | ---- | <0.10 | ---- | <0.10 | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | **0.07** | ---- | **0.06** | ---- | **0.07** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | <10 | ---- | <10 | ---- | <10 | ---- |
| **Total Metals / Major Cations** | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | **2.36** | ± 15.0% | **7.41** | ± 15.0% | **2.82** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | **0.0748** | ± 15.0% | **0.234** | ± 15.0% | **0.0894** | ± 15.0% |

Sub-Matrix: **WATER**

| | | | | Client sample ID | NUM23-1152 (SW-12) | | NUM23-1153 (SW-7) | | NUM23-1154 (SW-9) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | PR2331245004 | | PR2331245005 | | PR2331245006 | |
| | | | | Client sampling date / time | 15-Mar-2023 | | 15-Mar-2023 | | 15-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | **0.33** | ± 23.8% | <0.04 | ---- | **0.10** | ± 32.2% |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | **0.27** | ± 19.4% | **0.21** | ± 21.7% | **0.36** | ± 17.6% |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | **0.21** | ---- | <0.10 | ---- | <0.10 | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | **0.40** | ---- | <0.03 | ---- | **0.10** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | <10 | ---- | <10 | ---- | <10 | ---- |
| **Total Metals / Major Cations** | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | **2.11** | ± 15.0% | **8.19** | ± 15.0% | **11.8** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | **0.0668** | ± 15.0% | **0.259** | ± 15.0% | **0.375** | ± 15.0% |

Sub-Matrix: **WATER**

| | | | | Client sample ID | NUM23-1165 (SW-13) | | NUM23-1166 (SW-15) | | NUM23-1167 (SW-19) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | PR2331245007 | | PR2331245008 | | PR2331245009 | |
| | | | | Client sampling date / time | 16-Mar-2023 | | 17-Mar-2023 | | 17-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | **0.07** | ± 30.1% | <0.39 | ---- | **0.22** | ± 44.4% |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | **0.17** | ± 24.8% | **2.47** | ± 15.1% | **0.73** | ± 15.7% |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | **0.10** | ---- | <0.10 | ---- | **0.44** | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | **0.11** | ---- | **0.17** | ---- | **0.41** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | <10 | ---- | <10 | ---- | <10 | ---- |
| **Total Metals / Major Cations** | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | **2.38** | ± 15.0% | **103** | ± 15.0% | **10.3** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | **0.0752** | ± 15.0% | **3.26** | ± 15.0% | **0.325** | ± 15.0% |

Sub-Matrix: **WATER**

| | | | | Client sample ID | NUM23-1168 (SW-24) | | NUM23-1169 (SW-20) | | NUM23-1205 (SW-30) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | PR2331245010 | | PR2331245011 | | PR2331245012 | |
| | | | | Client sampling date / time | 17-Mar-2023 | | 19-Mar-2023 | | 19-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | **1.18** | ± 15.0% | **0.09** | ± 27.9% | **0.20** | ± 20.4% |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | **0.99** | ± 15.4% | **0.10** | ± 35.7% | **0.11** | ± 34.8% |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | **0.27** | ---- | <0.10 | ---- | <0.10 | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | **1.17** | ---- | **0.08** | ---- | **0.21** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | <10 | ---- | <10 | ---- | <10 | ---- |

| Sub-Matrix: **WATER** | | | | Client sample ID | **NUM23-1168 (SW-24)** | | **NUM23-1169 (SW-20)** | | **NUM23-1205 (SW-30)** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | *PR2331245010* | | *PR2331245011* | | *PR2331245012* | |
| | | | | Client sampling date / time | 17-Mar-2023 | | 19-Mar-2023 | | 19-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Total Metals / Major Cations** | | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | | **25.3** | ± 15.0% | **4.24** | ± 15.0% | **1.22** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | | **0.801** | ± 15.0% | **0.134** | ± 15.0% | **0.0385** | ± 15.0% |

| Sub-Matrix: **WATER** | | | | Client sample ID | **NUM23-1206 (SW-28)** | | **NUM23-1207 (SW-25)** | | **NUM23-1208 (SW-26)** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | *PR2331245013* | | *PR2331245014* | | *PR2331245015* | |
| | | | | Client sampling date / time | 18-Mar-2023 | | 18-Mar-2023 | | 17-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | | **0.11** | ± 28.1% | **0.16** | ± 44.3% | **0.14** | ± 35.6% |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | | <0.10 | ---- | **0.26** | ± 19.7% | **0.55** | ± 16.2% |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | | <0.10 | ---- | <0.10 | ---- | **0.15** | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | | **0.10** | ---- | **0.14** | ---- | **0.19** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | | <10 | ---- | <10 | ---- | <10 | ---- |
| **Total Metals / Major Cations** | | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | | **2.81** | ± 15.0% | **11.0** | ± 15.0% | **14.4** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | | **0.0890** | ± 15.0% | **0.347** | ± 15.0% | **0.456** | ± 15.0% |

| Sub-Matrix: **WATER** | | | | Client sample ID | **NUM23-1140 (SW-1)** | | **NUM23-1164 (GW-2)** | | **NUM23-1202 (SW-29)** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | *PR2331245016* | | *PR2331245017* | | *PR2331245018* | |
| | | | | Client sampling date / time | 15-Mar-2023 | | 19-Mar-2023 | | 21-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | | **0.06** | ± 68.4% | **0.06** | ± 50.0% | **0.07** | ± 59.8% |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | | **0.19** | ± 22.9% | <0.10 | ---- | **0.29** | ± 18.8% |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | | <0.10 | ---- | <0.10 | ---- | <0.10 | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | | **0.06** | ---- | **0.07** | ---- | **0.06** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | | <10 | ---- | <10 | ---- | <10 | ---- |
| **Total Metals / Major Cations** | | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | | **6.48** | ± 15.0% | **1.22** | ± 15.0% | **10.8** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | | **0.205** | ± 15.0% | **0.0387** | ± 15.0% | **0.340** | ± 15.0% |

| Sub-Matrix: **WATER** | | | | Client sample ID | **NUM23-1203 (SW-21)** | | **NUM23-1204 (GW-3)** | | **NUM23-1150 (SW-8)** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Laboratory sample ID | *PR2331245019* | | *PR2331245020* | | *PR2331245021* | |
| | | | | Client sampling date / time | 21-Mar-2023 | | 21-Mar-2023 | | 15-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | | <0.04 | ---- | <0.04 | ---- | **0.06** | ± 34.7% |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | | **0.32** | ± 18.2% | <0.10 | ---- | **0.10** | ± 35.7% |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | | <0.10 | ---- | <0.10 | ---- | <0.10 | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | | **0.03** | ---- | <0.03 | ---- | **0.05** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | | <10 | ---- | <10 | ---- | <10 | ---- |
| **Total Metals / Major Cations** | | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | | **10.2** | ± 15.0% | **1.99** | ± 15.0% | **3.70** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | | **0.323** | ± 15.0% | **0.0631** | ± 15.0% | **0.117** | ± 15.0% |

| Sub-Matrix: **WATER** | Client sample ID | **NUM23-1151 (SW-6)** | **NUM23-1162 (SW-11)** | **NUM23-1163 (GW-1)** |
|---|---|---|---|---|
| | Laboratory sample ID | *PR2331245022* | *PR2331245023* | *PR2331245024* |

| Sub-Matrix: **WATER** | | | Client sample ID | **NUM23-1151 (SW-6)** | | **NUM23-1162 (SW-11)** | | **NUM23-1163 (GW-1)** | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Laboratory sample ID | *PR2331245022* | | *PR2331245023* | | *PR2331245024* | |
| | | | Client sampling date / time | 15-Mar-2023 | | 16-Mar-2023 | | 19-Mar-2023 | |
| *Parameter* | *Method* | *LOR* | *Unit* | **Result** | **MU** | **Result** | **MU** | **Result** | **MU** |
| **Radiological Parameters** | | | | | | | | | |
| **Gross alpha activity** | W-GAA-SCI | 0.04 | Bq/L | <0.04 | ---- | **0.11** | ± 34.0% | <0.05 | ---- |
| **Gross beta activity** | W-GBA-PRO | 0.10 | Bq/L | **0.17** | ± 24.4% | <0.10 | ---- | <0.10 | ---- |
| **Gross beta activity - 40K** | W-GBAC-CC | 0.10 | Bq/L | <0.10 | ---- | <0.10 | ---- | <0.10 | ---- |
| **Total indicative dose** | W-TID-CC | 0.03 | mSv/yr | **0.03** | ---- | **0.11** | ---- | **0.04** | ---- |
| **Tritium** | W-TRI-SCIH | 10 | Bq/L | <10 | ---- | <10 | ---- | <10 | ---- |
| **Total Metals / Major Cations** | | | | | | | | | |
| **Potassium** | W-K40-AASF | 0.02 | mg/L | **4.84** | ± 15.0% | **1.77** | ± 15.0% | **1.37** | ± 15.0% |
| **Potassium 40** | W-K40-AASF | 0.00060 | Bq/L | **0.153** | ± 15.0% | **0.0561** | ± 15.0% | **0.0433** | ± 15.0% |

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes. Measurement uncertainty is expressed as expanded measurement uncertainty with coverage factor k = 2, representing 95% confidence level.
Key: LOR = Limit of reporting; MU = Measurement Uncertainty. The MU does not include sampling uncertainty.

***The end of result part of the certificate of analysis***

## Brief Method Summaries

| *Analytical Methods* | *Method Descriptions* |
|---|---|
| *Location of test performance: Bendlova 1687/7 Ceska Lipa Czech Republic 470 01* | |
| W-GAA-SCI | CSN 75 7611 chapter 4 Determination of gross alpha activity by measuring of evaporated residue in a mixture with ZnS (Ag) scintillator. |
| W-GBAC-CC | CZ_SOP_D06_07_361 (CSN 75 7612, CSN EN ISO 9697, SUJB Recommendation "Measurement and assessment of the content of natural radionuclides in drinking water from public sources and bottled water" DR-RO-5.1 (Rev. 0.0), Prague 2017). Determination of gross beta activity by measuring of evaporated residue by means of proportional detector and calculation of gross beta activity corrected for potassium 40 from measured values. CZ_SOP_D06_07_005 (CSN ISO 8288, CSN 75 7400, CSN EN 1233, CSN EN 16192, CSN ISO 7980, CSN ISO 9964, Perkin-Elmer specifications, samples prepared as per CZ_SOP_D06_07_P02 chap. 10, 13, 17) Determination of elements49) by flame AAS method and stoichiometric calculations of compounds concentration from measured values. |
| W-GBA-PRO | CZ_SOP_D06_07_361 (CSN 75 7612, CSN EN ISO 9697, SUJB Recommendation "Measurement and assessment of the content of natural radionuclides in drinking water from public sources and bottled water" DR-RO-5.1 (Rev. 0.0), Prague 2017). Determination of gross beta activity by measuring of evaporated residue by means of proportional detector and calculation of gross beta activity corrected for potassium 40 from measured values. |
| W-K40-AASF | CZ_SOP_D06_07_005 (CSN ISO 8288, CSN 75 7400, CSN EN 1233, CSN ISO 7980, CSN ISO 9964, Perkin-Elmer specifications) Determination of elements by flame AAS method and stoichiometric calculations of compounds concentration from measured values. |
| W-TID-CC | CZ_SOP_D06_07_372 (SUJB Recommendation "Measurement and assessment of the content of natural radionuclides in drinking water from public sources and bottled water", DR-RO-5.1 (Rev.0.0), Prague 2017, Council Directive 2013/51/EUROATOM of 22.10.2013). Calculation of Indicative Dose (ID) from the measured values of volume activities of individual radionuclides. The conservative estimate of ID is calculated on the base of Ra-228 in the case of beta ray and Po-210 in the case of alpha ray. |
| W-TRI-SCIH | CZ_SOP_D06_07_365 (CSN EN ISO 9698) Determination of tritium volume activity by liquid scintillation counting method (LSC). |

The symbol "*" for the method indicates a test outside the scope of accreditation of the laboratory or subcontractor. If the UNICO-SUB code is stated in the method table, this only informs that the tests have been performed by a subcontractor and the results are given in an annex to the test report, including information on test accreditation. If the lab used for matrix outside the scope of accreditation or non-standard sample matrix procedure specified in the accredited method and issues non-accredited results, this fact is stated on the title page of this protocol in the section "Notes". If the test report shows the results of subcontracting, the place of performance of the test is outside the laboratories of ALS Czech Republic, s.r.o.
The method for calculating of the summation parameters is available on request in the customer service.



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**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix D - Flora Fauna Species List*

Submitted to:

**ÇOK A.Ş.**

1915 Çanakkale Ana Kontrol Merkezi G azi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, Çanakkalel

Submitted by:

**WSP Danışmanlık ve Mühendislik Ltd. Şti.**

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22519766-final draft

March 2025



**APPENDIX D**

# Flora Fauna Species List

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**TABLES**

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Table 2: Fauna species list....4

**Table 1: Flora species list**

| Species | Global IUCN status | National IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| *Acer campestre* | LC | - | - | O |
| *Ailanthus altissima* | NE | - | - | O |
| *Alisma plantago-aquatica* | LC | - | - | L |
| *Amblyopyrum muticum* | EN | - | - | L |
| *Anthemis tinctoria* | NE | - | - | O |
| *Avena sterilis* | LC | - | - | O |
| *Baldellia ranunculoides* | NT | - | - | L |
| *Bolboschoenus maritimus* | LC | - | - | L |
| *Callitriche brutia* | LC | - | - | L |
| *Cardopatium corymbosum* | NE | - | - | O |
| *Carpinus betulus* | LC | - | - | O |
| *Centaurea iberica* | NE | - | - | O |
| *Chrysopogon gryllus subsp. gryllus* | NE | - | - | O |
| *Cirsium baytopae* | NE | EN | Regional Endemic | O |
| *Cornus mas* | LC | - | - | O |
| *Cornus sanguinea subsp. australis* | NE | - | - | O |
| *Corylus avellana* | LC | - | - | O |
| *Dactylis glomerata* | NE | - | - | O |
| *Digitalis lanata* | NE | - | - | O |
| *Elatine alsinastrum* | NT | - | - | L |
| *Equisetum arvense* | LC | - | - | L |
| *Eryngium campestre* | NE | - | - | O |
| *Eryngium creticum* | NE | - | - | O |
| *Festuca valesiaca* | NE | - | - | O |
| *Fraxinus excelsior* | NT | - | - | L |
| *Fraxinus ornus subsp. ornus* | LC | - | - | O |
| *Heracleum sphondylium subsp. ternatum* | NE | - | - | O |
| *Hordeum murinum* | LC | - | - | O |
| *Juglans regia* | LC | - | - | O |
| *Juncus articulatus* | LC | - | - | L |
| *Juncus bufonius* | LC | - | - | L |
| *Juncus effusus* | LC | - | - | L |
| *Juniperus oxycedrus* | LC | - | - | O |
| *Lemna minor* | LC | - | - | L |
| *Lolium perenne* | NE | - | - | O |
| *Malus sylvestris* | DD | - | - | O |
| *Medicago papillosa* | NT | - | - | L |
| *Medicago rigidula* | LC | - | - | L |
| *Medicago sativa* | LC | - | - | L |
| *Myriophyllum spicatum* | LC | - | - | L |
| *Ostrya carpinifolia* | LC | - | - | O |

| Species | Global IUCN status | National IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| *Paliurus spina-christi* | NE | - | - | O |
| *Phragmites australis* | LC | - | - | O |
| *Pinus nigra* | LC | - | - | O |
| *Pinus pinea* | LC | - | - | O |
| *Populus alba* | LC | - | - | O |
| *Populus canadensis* | NE | - | - | O |
| *Potamogeton natans* | LC | - | - | L |
| *Potamogeton nodosus* | LC | - | - | L |
| *Potamogeton pusillus* | LC | - | - | L |
| *Prunus padus* | LC | - | - | L |
| *Prunus spinosa* | LC | - | - | L |
| *Psilurus incurvus* | NE | - | - | O |
| *Quercus cerris subsp. cerris* | LC | - | - | O |
| *Quercus petraea subsp. iberica* | NE | - | - | O |
| *Quercus pubescens* | LC | - | - | O |
| *Robinia pseudoacacia* | LC | - | - | O |
| *Rubus sanctus* | NE | - | - | O |
| *Salix alba* | LC | - | - | O |
| *Schoenoplectus tabernaemontani* | LC | - | - | L |
| *Sideritis scardica* | NT | - | - | L |
| *Spirodela polyrhiza* | LC | - | - | L |
| *Stuckenia pectinata* | LC | - | - | L |
| *Tilia argentea* | LC | - | - | O |
| *Trachynia distachya* | NE | - | - | O |
| *Trapa natans* | LC | - | - | L |
| *Typha angustifolia* | LC | - | - | L |
| *Typha domingensis* | LC | - | - | L |
| *Ulmus minor* | DD | - | - | O |
| *Zannichellia palustris* | LC | - | - | L |

**Table 2: Fauna species list**

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| Fish | *Abramis brama* | LC | - | L |
| | *Acipenser gueldenstaedtii* | CR | - | L |
| | *Acipenser stellatus* | CR | - | L |
| | *Alburnoides bipunctatus* | NE | - | O 2023 |
| | *Alburnus alburnus* | LC | - | O 2022-2023 |
| | *Alburnus istanbulensis* | LC | - | L |
| | *Alosa fallax* | LC | - | L |
| | *Alosa maeotica* | LC | - | L |
| | *Alosa pontica* | LC | - | L |
| | *Anguilla anguilla* | CR | - | L |
| | *Atherina boyeri* | LC | - | L |
| | *Babka gymnotrachelus* | LC | - | L |
| | *Barbus cyclolepis* | LC | - | L |
| | *Blicca bjoerkna* | LC | - | L |
| | *Carassius gibelio* | NE | - | O 2023 |
| | *Chelon ramada* | LC | - | L |
| | *Chondrostoma vardarense* | NT | - | L |
| | *Clupeonella cultriventris* | LC | - | L |
| | *Cobitis pontica* | LC | - | L |
| | *Cobitis strumicae* | LC | - | O 2022 |
| | *Cyprinus carpio* | Alien | - | L |
| | *Dicentrarchus labrax* | LC | - | L |
| | *Gambusia holbrooki* | Alien | - | O 2022-2023 |
| | *Gasterosteus aculeatus* | LC | - | L |
| | *Gasterosteus gymnurus* | LC | - | L |
| | *Gobio bulgaricus* | LC | - | O 2022 |
| | *Gobius paganellus* | LC | - | L |
| | *Knipowitschia caucasica* | LC | - | L |
| | *Leucaspius delineatus* | LC | - | L |
| | *Leuciscus aspius* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Mesogobius batrachocephalus* | LC | - | L |
| | *Morone saxatilis* | Alien | - | L |
| | *Neogobius fluviatilis* | LC | - | L |
| | *Petroleuciscus borysthenicus* | LC | - | O 2022 |
| | *Pomatoschistus marmoratus* | LC | - | L |
| | *Pomatoschistus minutus* | LC | - | L |
| | *Proterorhinus semilunaris* | LC | - | L |
| | *Rhodeus amarus* | LC | - | L |
| | *Rutilus rutilus* | LC | - | L |
| | *Sabanejewia balcanica* | LC | - | L |
| | *Salaria fluviatilis* | LC | - | L |
| | *Salmo labrax* | LC | - | L |
| | *Salmo trutta* | Alien | - | L |
| | *Sander lucioperca* | LC | - | L |
| | *Scardinius erythrophthalmus* | LC | - | L |
| | *Silurus glanis* | LC | - | L |
| | *Squalius orpheus* | LC | - | O 2023 |
| | *Syngnathus abaster* | LC | - | L |
| | *Vimba melanops* | DD | - | L |
| | *Vimba vimba* | LC | - | L |
| Amphibian | *Bombina bombina* | LC | - | L |
| | *Bufo bufo* | LC | - | O 2022 |
| | *Bufotes viridis* | LC | - | L |
| | *Hyla orientalis* | LC | - | L |
| | *Lissotriton vulgaris* | LC | - | L |
| | *Pelobates syriacus* | LC | - | L |
| | *Pelophylax ridibundus* | LC | - | L |
| | *Rana dalmatina* | LC | - | L |
| | *Triturus karelinii* | LC | - | L |
| Reptile | *Ablepharus kitaibelii* | LC | - | L |
| | *Coronella austriaca* | LC | - | L |
| | *Dolichophis caspius* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Elaphe sauromates* | LC | - | L |
| | *Emys orbicularis* | NT | - | L |
| | *Eryx jaculus* | LC | - | L |
| | *Hemidactylus turcicus* | LC | - | L |
| | *Hemorrhois ravergieri* | LC | - | L |
| | *Lacerta trilineata* | LC | - | L |
| | *Lacerta viridis* | LC | - | O 2022 |
| | *Malpolon insignitus* | LC | - | L |
| | *Mauremys rivulata* | LC | - | O 2022 |
| | *Mediodactylus kotschyi* | LC | - | L |
| | *Natrix natrix* | LC | - | L |
| | *Natrix tessellata* | LC | - | L |
| | *Ophisops elegans* | LC | - | O 2022 |
| | *Platyceps collaris* | LC | - | L |
| | *Platyceps najadum* | LC | - | L |
| | *Podarcis muralis* | LC | - | L |
| | *Podarcis siculus* | Alien | - | L |
| | *Podarcis tauricus* | LC | - | L |
| | *Pseudopus apodus* | LC | - | L |
| | *Telescopus fallax* | LC | - | L |
| | *Testudo graeca* | VU | - | O 2022 |
| | *Testudo hermanni* | NT | - | O 2022 |
| | *Vipera ammodytes* | LC | - | L |
| | *Xerotyphlops vermicularis* | LC | - | L |
| | *Zamenis longissimus* | LC | - | L |
| | *Zamenis situla* | LC | - | L |
| Bird | *Accipiter brevipes* | LC | - | L |
| | *Accipiter gentilis* | LC | - | L |
| | *Accipiter nisus* | LC | - | O 2022 |
| | *Acrocephalus arundinaceus* | LC | - | L |
| | *Acrocephalus melanopogon* | LC | - | L |
| | *Acrocephalus palustris* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Acrocephalus scirpaceus* | LC | - | L |
| | *Aegithalos caudatus* | LC | - | L |
| | *Alauda arvensis* | LC | - | O 2022 |
| | *Alcedo atthis* | LC | - | L |
| | *Alectoris chukar* | LC | - | L |
| | *Alexandrinus krameri* | Alien | - | L |
| | *Anthropoides virgo* | LC | - | L |
| | *Anthus campestris* | LC | - | L |
| | *Anthus pratensis* | LC | - | O 2022 |
| | *Anthus spinoletta* | LC | - | L |
| | *Anthus trivialis* | LC | - | L |
| | *Apus apus* | LC | - | L |
| | *Aquila chrysaetos* | LC | - | L |
| | *Aquila heliaca* | VU | - | L |
| | *Aquila nipalensis* | EN | - | L |
| | *Ardea alba* | LC | - | L |
| | *Ardea cinerea* | LC | - | L |
| | *Ardea purpurea* | LC | - | L |
| | *Asio otus* | LC | - | L |
| | *Athene noctua* | LC | - | L |
| | *Botaurus stellaris* | LC | - | L |
| | *Bubo bubo* | LC | - | L |
| | *Burhinus oedicnemus* | LC | - | L |
| | *Buteo buteo* | LC | - | O 2022 |
| | *Buteo lagopus* | LC | - | L |
| | *Buteo rufinus* | LC | - | L |
| | *Calandrella brachydactyla* | LC | - | L |
| | *Calidris alpina* | LC | - | L |
| | *Caprimulgus europaeus* | LC | - | L |
| | *Carduelis carduelis* | LC | - | O 2022 |
| | *Carduelis chloris* | LC | - | O 2022 |
| | *Cecropis daurica* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Cercotrichas galactotes* | LC | - | L |
| | *Certhia brachydactyla* | LC | - | L |
| | *Cettia cetti* | LC | - | L |
| | *Charadrius alexandrinus* | LC | - | L |
| | *Charadrius dubius* | LC | - | L |
| | *Chloris chloris* | LC | - | L |
| | *Ciconia ciconia* | LC | - | O 2022 |
| | *Ciconia nigra* | LC | - | L |
| | *Circaetus gallicus* | LC | - | L |
| | *Circus aeruginosus* | LC | - | L |
| | *Circus cyaneus* | LC | - | L |
| | *Circus macrourus* | NT | - | L |
| | *Circus pygargus* | LC | - | L |
| | *Clamator glandarius* | LC | - | L |
| | *Clanga clanga* | VU | - | L |
| | *Clanga pomarina* | LC | - | L |
| | *Coccothraustes coccothraustes* | LC | - | L |
| | *Columba livia* | LC | - | L |
| | *Columba oenas* | LC | - | L |
| | *Columba palumbus* | LC | - | L |
| | *Coracias garrulus* | LC | - | L |
| | *Corvus corax* | LC | - | L |
| | *Corvus corone* | LC | - | L |
| | *Corvus frugilegus* | LC | - | L |
| | *Corvus monedula* | LC | - | L |
| | *Coturnix coturnix* | LC | - | L |
| | *Cuculus canorus* | LC | - | L |
| | *Curruca cantillans* | LC | - | L |
| | *Curruca communis* | LC | - | L |
| | *Curruca crassirostris* | LC | - | L |
| | *Curruca curruca* | LC | - | L |
| | *Curruca melanocephala* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Curruca nisoria* | LC | - | L |
| | *Curruca ruppeli* | LC | - | L |
| | *Cyanecula svecica* | LC | - | L |
| | *Cyanistes caeruleus* | LC | - | L |
| | *Delichon urbicum* | LC | - | O 2022 |
| | *Dendrocopos leucotos* | LC | - | L |
| | *Dendrocopos medius* | LC | - | L |
| | *Dendrocopos syriacus* | LC | - | L |
| | *Dryobates minor* | LC | - | L |
| | *Emberiza caesia* | LC | - | L |
| | *Emberiza calandra* | LC | - | O 2022 |
| | *Emberiza cia* | LC | - | L |
| | *Emberiza cirlus* | LC | - | L |
| | *Emberiza citrinella* | LC | - | L |
| | *Emberiza hortulana* | LC | - | L |
| | *Emberiza melanocephala* | LC | - | L |
| | *Emberiza schoeniclus* | LC | - | L |
| | *Erithacus rubecula* | LC | - | L |
| | *Falco cherrug* | EN | - | L |
| | *Falco columbarius* | LC | - | L |
| | *Falco eleonorae* | LC | - | L |
| | *Falco naumanni* | LC | - | L |
| | *Falco peregrinus* | LC | - | L |
| | *Falco subbuteo* | LC | - | L |
| | *Falco tinnunculus* | LC | - | O 2022 |
| | *Falco vespertinus* | VU | - | L |
| | *Ficedula albicollis* | LC | - | L |
| | *Ficedula parva* | LC | - | L |
| | *Ficedula semitorquata* | LC | - | L |
| | *Fringilla coelebs* | LC | - | L |
| | *Fringilla montifringilla* | LC | - | L |
| | *Galerida cristata* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Gallinago gallinago* | LC | - | L |
| | *Gallinago media* | NT | - | L |
| | *Garrulus glandarius* | LC | - | O 2022 |
| | *Glareola pratincola* | LC | - | L |
| | *Gyps fulvus* | LC | - | L |
| | *Haematopus ostralegus* | NT | - | L |
| | *Haliaeetus albicilla* | LC | - | L |
| | *Hieraaetus pennatus* | LC | - | L |
| | *Himantopus himantopus* | LC | - | L |
| | *Hippolais olivetorum* | LC | - | L |
| | *Hirundo rustica* | LC | - | O 2022 |
| | *Iduna pallida* | LC | - | L |
| | *Lanius collurio* | LC | - | L |
| | *Lanius excubitor* | LC | - | L |
| | *Lanius minor* | LC | - | L |
| | *Lanius nubicus* | LC | - | L |
| | *Lanius senator* | NT | - | L |
| | *Larus canus* | LC | - | L |
| | *Larus michahellis* | LC | - | L |
| | *Leiopicus medius* | LC | - | L |
| | *Limosa limosa* | NT | - | L |
| | *Linaria cannabina* | LC | - | L |
| | *Locustella fluviatilis* | LC | - | L |
| | *Locustella luscinioides* | LC | - | L |
| | *Lullula arborea* | LC | - | L |
| | *Luscinia megarhynchos* | LC | - | L |
| | *Melanocorypha calandra* | LC | - | L |
| | *Merops apiaster* | LC | - | O 2022 |
| | *Milvus migrans* | LC | - | L |
| | *Milvus milvus* | LC | - | L |
| | *Monticola saxatilis* | LC | - | L |
| | *Motacilla alba* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Motacilla cinerea* | LC | - | L |
| | *Motacilla flava* | LC | - | L |
| | *Muscicapa striata* | LC | - | L |
| | *Neophron percnopterus* | EN | - | L |
| | *Numenius arquata* | NT | - | L |
| | *Nycticorax nycticorax* | LC | - | L |
| | *Oenanthe hispanica* | LC | - | L |
| | *Oenanthe isabellina* | LC | - | L |
| | *Oenanthe oenanthe* | LC | - | O 2022 |
| | *Oriolus oriolus* | LC | - | L |
| | *Otus scops* | LC | - | L |
| | *Pandion haliaetus* | LC | - | L |
| | *Panurus biarmicus* | LC | - | L |
| | *Parus major* | LC | - | L |
| | *Passer domesticus* | LC | - | O 2022 |
| | *Passer hispaniolensis* | LC | - | O 2022 |
| | *Passer montanus* | LC | - | L |
| | *Pelecanus crispus* | NT | - | L |
| | *Pernis apivorus* | LC | - | L |
| | *Phasianus colchicus* | Alien | - | L |
| | *Phoenicurus ochruros* | LC | - | L |
| | *Phoenicurus phoenicurus* | LC | - | L |
| | *Phylloscopus collybita* | LC | - | L |
| | *Phylloscopus orientalis* | LC | - | L |
| | *Phylloscopus trochilus* | LC | - | L |
| | *Pica pica* | LC | - | O 2022 |
| | *Picus canus* | LC | - | L |
| | *Picus viridis* | LC | - | L |
| | *Poecile lugubris* | LC | - | L |
| | *Poecile palustris* | LC | - | L |
| | *Prunella modularis* | LC | - | L |
| | *Ptyonoprogne rupestris* | LC | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Pyrrhula pyrrhula* | LC | - | L |
| | *Recurvirostra avosetta* | LC | - | L |
| | *Regulus ignicapilla* | LC | - | L |
| | *Regulus regulus* | LC | - | L |
| | *Remiz pendulinus* | LC | - | L |
| | *Riparia riparia* | LC | - | L |
| | *Saxicola torquatus* | LC | - | L |
| | *Scolopax rusticola* | LC | - | L |
| | *Serinus serinus* | LC | - | L |
| | *Sitta europaea* | LC | - | L |
| | *Spilopelia senegalensis* | LC | - | L |
| | *Spinus spinus* | LC | - | L |
| | *Streptopelia decaocto* | LC | - | O 2022 |
| | *Streptopelia turtur* | VU | - | L |
| | *Strix aluco* | LC | - | L |
| | *Sturnus vulgaris* | LC | - | O 2022 |
| | *Sylvia atricapilla* | LC | - | L |
| | *Sylvia borin* | LC | - | L |
| | *Sylvia nisoria* | LC | - | L |
| | *Tachymarptis melba* | LC | - | L |
| | *Tringa totanus* | LC | - | L |
| | *Troglodytes troglodytes* | LC | - | L |
| | *Turdus iliacus* | NT | - | L |
| | *Turdus merula* | LC | - | L |
| | *Turdus philomelos* | LC | - | L |
| | *Turdus pilaris* | LC | - | L |
| | *Turdus torquatus* | LC | - | L |
| | *Turdus viscivorus* | LC | - | L |
| | *Tyto alba* | LC | - | L |
| | *Upupa epops* | LC | - | O 2022 |
| | *Vanellus spinosus* | LC | - | L |
| | *Vanellus vanellus* | NT | - | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| Mammal | *Apodemus flavicollis* | LC | | O 2022 |
| | *Apodemus sylvaticus* | LC | | L |
| | *Arvicola amphibius* | LC | | L |
| | *Barbastella barbastellus* | NT | | L |
| | *Canis aureus* | LC | | O 2022 |
| | *Canis lupus* | LC | | L |
| | *Capreolus capreolus* | LC | | L |
| | *Cricetulus migratorius* | LC | | L |
| | *Crocidura leucodon* | LC | | L |
| | *Crocidura suaveolens* | LC | | L |
| | *Dryomys nitedula* | LC | | L |
| | *Eptesicus serotinus* | LC | | L |
| | *Erinaceus roumanicus* | LC | | O 2022 |
| | *Felis silvestris* | LC | | L |
| | *Glis glis* | LC | | L |
| | *Lepus europaeus* | LC | | O 2022 |
| | *Lutra lutra* | NT | | L |
| | *Martes foina* | LC | | L |
| | *Martes martes* | LC | | L |
| | *Meles meles* | LC | | L |
| | *Micromys minutus* | LC | | L |
| | *Microtus guentheri* | LC | | O 2022 |
| | *Microtus levis* | LC | | L |
| | *Microtus subterraneus* | LC | | L |
| | *Miniopterus schreibersii* | VU | | L |
| | *Mus macedonicus* | LC | | L |
| | *Mus musculus* | LC | | L |
| | *Mustela nivalis* | LC | | L |
| | *Myomimus roachi* | VU | | L |
| | *Myotis aurascens* | LC | | L |
| | *Myotis bechsteinii* | NT | | L |
| | *Myotis blythii* | LC | | L |

| Taxon | Species | Global IUCN status | End./RR. | Lit./Obs. |
|---|---|---|---|---|
| | *Myotis capaccinii* | VU | | L |
| | *Myotis daubentonii* | LC | | L |
| | *Myotis emarginatus* | LC | | L |
| | *Myotis myotis* | LC | | L |
| | *Myotis mystacinus* | LC | | L |
| | *Nannospalax leucodon* | DD | | O 2022 |
| | *Neomys anomalus* | LC | | L |
| | *Nyctalus noctula* | LC | | L |
| | *Pipistrellus kuhlii* | LC | | L |
| | *Pipistrellus nathusii* | LC | | L |
| | *Pipistrellus pipistrellus* | LC | | L |
| | *Plecotus auritus* | LC | | L |
| | *Rattus norvegicus* | LC | | L |
| | *Rattus rattus* | LC | | L |
| | *Rhinolophus blasii* | LC | | L |
| | *Rhinolophus euryale* | NT | | L |
| | *Rhinolophus ferrumequinum* | LC | | L |
| | *Rhinolophus hipposideros* | LC | | L |
| | *Rhinolophus mehelyi* | VU | | L |
| | *Spermophilus citellus* | EN | | L |
| | *Suncus etruscus* | LC | | L |
| | *Sus scrofa* | LC | | O 2022 |
| | *Talpa europaea* | LC | | L |
| | *Talpa levantis* | LC | | L |
| | *Vormela peregusna* | VU | | L |
| | *Vulpes vulpes* | LC | | O 2022 |



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**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix E - Questionnaires of the Community Level and Household Surveys*

Submitted to:

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**APPENDIX E**

# Questionnaires of the Community Level and Household Surveys

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**1.0 COMMUNITY LEVEL SURVEY ..... 1**

**2.0 HOUSEHOLD SURVEY ..... 17**

# COMMUNITY LEVEL SURVEY

Firstly, we would like to express our gratitude for your willingness to participate in this research. We are conducting this study on behalf of ÇOK A.Ş. to examine the social impacts of the Kınalı-Malkara Motorway Project. Your neighbourhood is one of the areas located in proximity to the proposed route and is expected to experience various positive and/or negative effects. This meeting aims to identify the general characteristics of your neighbourhood, assess the potential impacts of the project, and explore ways to mitigate any adverse effects.

| | | | |
|---|---|---|---|
| Date: | | | |
| Province: | | | |
| District: | | | |
| Village/Neighbourhood: | | | |
| Mukhtar's Name: | | | |
| Mukhtar's Phone Number: | | | |
| PROJECT INFORMATION | | | |
| When and how did you learn that the project? | | | |
| How were you informed? | | | |
| What information do you have about the project? | | | |
| Do you need more information about the project? | ☐Yes<br>☐No | | |
| What additional information do you need? | | | |
| DEMOGRAPHIC INFORMATION | | | |
| Population | | Number of Households | Population |
| | Permanent residents | | |
| | Seasonal residents | | |
| | Other (please specify) | | |
| If there is a seasonal change in the population, what is the main reason? | | | |

| | | | |
|---|---|---|---|
| Has there been a change in the population of the neighbourhood/village in the last five years? | Increased ☐ | Decreased ☐ | Same ☐ |
| If there has been a change, what is the main reason? | | | |
| Which group of the population is migrating in and which group is migrating out? | | | |

| Can you give information about the ratio of the following age groups in the settlement? | |
|---|---|
| Age groups | Ratio (%) |
| 0-5 | |
| 6-18 | |
| 19-25 | |
| 26-39 | |
| 40-55 | |
| 56-65 | |
| 65+ | |

| SOCIAL FACILITIES | | | | |
|---|---|---|---|---|
| EDUCATION | | | | |
| | | Number | If not, | |
| | | | Nearest location | Distance to the settlement (km) |
| School | Kindergarten | | | |
| | Primary education | | | |
| | Middle school | | | |
| | High school | | | |

| | |
|---|---|
| What is the total number of students living in the settlement? | |

| EDUCATIONAL STATUS (for those who are not students and those who are not of educational age) | | |
|---|---|---|
| Educational level | Number | Ratio (%) |
| Never went to school | | |
| Primary school graduate | | |
| Secondary school graduate | | |
| High school graduate | | |
| University graduate | | |

| CONFLICT | | |
|---|---|---|
| In the last five years, has there been any tension in the settlement regarding the following issues? (among the residents) | Yes | No |
| Grazing land use | | |
| Agricultural land use | | |
| Land acquisition | | |
| River use | | |
| Forest use | | |
| Well water use | | |
| Economical (e.g. work situation) | | |
| Religion | | |
| Ethnicity | | |
| Disputes between families | | |
| Other (Specify) | | |

| How were these conflicts resolved?: |
|---|
| |

| ECONOMY | |
|---|---|
| Employment Status and Average Household Income (What is the employment status of residents according to the following occupation list for the age range 16-59?) | |
| What are the main income sources in the settlement? | |
| Agricultural production (field) | |
| Agricultural production (gardening) | |
| Animal husbandry | |
| Beekeeping | |
| Forestry | |
| Tourism | 1. |
| Trade | 2. |
| Craftsmanship | 3. |
| Retirement pension | |
| Construction labour | |
| Agricultural labour | |
| Semi-skilled mining labour | |
| Skilled mining labour | |
| Social aid | |
| Real estate income | |

What are the main agricultural products of the settlement?

| Products | Quantity produced (kilo)<br>(1 ton 1000 kilos) |
|---|---|
| | |
| | |
| | |
| | |
| | |

| | | |
|---|---|---|
| | | |
| | | |
| | | |

Please indicate the number of animals in the settlement:

| | |
|---|---|
| Cattle | |
| Sheep and goat | |
| Poultry | |
| Beehive | |
| Employment Status | Ratio (%) |
| Wage worker | |
| Farmer | |
| Business owner | |
| Unemployed | |
| Daily wage worker | |
| Retired | |

Have there been any changes in job opportunities in the last five years?

☐ Increased

☐ Decreased

☐ Remained the same

If there has been a change, explanation:

What is the average household income? _____TL

Has there been a change in average household purchasing power in the last five years?

☐ Increased ☐ Decreased ☐ Remained the same

If there has been a change, explanation:

| VILLAGE/NEIGHBOURHOOD PROBLEMS | |
|---|---|
| Environmental problems (pollution, dust, noise, etc.) | |

| | |
|---|---|
| Economic Problems (income and employment) | |
| Social Problems (education, social conflicts, etc.) | |
| Health Problems (most common health problems) | |
| What are the most common crimes and crime rates, including changes/trends over the last 5 years? | |

| Identification of Vulnerable Groups | | | |
|---|---|---|---|
| Vulnerable groups | Yes/No | If yes, number | Are they affected by the project? |
| Illiterate | | | |
| Does not speak Turkish | | | |
| Seasonal worker | | | |
| Nomad communities | | | |
| Mobile beekeepers | | | |
| Refugee | | | |
| Woman-headed household | | | |
| Depend on social aid | | | |
| Those who are of educational age but do not go to school | | | |
| Persons with chronic disease/bedridden patients | | | |
| Persons over 70 years old living alone | | | |
| Persons with physical disabilities | | | |
| Persons with mental disabilities | | | |
| Earthquake victim | | | |

| INFRASTRUCTURE & SERVICES | | | |
|---|---|---|---|
| | Yes | No | Detail |
| Electricity | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Drinking water | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Potable water | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Irrigation water | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Sewage | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Heating source | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Waste disposal | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Mobile phone | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Internet | | | ☐Sufficient |

| | | | |
|---|---|---|---|
| | | | ☐Insufficient<br>Explanation |
| Roads | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Health unit | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Education | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Mosque | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Cemetery | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Transportation | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| Other | | | ☐Sufficient<br>☐Insufficient<br>Explanation |
| J. USE OF NATURAL RESOURCES | | | |
| River Use | | | |
| Is there a river within the borders of the settlement? | | | |
| Do villagers use rivers/lakes for fishing? | | | |

| | |
|---|---|
| How many households derive income from the river/lake? | |
| How many households are fishing from the river/lake for household consumption? | |
| What kind of fish/ how many kg in a year? | |
| In what season do they go fishing? | |
| Do villagers use rivers/lakes for irrigation? | |
| How many households use rivers/lakes for irrigation? | |
| Forest Use | |
| Is there a forest within the borders of the settlement? | |
| Was/will the forest be affected due to the project? | |
| Do villagers collect wood from the forest? | |
| How many households collect wood from the forest to generate income? | |
| How many households collect wood from the forest for household consumption? | |
| How many kg can be collected in a year? | |
| In what season do villagers collect wood? | |
| How many households collect plants from the forest to generate income? | |
| How many households collect plants from the forest for household consumption? | |
| How many kg can be collected in a year? | |
| In what season do villagers collect plants? | |
| Are there timber producers in the settlement? | |
| How many people are engaged in timber production? | |
| Is there hunting in the settlement? | |
| Where do villagers hunt? | |
| How many people hunt for income? | |
| How many people hunt for home consumption? | |

| | |
|---|---|
| What kind of animals do villagers hunt? | |
| Do villagers collect natural medicines from the forest? | |
| If yes, please provide details: | |
| Recreation | |
| Is there a recreation area within the borders of the settlement? | |
| Do you think these areas will be/were affected due to the project? | |
| If yes, please explain: | |
| Is there a tree or natural structure with cultural value within the village borders? | |
| If yes, please explain: | |
| Spring water | |
| Is there spring water within the borders of the settlement? | |
| What is the purpose of use? | |
| How many households use spring water? | |
| If you know the capacity of the spring water, can you specify the capacity? | |
| Do villagers use well water? | |
| What is the purpose of using well water? | |
| How many households use well water? | |

| K. Available Skills | | | |
|---|---|---|---|
| Jobs | Yes | No | Number of People |
| Engineer | | | |
| Driver | | | |
| Construction worker | | | |
| Heavy machinery operator | | | |
| Security personal | | | |

| | | | |
|---|---|---|---|
| Electrician | | | |
| Other, specify | | | |
| Other, specify | | | |

L. PROJECT IMPACTS

ECONOMY

| | | |
|---|---|---|
| Were there any impact on local employment opportunities due to the project? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Were there any impact on local supply opportunities? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Suggestions | | |

INFRASTRUCTURE AND SERVICES

| | | |
|---|---|---|
| 3. Were there any impact on health facilities? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please explain | | |
| 4. Were there any impact regarding educational opportunities? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please explain | | |
| 5. Were there any impact on transportation facilities? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |

| | | |
|---|---|---|
| Please Explain | | |
| Were there any impact on water infrastructure? | One.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Were there any impact on electrical infrastructure? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Do you think the project put pressure on the existing infrastructure? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Suggestions | | |
| POPULATION | | |
| Were there any impact on the population level (such as population influx)? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Were there any social conflict with the project staff? | 1.☐ Yes<br>2.☐ No | |
| Please Explain | | |
| Suggestions | | |

| PUBLIC HEALTH AND SAFETY | | |
|---|---|---|
| Do residents of the village experience any noise-related impact?<br><br>Please Explain<br><br>Suggestions | 1.☐ Yes<br>2.☐ No | 1.☐ Construction<br>2.☐ Operation |
| Do residents of the village experience any impact related to dust?<br><br>Please Explain<br><br>Suggestions | 1.☐ Yes<br>2.☐ No | 1.☐ Construction<br>2.☐ Operation |
| Do residents of the village experience any impact on traffic?<br><br>Please Explain<br><br>Suggestions | 1.☐ Yes<br>2.☐ No | 1.☐ Construction<br>2.☐ Operation |
| Do residents of the village experience any impact on water quality or level?<br><br>Please Explain<br><br>Suggestions | 1.☐ Yes<br>2.☐ No | 1.☐ Construction<br>2.☐ Operation |

| | | |
|---|---|---|
| Does the project create security problems? | 1.☐ Yes<br>2.☐ No | 1.☐ Construction<br>2.☐ Operation |
| Please Explain | | |
| Suggestions | | |

| INCOME SOURCES | | |
|---|---|---|
| Will/Did the project create physical displacement? | 1.☐ Yes<br>2.☐ No | |
| Please Explain | | |
| Suggestions | | |
| Will/Did the project cause any change in the livelihoods of the local people? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Suggestions | | |
| Will/did the project affect livelihood from livestock farming? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Suggestions | | |

| | | |
|---|---|---|
| Will/Did the project affect agricultural income? | 1.☐ Yes<br>2.☐ No | 1.☐ Positive<br>2.☐ Negative |
| Please Explain | | |
| Suggestions | | |
| Will/Did the project cause loss of pasture areas? | 1.☐ Yes<br>2.☐ No | |
| Please Explain | | |
| Suggestions | | |

Are there any other projects within the borders of the settlement that may have an impact during the construction or operation period? If yes, please specify.

Is there anything else you would like to add?

Household Survey

# HOUSEHOLD SURVEY

Firstly, we would like to express our gratitude for your willingness to participate in this research. We are conducting this study on behalf of ÇOK A.Ş. to examine the social impacts of the Kınalı-Malkara Motorway Project. Your neighbourhood is one of the areas located in proximity to the proposed route and is expected to experience various positive and/or negative effects. This meeting aims to identify the general characteristics of your neighbourhood, assess the potential impacts of the project, and explore ways to mitigate any adverse effects.

| A. GENERAL | |
|---|---|
| Name of the person conducting the survey | |
| Survey number | |
| Date | |
| Name of the settlement | |

| B. INFORMATION ABOUT THE PARTICIPANT | |
|---|---|
| Name: | |
| Phone number: | |
| Address: | |
| Gender | 1.☐ Female 2.☐ Male |
| Age | |
| Do you have information about the project? | 1.☐ Yes<br>2.☐ No |
| What kind of information do you have about the project? | |
| Where did you get this information? | |

| | |
|---|---|
| Do you think your knowledge level is sufficient? | |
| What would you suggest increasing your knowledge level? | |
| How would you like to convey your complaints and suggestions? | |

| B1) ECONOMIC LEVEL CHARACTERISTICS OF HOUSEHOLD INDIVIDUALS | | | | | |
|---|---|---|---|---|---|
| ID | a.<br>Name of household members | Household Characteristics | | | |
| | | Proximity to the head of household | Marital status | Educational Status | Age |
| ATTENTION: Write the names of individuals in the table, the order is important. (Questions should be asked name by name) | | Head of household<br>Partner<br>Child<br>Grandchildren<br>Mother<br>Father<br>Sister<br>Brother<br>Other | Single<br>Married<br>Divorced<br>Spouse is dead.<br>Lives separated from the spouse.<br>Other (specify) | Number of children not of educational age (0-6):<br>Number of children of primary school age:<br>Number of adults who have never been to school and are illiterate:<br>Number of adults who have never gone to school but can read and write:<br>Number of primary school graduates:<br>Number of people graduating from secondary school:<br>Number of people graduating from high school:<br>Number of university graduates: | |
| one | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |

| B2) ECONOMIC LEVEL CHARACTERISTICS OF HOUSEHOLD INDIVIDUALS | | | | | | |
|---|---|---|---|---|---|---|
| ID | a. Name of household members | Employee level status | | | | |
| | | b. Working status | c. Professions/Job | D. Status | h. Social security | i.Monthly earnings |
| ATTENTION: Write the names of individuals in the table, the order is important. (Questions should be asked name by name) | | Works (go to option “e”)<br>Not working<br>Housewife<br>Retired<br>Student<br>Can't Find a Job<br>Not economically active (under 16) (scroll to "e") | What are the professions of the people in the household? (specify in the boxes) (answers such as student, retiree, housewife will not be written)<br><br>After completing the survey, indicate the number of professions and people below. | 1. Wage/salaried employee<br>2. Employer<br>3. Works for their own account<br>4.Unpaid family worker<br>5. Retired<br>6. Other status | None<br>SSK<br>Pension fund<br>Bag-Kur<br>Private insurance | Specify the monthly amount separately for all persons. TL |
| one | | | | | | .. |
| 2 | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 3 | | | | | | |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | | | | | | |

| B3) Vulnerability classification of the household | | | |
|---|---|---|---|
| | Yes | No | Number of People |
| illiterate | | | |
| who does not speak Turkish | | | |
| female head of household | | | |
| Living on state aid | | | |
| living with the help of the private association | | | |
| have a physical disability | | | |
| have a mental disability | | | |
| Unemployed | | | |
| Having a chronic illness | | | |
| Other (Specify) | | | |

| C CONDITIONS OF THE HOUSE YOU LIVE IN | |
|---|---|
| How do you evaluate the conditions of the house you live in compared to other houses in the area? | 1.☐ Better<br>2.☐ Average<br>3.☐ More dark |
| What is the size of your house | ☐0-25 m²<br>☐25-50 m²<br>☐50-200 m²<br>☐200 m² + |
| How many years have you lived in this house? | ……..... years |
| In which months of the year do you live here? | |
| Where do you live when you are not staying here? | |
| Do all members of the family live at this address? | |
| What is the ownership status of your home? | 1. ☐Owner<br>2. ☐Tenant..... ....TL<br>3. ☐Lives without paying rent<br>4.☐ Other (specify)…… |
| What is your drinking water source? | 1. ☐Closed spring water<br>2. ☐Open spring water<br>3. ☐Well water<br>4. ☐Transported water<br>5. ☐Municipal water<br>6. ☐Stream/river<br>7. ☐Village fountain<br>8.☐ Other (specify)…… |
| What is your irrigation water source? | 1. ☐Closed spring water<br>2. ☐Open spring water<br>3. ☐Well water<br>4. ☐Transported water |

| | |
|---|---|
| | 5. ☐ Municipal water<br>6. ☐Stream/river<br>7. ☐Village fountain<br>8.☐ Other (specify)…… |
| What is your potable water source? | 1. ☐Closed spring water<br>2. ☐Open spring water<br>3. ☐Well water<br>4. ☐Transported water<br>5. ☐ Municipal water<br>6. ☐Stream/river<br>7. ☐Village fountain<br>8.☐ Other (specify)…… |
| Are you experiencing a power outage? | ☐Every day<br>☐few hours a day<br>☐several times a week<br>☐Rarely<br>☐Never |
| Is there a wastewater system? | ☐Sewage<br>☐discharge into stream<br>☐septic tank<br>☐ Other (specify)…….. |

| | |
|---|---|
| What is your heating source? | ☐Coal<br>☐Electric<br>☐Gas<br>☐ Wood<br>☐Sun<br>☐Other (specify)…… |
| How do you dispose of waste? | ☐Incineration<br>☐ municipal services<br>☐Burying |

| | |
|---|---|
| | ☐Waste site designated by the municipality<br>☐Waste site not designated by the municipality<br>☐Other (specify)…… |
| Which of the following do you have? | |

| | Yes | No | Number |
|---|---|---|---|
| Computer | ☐ | ☐ | |
| Internet | ☐ | ☐ | |
| Car | ☐ | ☐ | |
| Tractor | ☐ | ☐ | |
| agricultural vehicle | ☐ | ☐ | |
| Other | ☐ | ☐ | |
| Other | ☐ | ☐ | |

## D. INCOME SOURCES

What are your main sources of income? (Code in order of importance from one to 3)

[ ] Agriculture

[ ] Small business owner

[ ] Seasonal agricultural worker

[ ] Civil servant

[ ] Retired

[ ] Rent

[ ] Paid/salaried

[ ] Animal husbandry

[ ] Other (Specify): ..... .....

[ ] Other (Specify): ..... .....

What is your average monthly income?

☐ 0-2000 TL

☐ 2000- 4000 TL

☐ 4000- 6000 TL

☐ 6000- 8000 TL

☐ 8000- 10000 TL

☐ over 10,000 TL

| E. Land | | | |
|---|---|---|---|
| E.1. land ownership<br>Public (used without permission)<br>Public (legal)<br>For rent<br>Sole owner<br>Shareholder<br>It belongs to someone else; they use it without renting. | E.2.Land Size | E.3.Land type?<br>irrigated agricultural land<br>dry agricultural land<br>land with zoning<br>forest land<br>treasury land<br>pasture<br>Other (specify)<br>Other (specify) | E.4. Purpose of usage?<br>agricultural production<br>letting<br>not in use<br>Greenhouse |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |

| F. AGRICULTURAL PRODUCTION |
|---|

F.1. Are you cultivating the land?

1.( ) Yes

2.( ) No

F.2. If yes, fill in the table

| F.1.a Main products | F.1.b Total quantity of the product | F.1.c. What percentage is consumed by households? | F.1.d. What percentage is sold? |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

| F.1.a Main products | F.1.b Total quantity of the product | F.1.c. What percentage is consumed by households? | F.1.d. What percentage is sold? |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

F.3.) Has there been a change in agricultural production in the last 5 years?

1.( ) Increased

2.( ) Decreased

| F.4. The reason for the increase | F.5. The reason for the decrease |
|---|---|
| [ ] Amount of rainfall | [ ] Low prices |
| [ ] Starting to use fertilizers and pesticides | [ ] Lack of manpower |
| [ ] Starting to use organic fertilizer | [ ] Stopping the use of fertilizers and pesticides |
| [ ] Improvement in cultivation techniques | [ ] Stopping the use of organic fertilizers |
| [ ] Using high quality seeds | [ ] Changes in agricultural activities |
| [ ] Access to irrigation | [ ] Lack of technology |
| | [ ] Drought |

F.6. Total income from agriculture ……TL

F.7. Are you interested in animal husbandry?

1.( )Yes

2.( )No

F.8. If yes, fill in the table below

| F.9. Genus | F.10 Number |
|---|---|
| 1. Cattle | |
| 2. Sheeps and goats | |
| 3.Poultry | |
| 3. Beehives | |
| 5. Other ( ) | |
| 6. Other ( ) | |

F.11. Total income from animal husbandry……TL

| G. EXPENDITURES | |
|---|---|
| Expenditure Items | Total annual expense TL |
| Food and drink | |
| Rent | |
| Household bills (water, electricity, heating, telephone, internet) | |
| Irrigation water | |
| Clothes | |
| Health | |
| Education | |
| Seeds, fertilizers, and agricultural chemicals | |
| fuel for agriculture | |
| animal feed/health | |
| Specify others | |

| H. AVAILABLE SKILLS | |
|---|---|
| ☐Engineer | ☐Cleaner |
| ☐Chauffeur | ☐Security guard |
| ☐Machine operator | ☐Cook |
| ☐Master Construction worker (specify field ……) | ☐Office worker (secretary/accounting) |
| ☐unskilled construction worker | ☐Other (specify) |
| ☐Technician (specify field) | ☐Other (specify) |
| | ☐Other (specify) |

| I. HOUSEHOLD PROBLEMS | | | |
|---|---|---|---|
| Problems | Very important | Important | Not Important |
| I.1. Unemployment | | | |
| I.2. Low Income | | | |

| | | | |
|---|---|---|---|
| I.3. cost of living | | | |
| I.4. Security | | | |
| I.5. Transport | | | |
| I.6. Lack of educational services | | | |
| I.7. Inadequate water supply | | | |
| I.8. Insufficient electricity supply | | | |
| I.9. Inadequate housing conditions | | | |
| I.10. Waste Disposal | | | |
| I.11. Telecommunication | | | |
| I.12. Other | | | |
| I.13. Other | | | |
| I.14. Other | | | |
| I.15. What can be done to overcome the problems you mentioned, what are your opinions? | | | |

| J. USE OF NATURAL RESOURCES River Use | |
|---|---|
| Is there a river within the borders of the village/ neighborhood? | |
| For what purpose do you use this river? | |
| Will this river be affected due to the project? | |
| What effect do you expect? | |
| What are your suggestions? | |
| Forest Use | |
| Is there a forest within the borders of the village/ neighborhood? | |
| For what purpose do you use this forest? | |
| Will this forest be affected due to the project? | |
| What effect do you expect? | |
| What are your suggestions? | |
| Recreation Area | |
| Is there a recreation area within the borders of the village/ neighborhood? | |
| Do you use this recreation area for any purpose? | |

| | |
|---|---|
| Will this recreation area be affected due to the project? | |
| What effect do you expect? | |
| What are your suggestions? | |
| Marine Use | |
| How far is your village from the sea? | |
| Do you use the sea for tourism, transportation or fishing purposes? | |
| Will your sea use be affected due to the project? | |
| What effect do you expect? | |
| What are your suggestions? | |
| Cultural Areas | |
| Is there an area, building or tree of spiritual value in your village? | |
| Do you use this area? | |
| Will this area be affected due to the project? | |
| What effect do you expect? | |
| What are your suggestions? | |
| Source Water Use | |
| Is there spring water in your village? | |
| Do you use this water? If yes, for what purpose? | |
| Will water resources be affected due to the project? | |
| What effect do you expect? | |
| What are your suggestions? | |
| Well Water Usage | |
| Is there well water in your village? | |
| Do you use this water? If yes, for what purpose? | |
| Will water resources be affected due to the project? | |
| What effect do you expect? | |
| What are your suggestions? | |

| L. PROJECT IMPACTS | | | |
|---|---|---|---|
| ECONOMY | | | |
| Do you expect an impact on local employment opportunities? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect an impact on local supply opportunities? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| INFRASTRUCTURE AND SERVICES | | | |
| Do you expect an impact on health facilities? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect an impact on educational opportunities? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |

| | | | |
|---|---|---|---|
| Please Explain | | | |
| Suggestions | | | |
| Do you expect an impact on transportation facilities? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect any impact on water infrastructure? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect any impact on electrical infrastructure? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| POPULATION | | | |
| Do you expect any impact on the population? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation |

| | | | |
|---|---|---|---|
| | | | 3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect any impact with project staff? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Will the project temporarily or permanently affect your lands or the lands of local people? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| PUBLIC HEALTH AND SAFETY | | | |
| Do you expect any noise-related impact? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommisioning |
| Please Explain | | | |
| Suggestions | | | |

| | | | |
|---|---|---|---|
| Do you expect any impact related to dust? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect any impact on traffic? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect any impact on project water quality or level? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Will the project create security problems? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |

| | | | |
|---|---|---|---|
| Will the project create problems with waste? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect any impact from blasting? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Do you expect any other effects? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| INCOME SOURCES | | | |
| Will the project create physical displacement? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |

| | | | |
|---|---|---|---|
| | | | |
| Suggestions | | | |
| Will your income from agriculture be affected due to the project? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Will your income from animal husbandry be affected due to the project? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Will the project cause loss of pasture areas? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Will the project cause loss of historical areas? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |

| | | | |
|---|---|---|---|
| Please Explain | | | |
| Suggestions | | | |
| Will the project cause the loss of cultural or spiritual sites? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Will the project affect income from fishing? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |
| Will the project have an impact on income from tourism? | 1.☐ Yes<br>2.☐ No | 1. ☐Positive<br>2.☐ Negative | 1. ☐Construction<br>2.☐ Operation<br>3.☐ Decommissioning |
| Please Explain | | | |
| Suggestions | | | |

Are there any other projects within the borders of the neighbourhood that may have an impact during the construction or operation period?



wsp.com

**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix F - Cultural Heritage Findings*

Submitted to:

**ÇOK A.Ş.**

1915 Çanakkale Ana Kontrol Merkezi Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, Çanakkale

Submitted by:

**WSP Danışmanlık ve Mühendislik Ltd. Şti.**

Hollanda Cad. 691. Sok. Vadi Sitesi No:4, Yıldız 06550 Ankara, Turkey

+90 312 4410031

22519766-final draft

March, 2025



**APPENDIX F**

# Cultural Heritage Findings

# COORDINATES TABLE

| CODE | X | Y |
|---|---|---|
| HRM-1 | 593597.7 | 4550179 |
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wsp.com

**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix G - Air Dispersion Maps*

Submitted to:

**ÇOK A.Ş.**
1915 Çanakkale Ana Kontrol Merkezi Gazi Süleyman Paşa Mahallesi Dumlupınar Caddesi No: 6 17800 Lapseki, Çanakkale

Submitted by:

**WSP Danışmanlık ve Mühendislik Ltd. Şti.**
Hollanda Cad. 691. Sok. Vadi Sitesi No:4, Yıldız 06550 Ankara, Turkey

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22519766-final draft

March,2025



**APPENDIX G**

# Air Dispersion Maps

# CONSTRUCTION PHASE

## Scenario-1 – Study Area-1 and Study Area-2 – Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ 0-35 km PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 38.43104 | ug/m^3 | 590825.60 | 4557762.18 | 166.80 | 0.00 | 171.00 | 10.11.2015, 24 |
| 24-HR | 35TH | 11.04079 | ug/m^3 | 584229.52 | 4547374.07 | 67.41 | 0.00 | 67.41 | 5.10.2015, 24 |
| ANNUAL | | 3.03663 | ug/m^3 | 584229.52 | 4547374.07 | 67.41 | 0.00 | 67.41 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.06015 | g/m^2 | 584229.52 | 4547374.07 | 67.41 | 0.00 | 67.41 | |
| 24-HR | 35TH | 0.01950 | g/m^2 | 584229.52 | 4547374.07 | 67.41 | 0.00 | 67.41 | |
| ANNUAL | | 2.24399 | g/m^2 | 584229.52 | 4547374.07 | 67.41 | 0.00 | 67.41 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM10\0-35\0-35.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 1: Scenario-1 Modelling Results for Settled Dust and PM10**

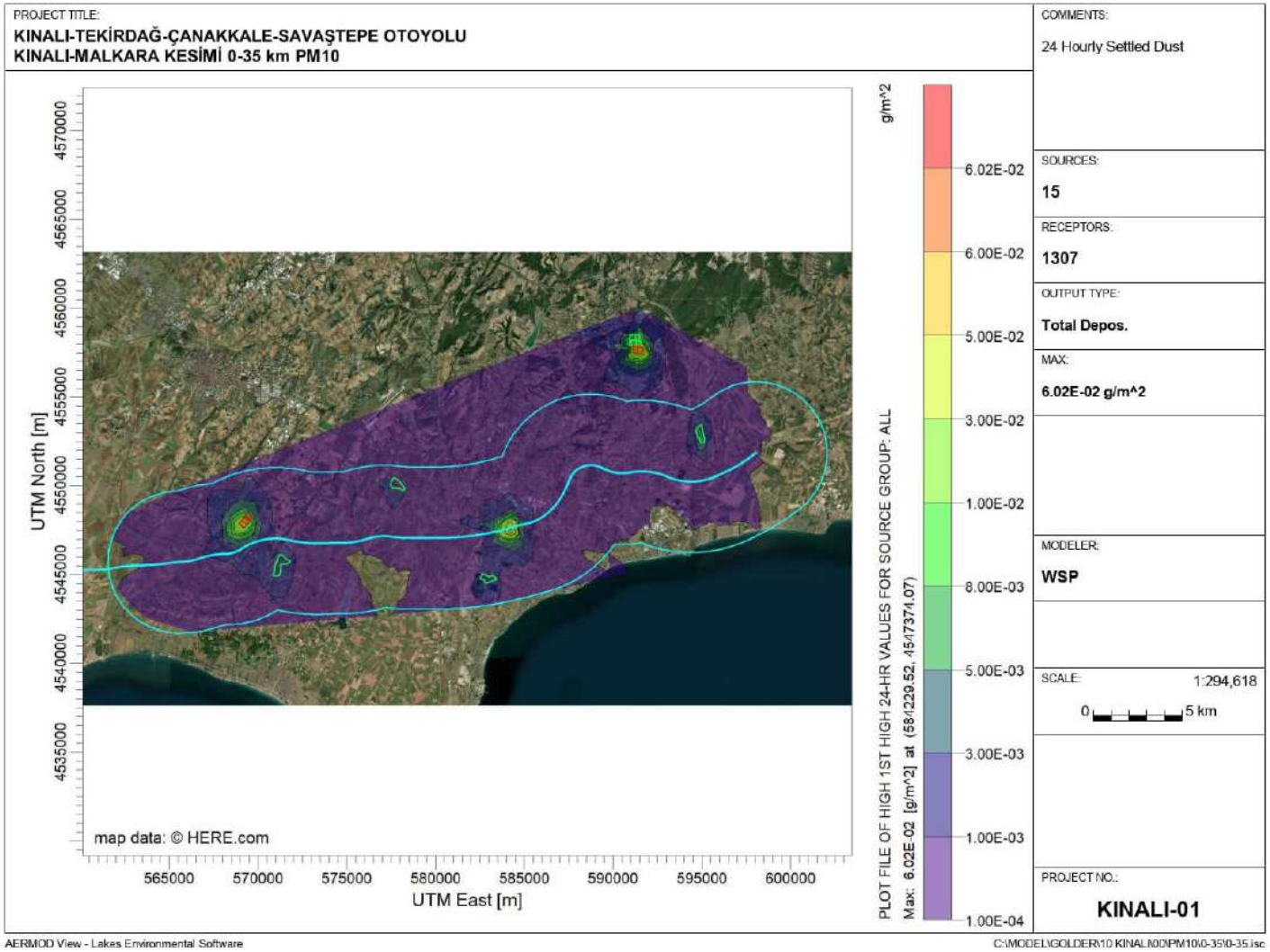



**Figure 2: Scenario-1 - Dispersion Map of Settled Dust - 24 hourly**

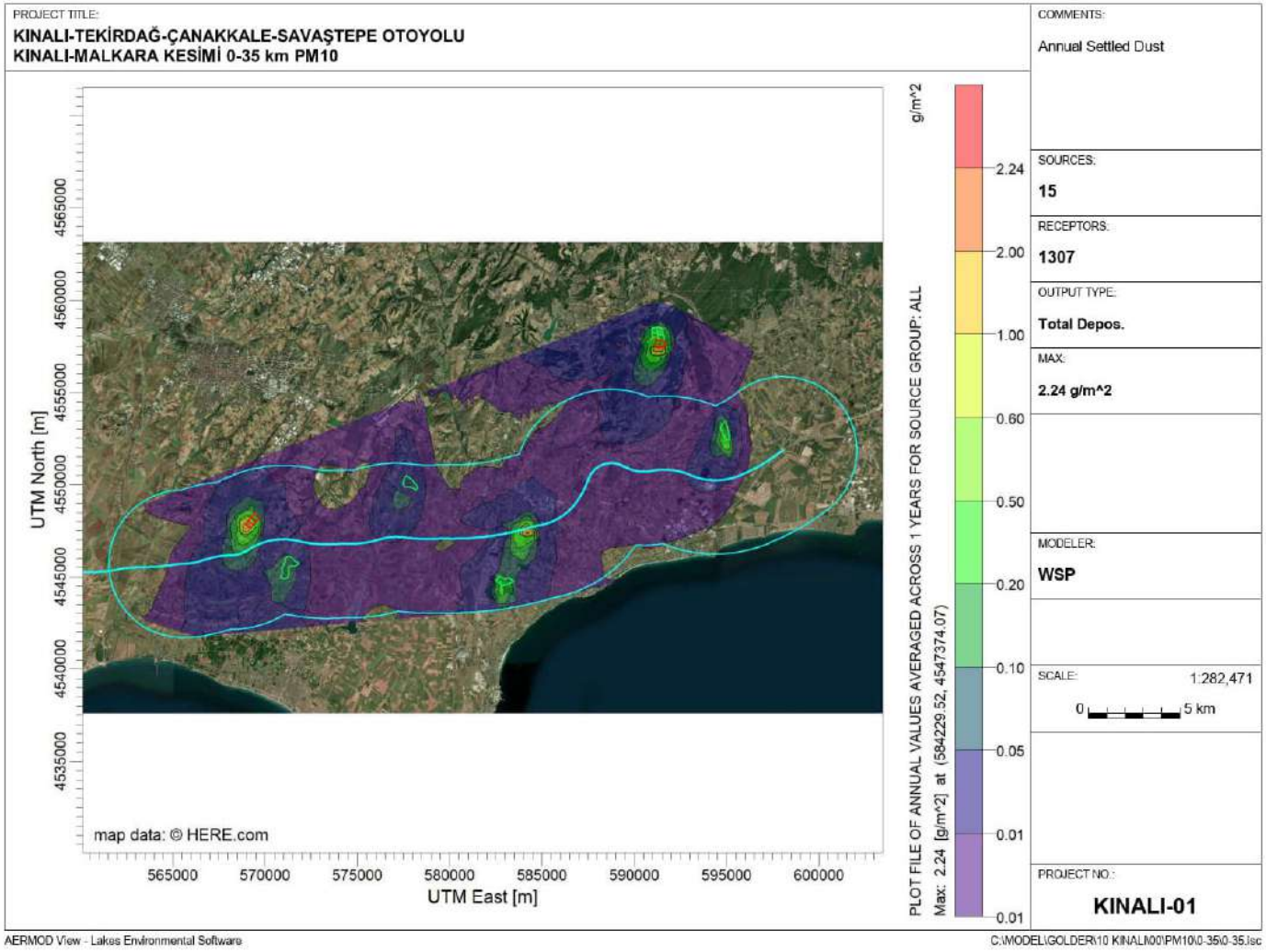



**Figure 3: Scenario-1 - Dispersion Map of Settled Dust -Yearly**

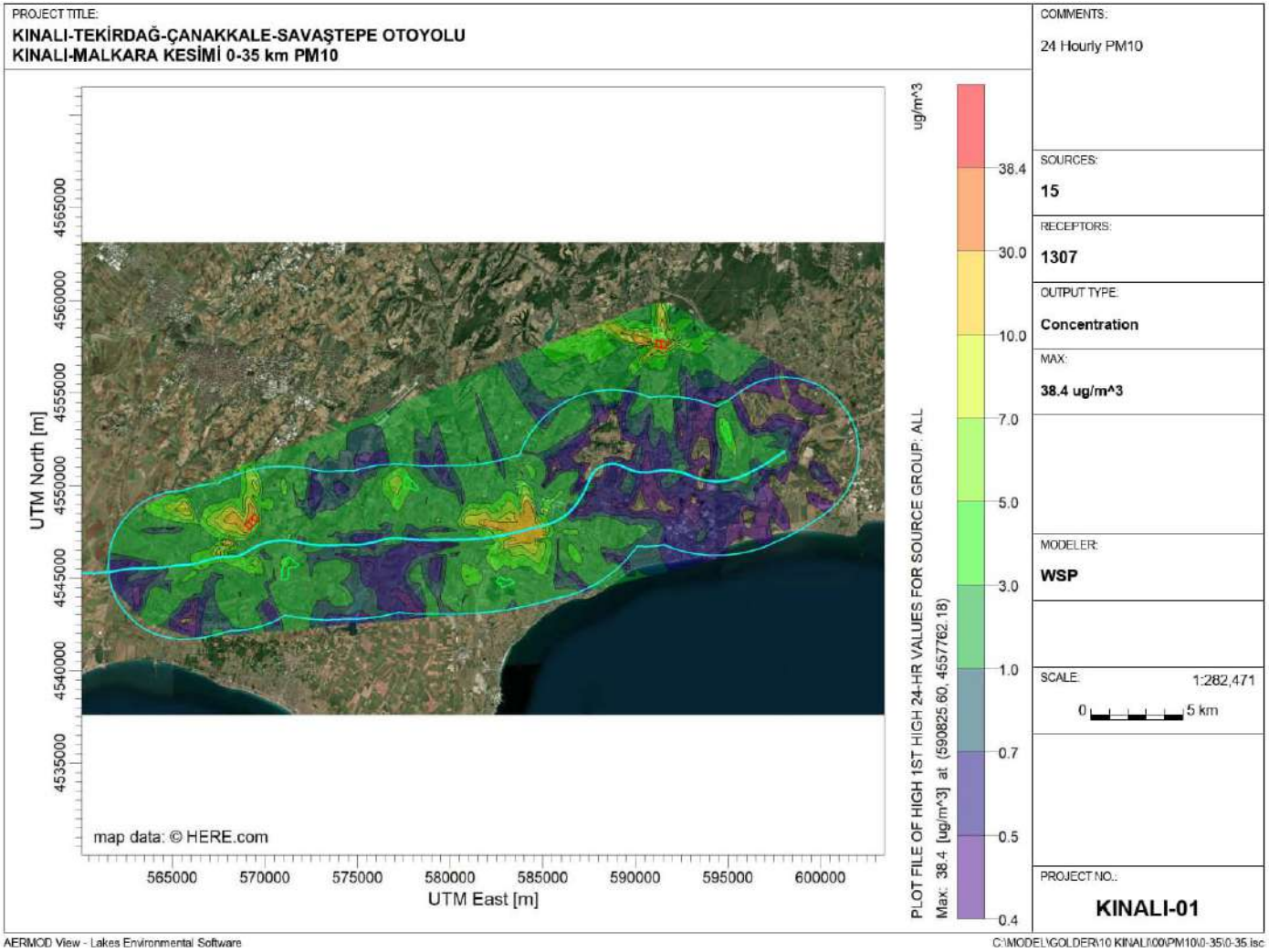



**Figure 4: Scenario-1 - Dispersion Map of PM10 - 24 hourly**

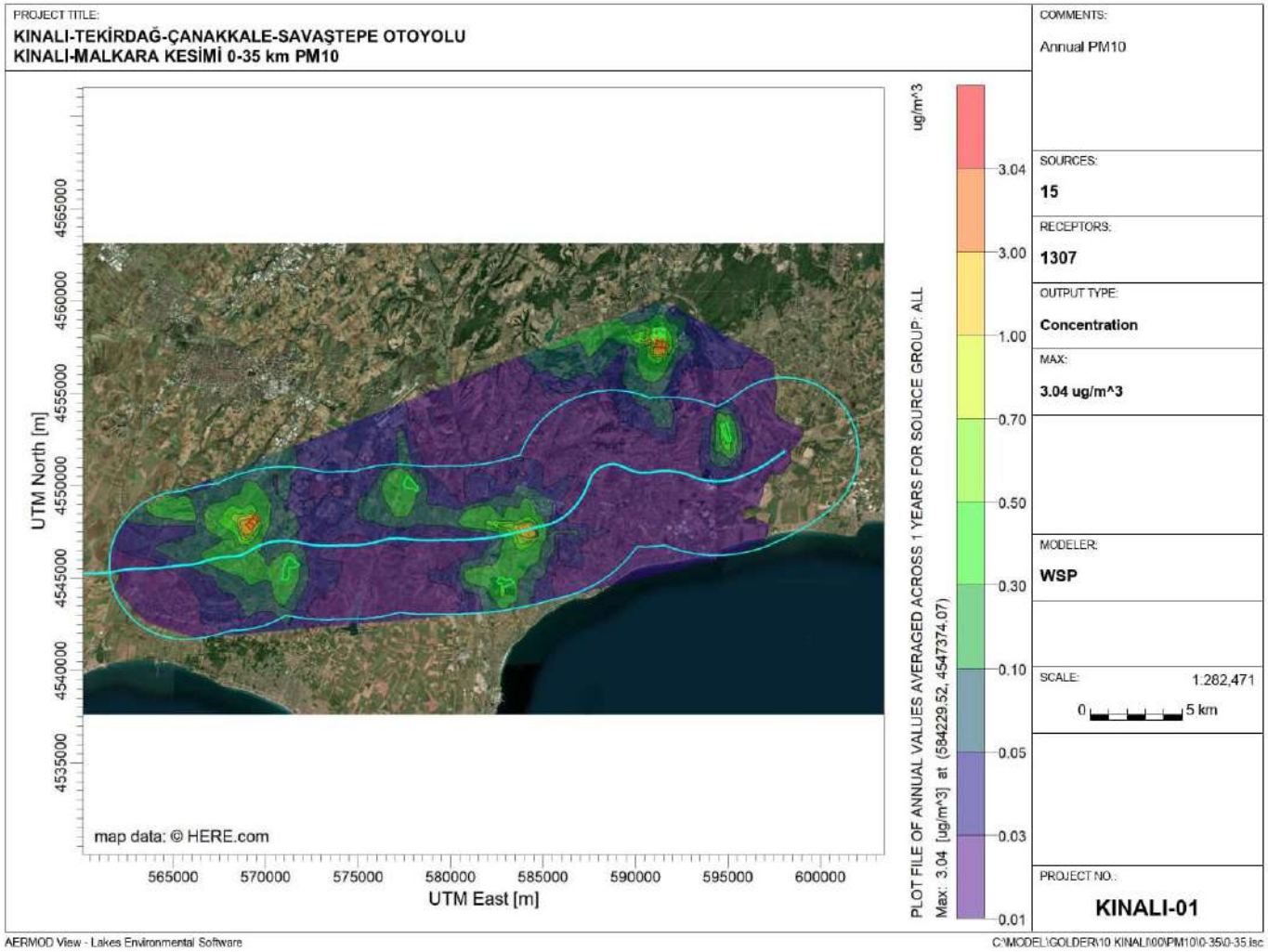



**Figure 5: Scenario-1 - Dispersion Map of PM10 - Yearly**

## Scenario-2 – Study Area-3 - Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ 35-70 km PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 15.52008 | ug/m^3 | 536296.42 | 4542847.23 | 217.48 | 0.00 | 257.00 | 29.10.2020, 24 |
| 24-HR | 35TH | 2.06201 | ug/m^3 | 543519.57 | 4543080.03 | 203.36 | 0.00 | 251.00 | 5.11.2020, 24 |
| ANNUAL | | 0.66935 | ug/m^3 | 568487.59 | 4547882.33 | 63.37 | 0.00 | 117.00 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.00699 | g/m^2 | 554116.84 | 4541960.93 | 100.31 | 0.00 | 100.31 | |
| 24-HR | 35TH | 0.00278 | g/m^2 | 554116.84 | 4541960.93 | 100.31 | 0.00 | 100.31 | |
| ANNUAL | | 0.26806 | g/m^2 | 554116.84 | 4541960.93 | 100.31 | 0.00 | 100.31 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM10\35-70\35-70.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 6: Scenario-2 Modelling Results for Settled Dust and PM10**

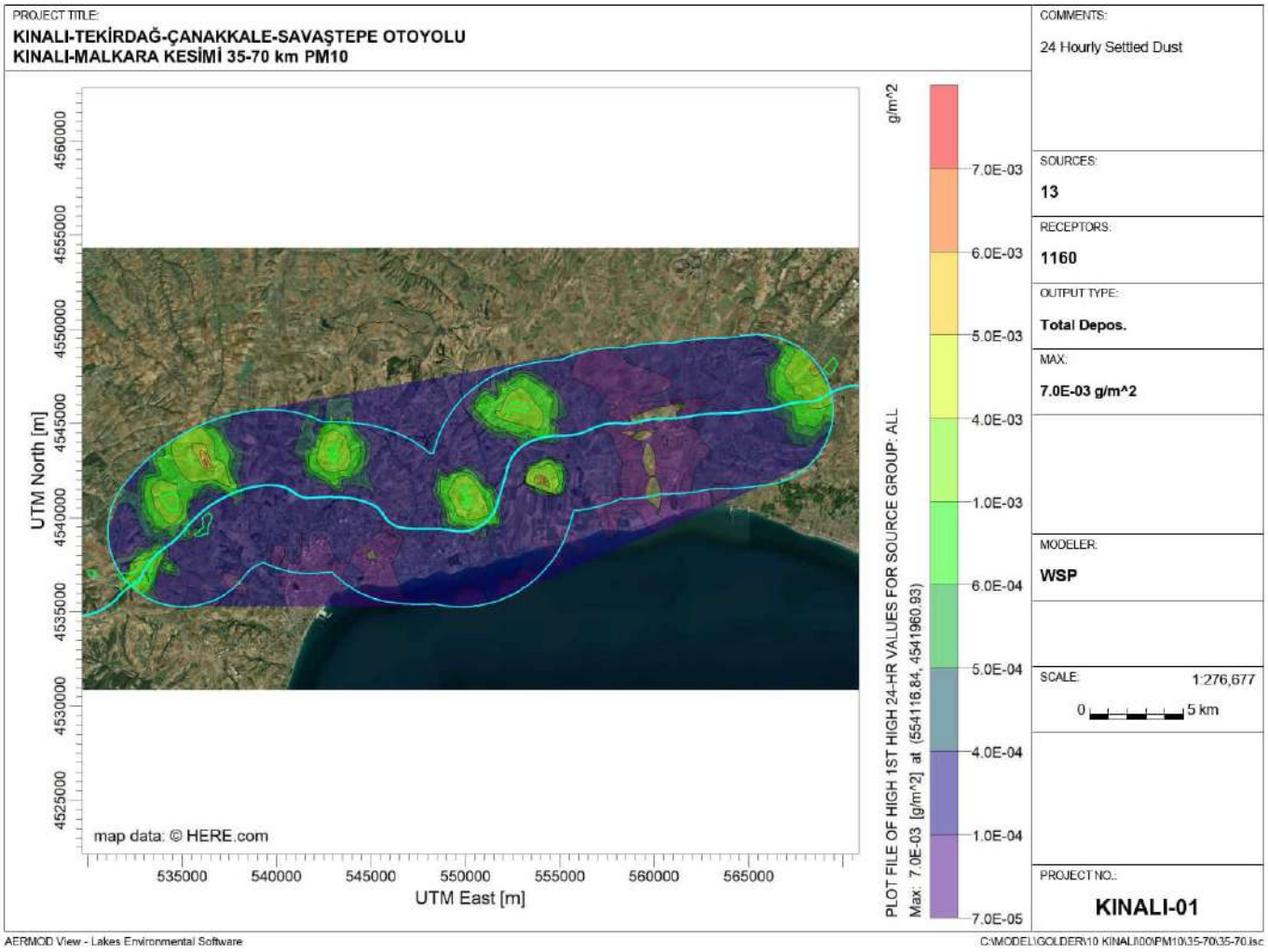



**Figure 7: Scenario-2 - Dispersion Map of Settled Dust - 24 hourly**

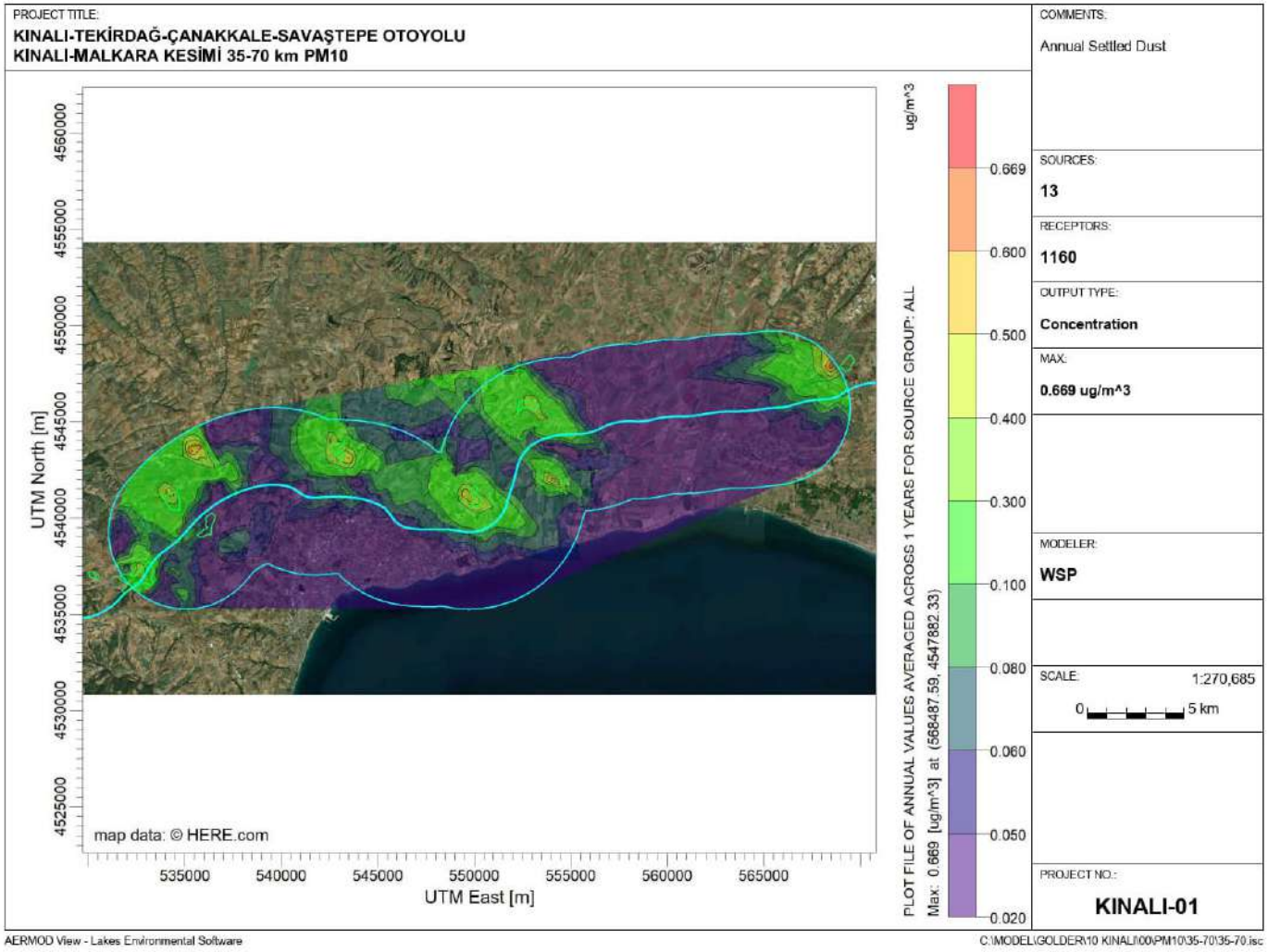



**Figure 8: Scenario-2 - Dispersion Map of Settled Dust - Yearly**

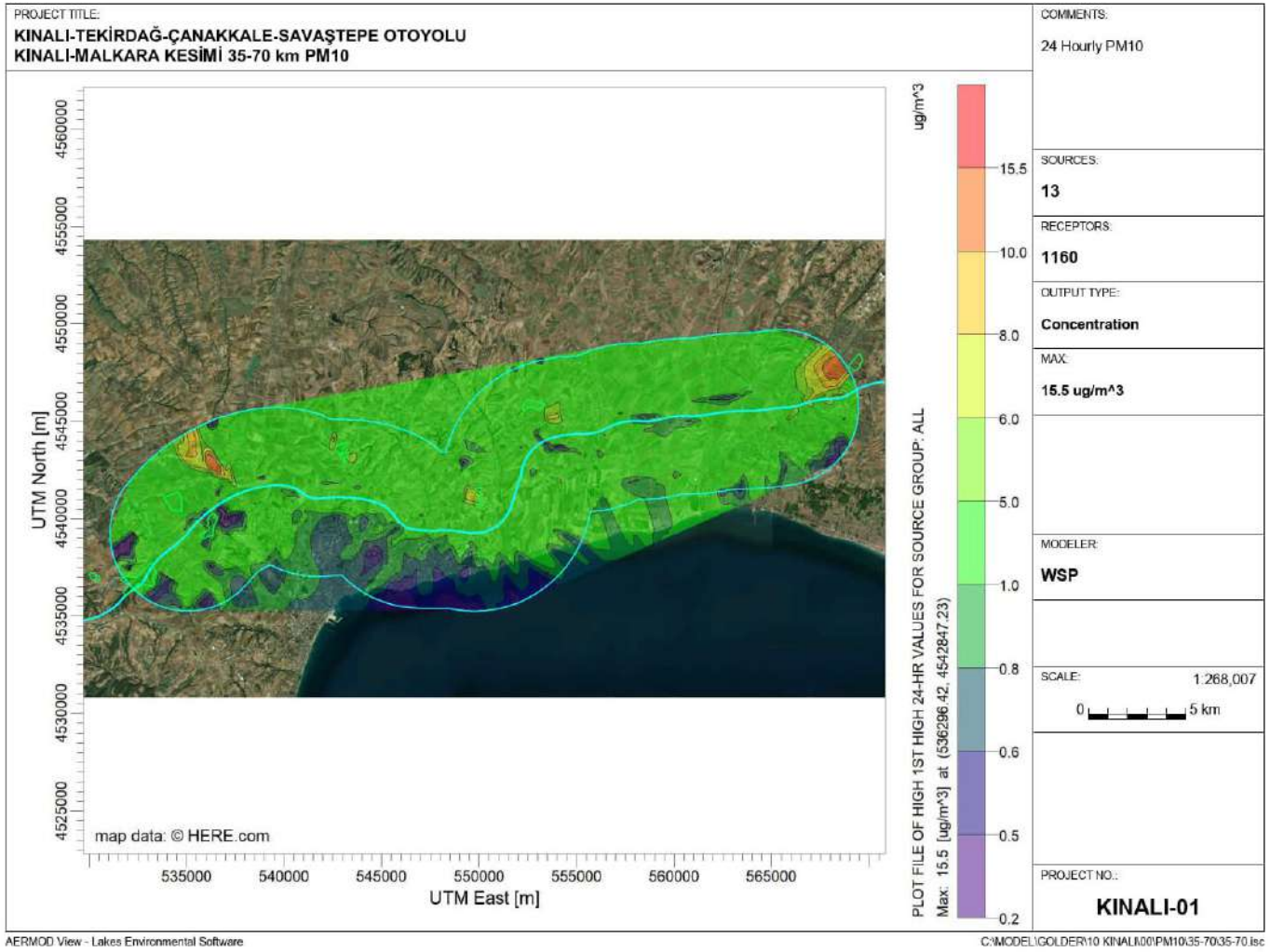



**Figure 9: Scenario-2 - Dispersion Map of PM10 - 24 hourly**

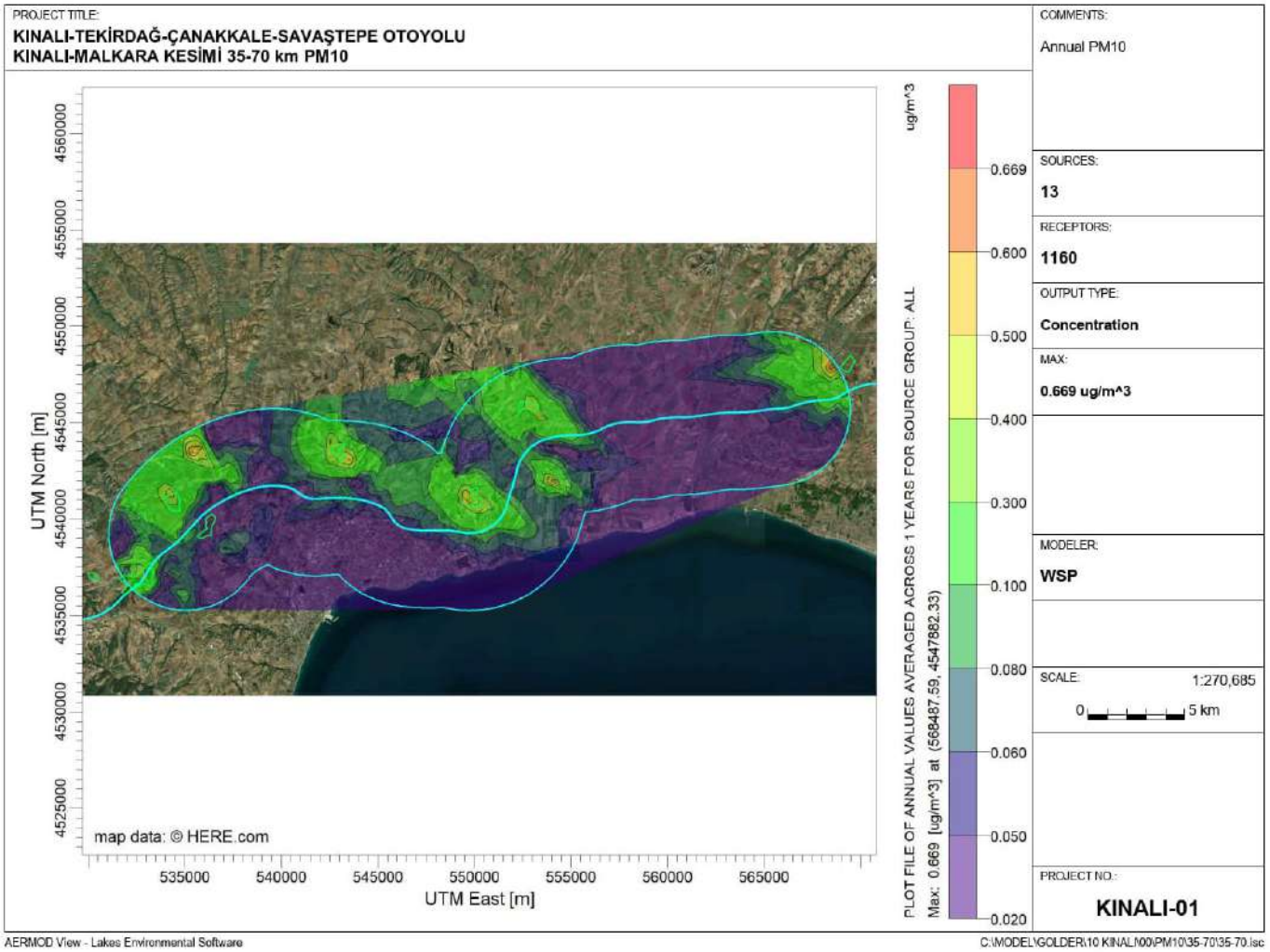



**Figure 10: Scenario-2 - Dispersion Map of PM10 - Yearly**

## Scenario-3 – Study Area-4 – Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ 70-105 km PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 71.22510 | ug/m^3 | 525205.54 | 4531128.80 | 156.92 | 0.00 | 184.00 | 21.12.2021, 24 |
| 24-HR | 35TH | 9.59727 | ug/m^3 | 535918.27 | 4543179.83 | 232.19 | 0.00 | 254.00 | 20.04.2021, 24 |
| ANNUAL | | 2.95581 | ug/m^3 | 535918.27 | 4543179.83 | 232.19 | 0.00 | 254.00 | |
| 24 | | 2.00000 | COUNT | 525205.54 | 4531128.80 | 156.92 | 0.00 | 184.00 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.03476 | g/m^2 | 525205.54 | 4531128.80 | 156.92 | 0.00 | 184.00 | |
| 24-HR | 35TH | 0.00963 | g/m^2 | 535918.27 | 4543179.83 | 232.19 | 0.00 | 254.00 | |
| ANNUAL | | 0.97851 | g/m^2 | 535918.27 | 4543179.83 | 232.19 | 0.00 | 254.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM10\70-105\70-105.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 11: Scenario-3 Modelling Results for Settled Dust and PM10**

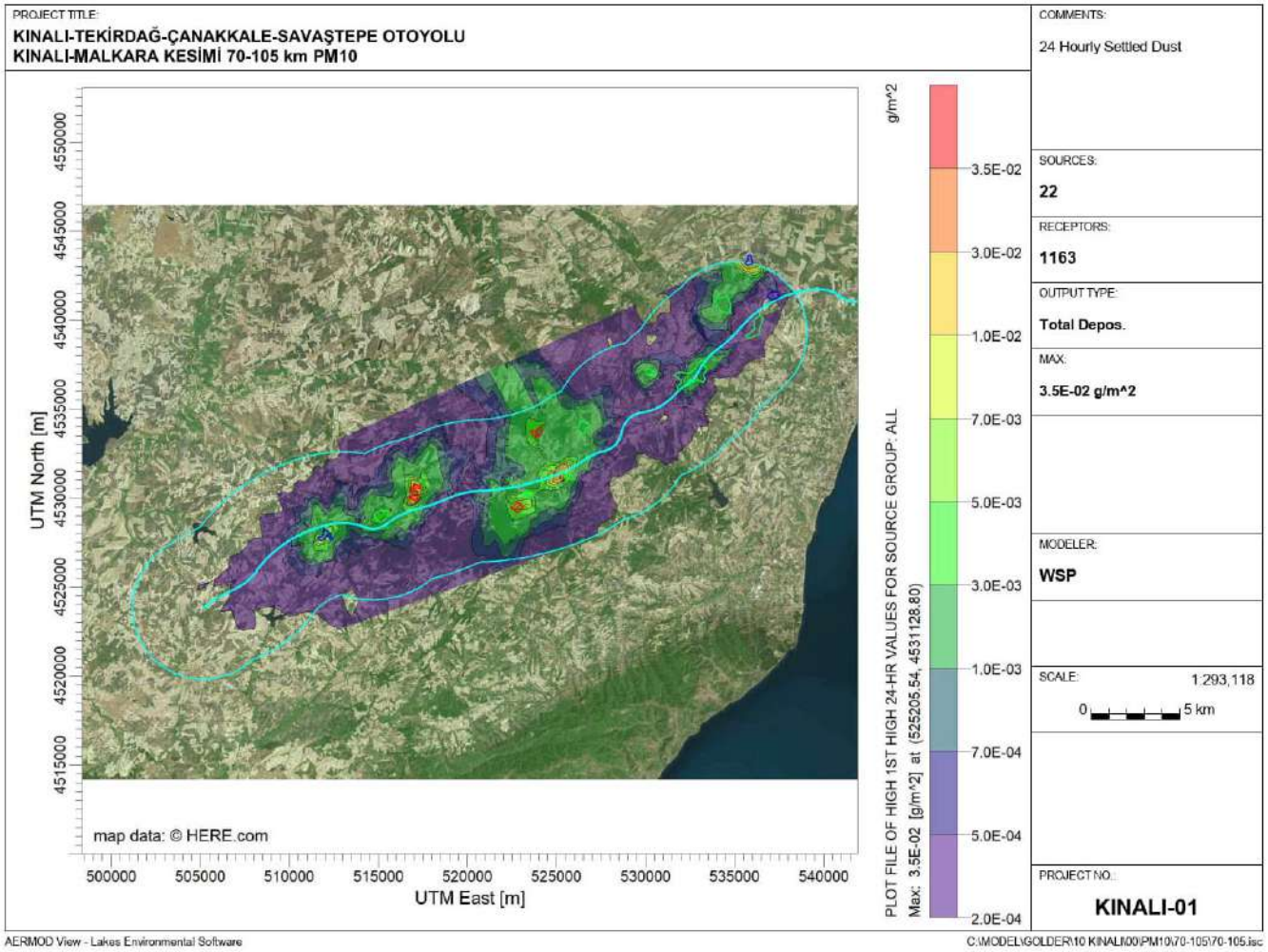



**Figure 12: Scenario-3 - Dispersion Map of Settled Dust - 24 hourly**

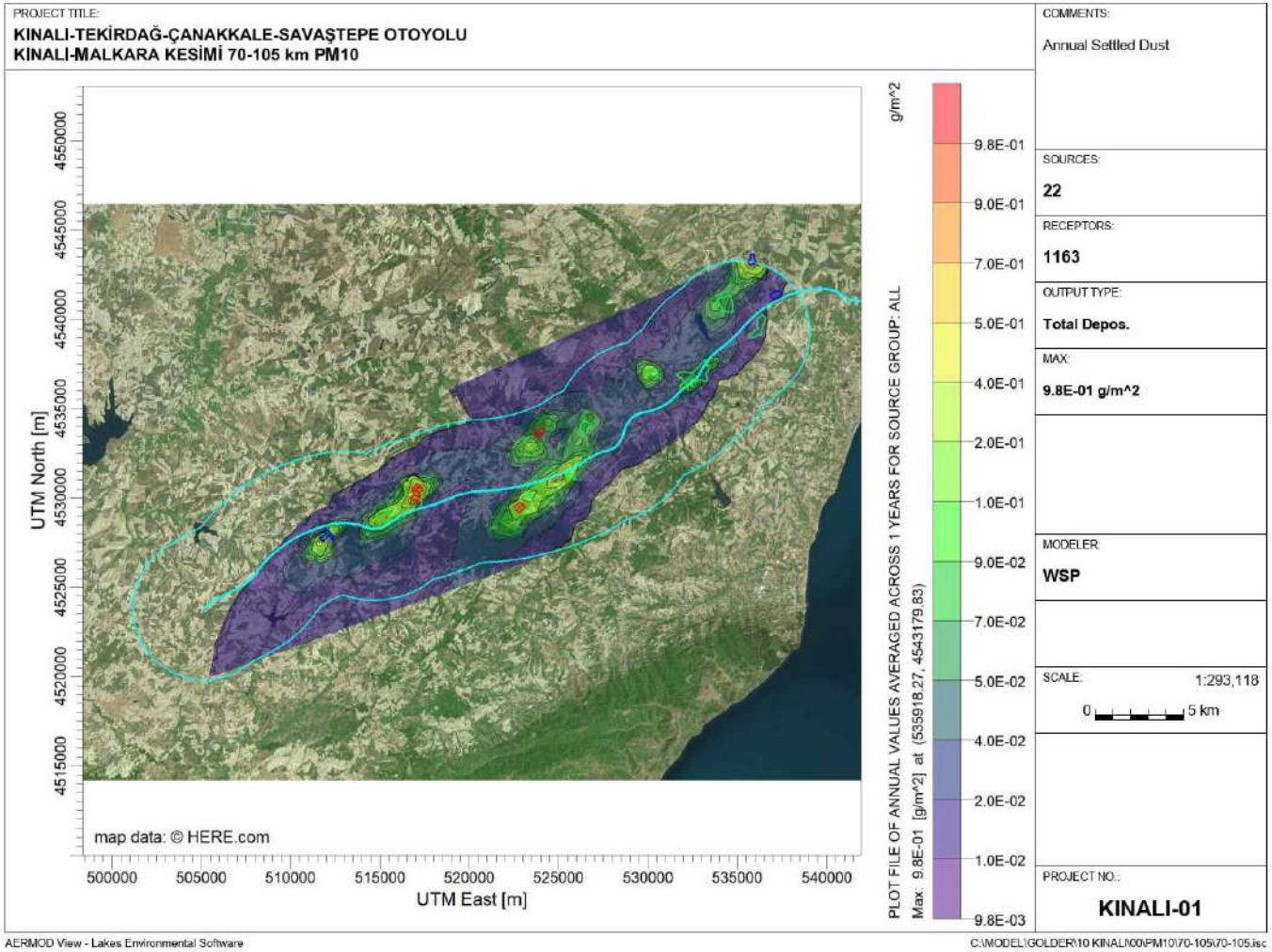



**Figure 13: Scenario-3 - Dispersion Map of Settled Dust - Yearly**

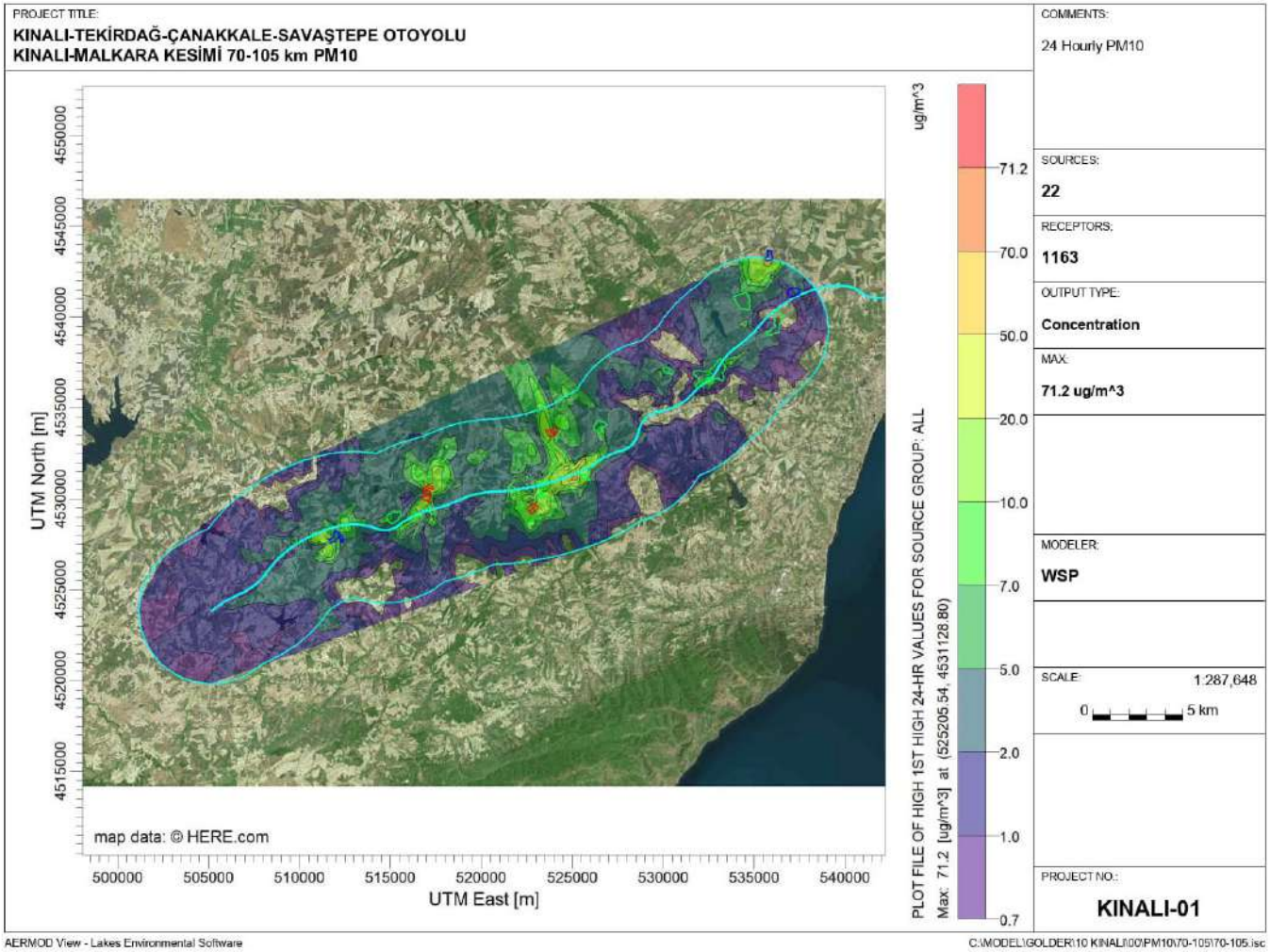



**Figure 14: Scenario-3 - Dispersion Map of PM10 - 24 hourly**

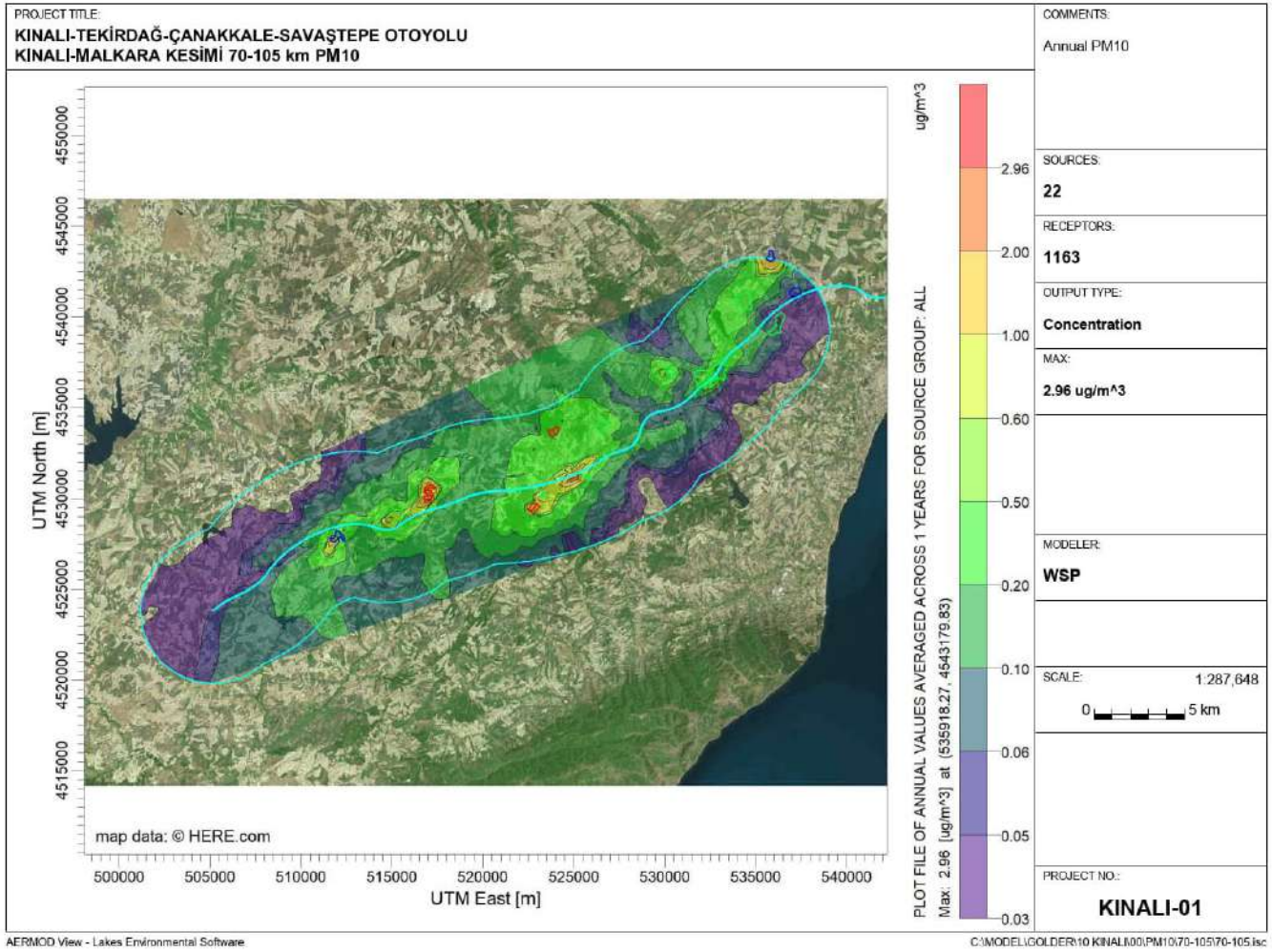



**Figure 15: Scenario-3 - Dispersion Map of PM10 - Yearly**

## Scenario-4 – Study Area-5 and Study Area-6 – Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ DANAMANDIRA P10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 29.83826 | ug/m^3 | 605446.60 | 4574671.82 | 218.10 | 0.00 | 220.00 | 11.03.2015, 24 |
| 24-HR | 35TH | 6.87873 | ug/m^3 | 605765.35 | 4575569.81 | 182.60 | 0.00 | 182.60 | 21.09.2015, 24 |
| ANNUAL | | 2.46282 | ug/m^3 | 605850.00 | 4574358.00 | 211.60 | 0.00 | 226.00 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.03013 | g/m^2 | 605765.35 | 4575569.81 | 182.60 | 0.00 | 182.60 | |
| 24-HR | 35TH | 0.01796 | g/m^2 | 605765.35 | 4575569.81 | 182.60 | 0.00 | 182.60 | |
| ANNUAL | | 2.09917 | g/m^2 | 605850.00 | 4574358.00 | 211.60 | 0.00 | 226.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM10\DANAMANDIRA\DANAMANDIRA.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 16: Scenario-4 Modelling Results for Settled Dust and PM10**

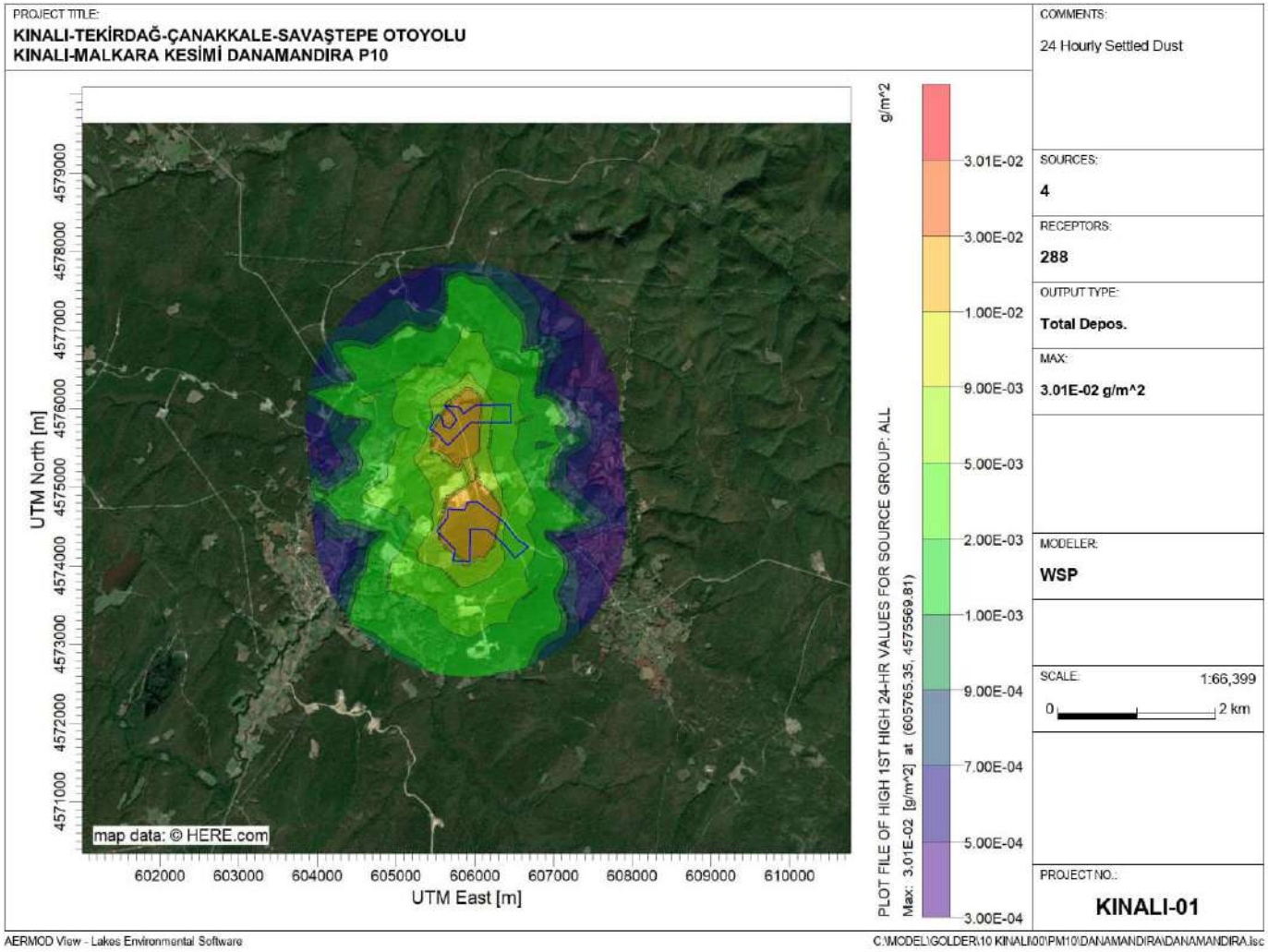



**Figure 17: Scenario-4 - Dispersion Map of Settled Dust - 24 hourly**

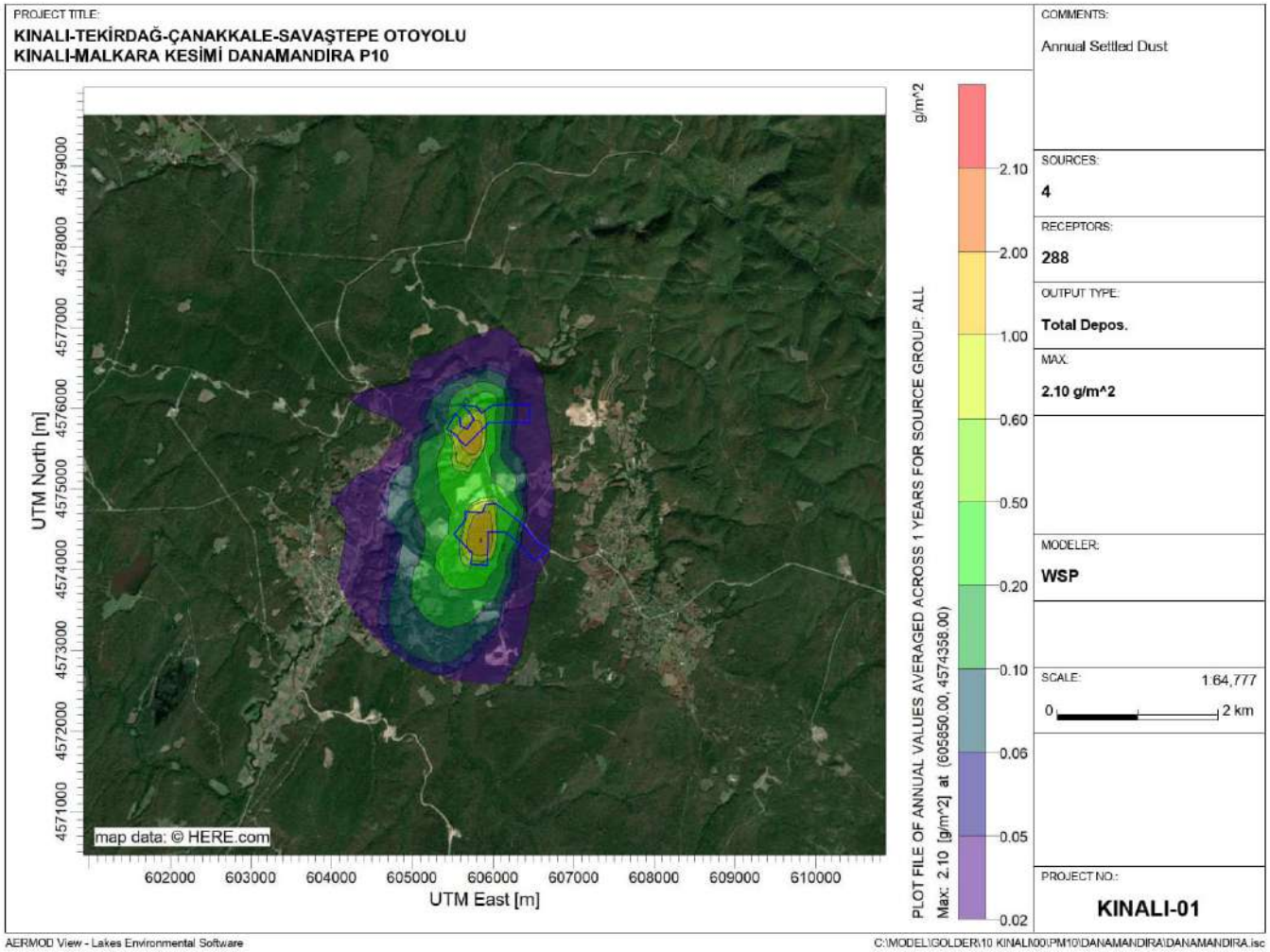



**Figure 18: Scenario-4 - Dispersion Map of Settled Dust - Yearly**

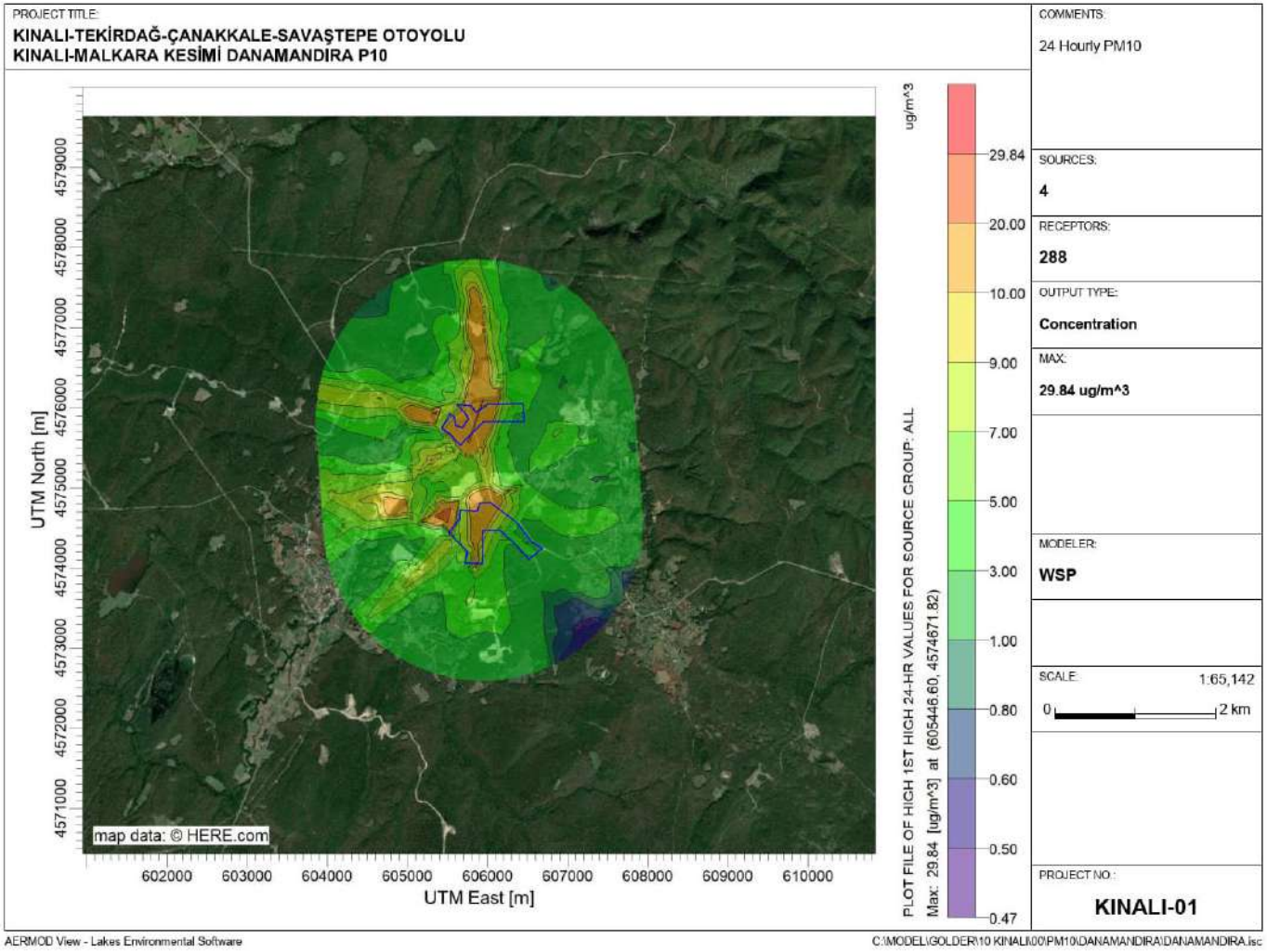



**Figure 19: Scenario-4 - Dispersion Map of PM10 - 24 hourly**

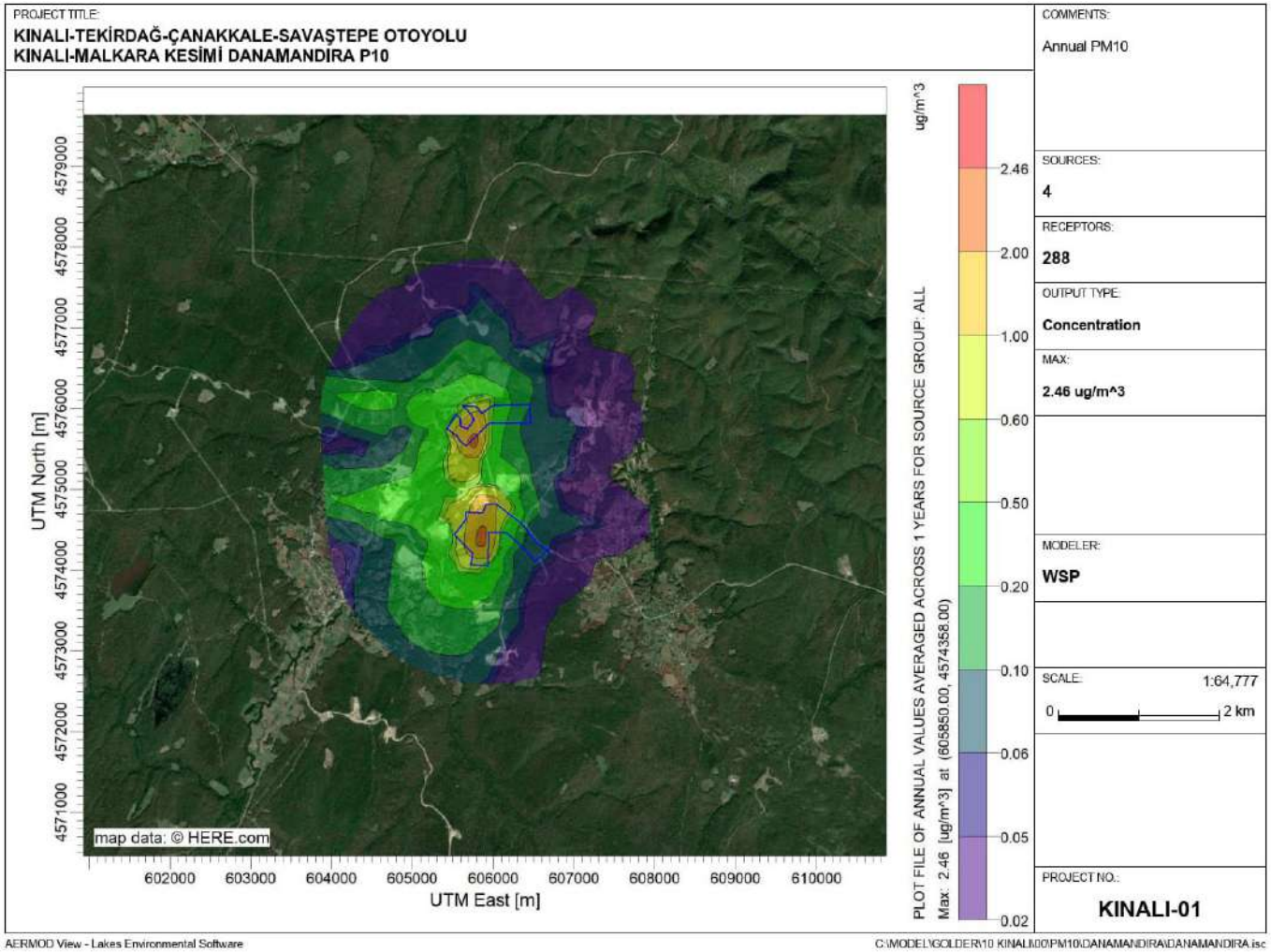



**Figure 20: Scenario-4 - Dispersion Map of PM10 - Yearly**

## Scenario-5 – Study Area-7 – Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ MURATLI PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 19.52318 | ug/m^3 | 540022.00 | 4555439.00 | 148.00 | 0.00 | 174.00 | 27.10.2020, 24 |
| 24-HR | 35TH | 0.92421 | ug/m^3 | 540088.99 | 4555689.00 | 138.20 | 0.00 | 160.00 | 1.06.2020, 24 |
| ANNUAL | | 0.32672 | ug/m^3 | 540052.15 | 4555610.01 | 147.10 | 0.00 | 159.00 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.00370 | g/m^2 | 540200.61 | 4555055.98 | 157.10 | 0.00 | 161.00 | |
| 24-HR | 35TH | 0.00149 | g/m^2 | 540200.61 | 4555055.98 | 157.10 | 0.00 | 161.00 | |
| ANNUAL | | 0.12889 | g/m^2 | 540200.61 | 4555055.98 | 157.10 | 0.00 | 161.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM10\MURATLI\MURATLI.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 21: Scenario-5 Modelling Results for Settled Dust and PM10**

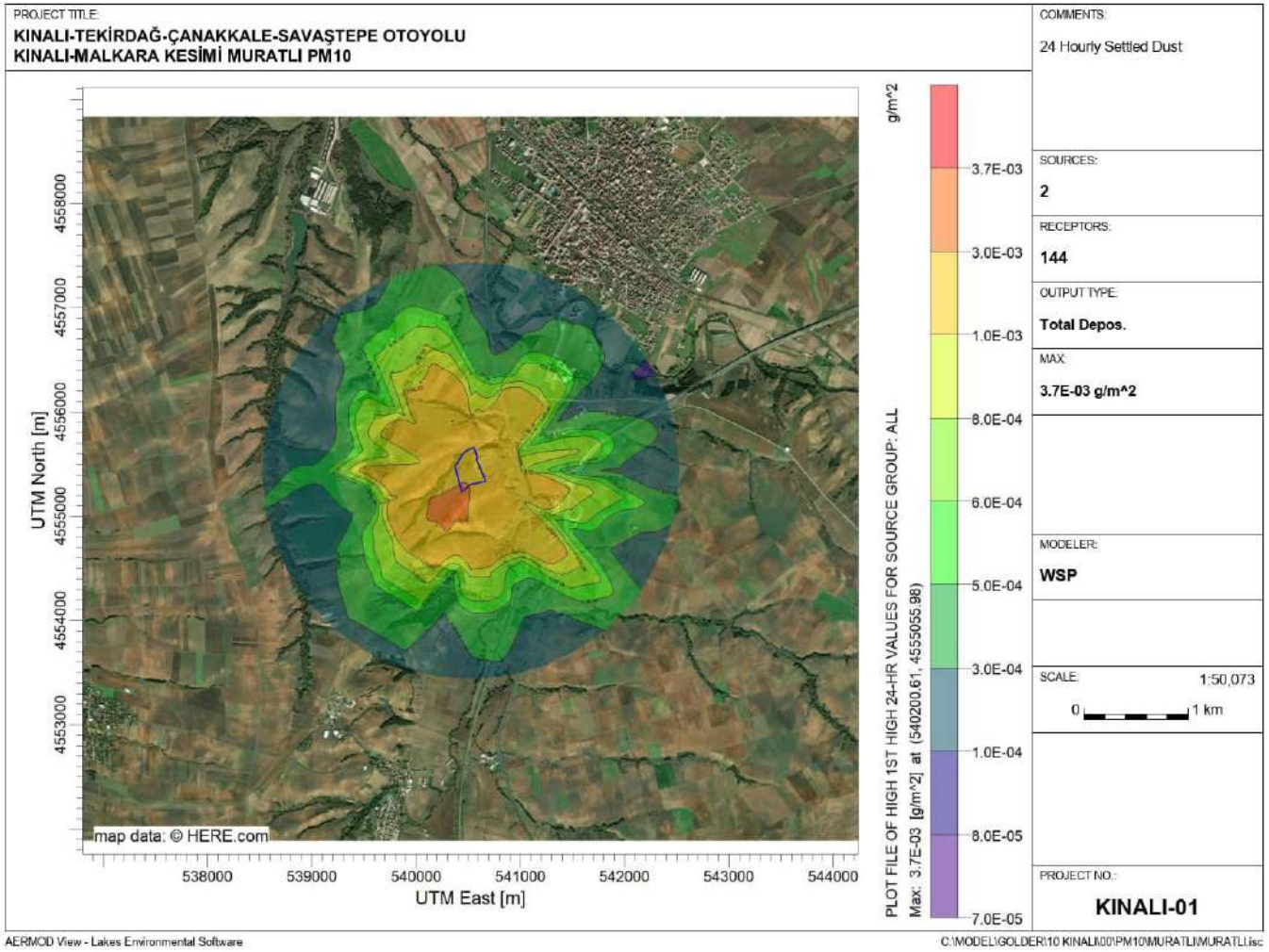



**Figure 22: Scenario-5 - Dispersion Map of Settled Dust - 24 hourly**

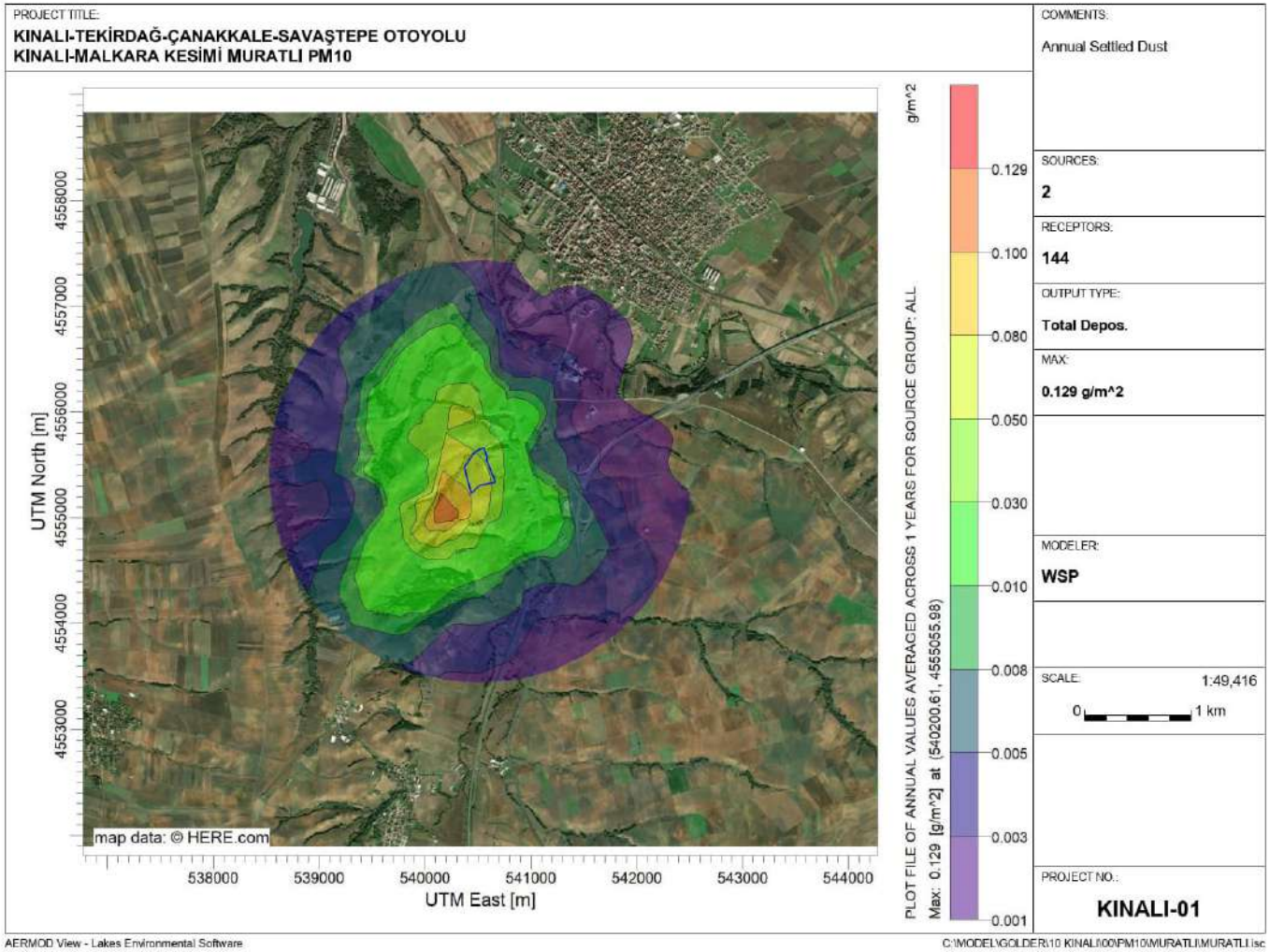



**Figure 23: Scenario-5 - Dispersion Map of Settled Dust - Yearly**

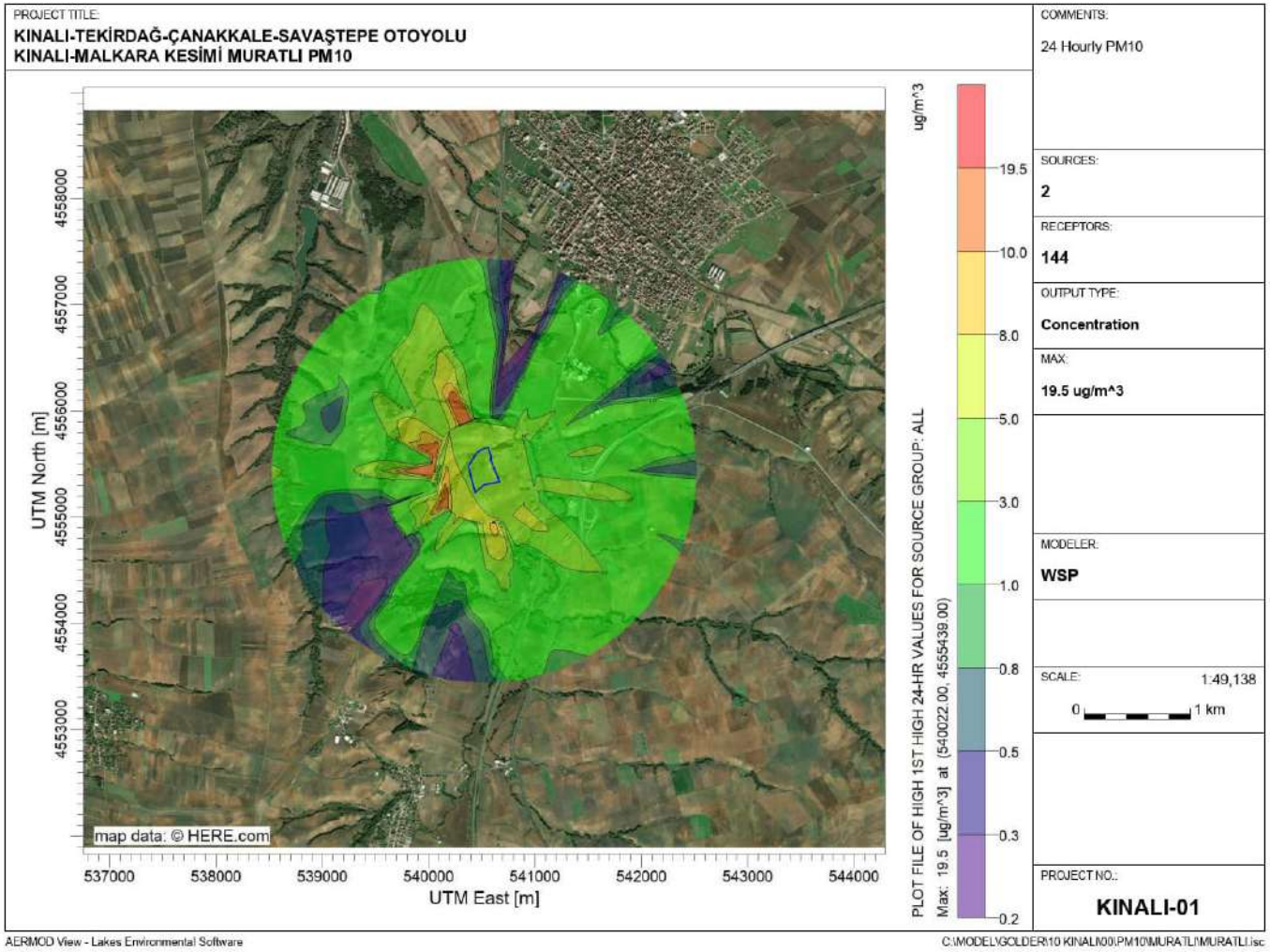



**Figure 24: Scenario-5 - Dispersion Map of PM10 - 24 hourly**

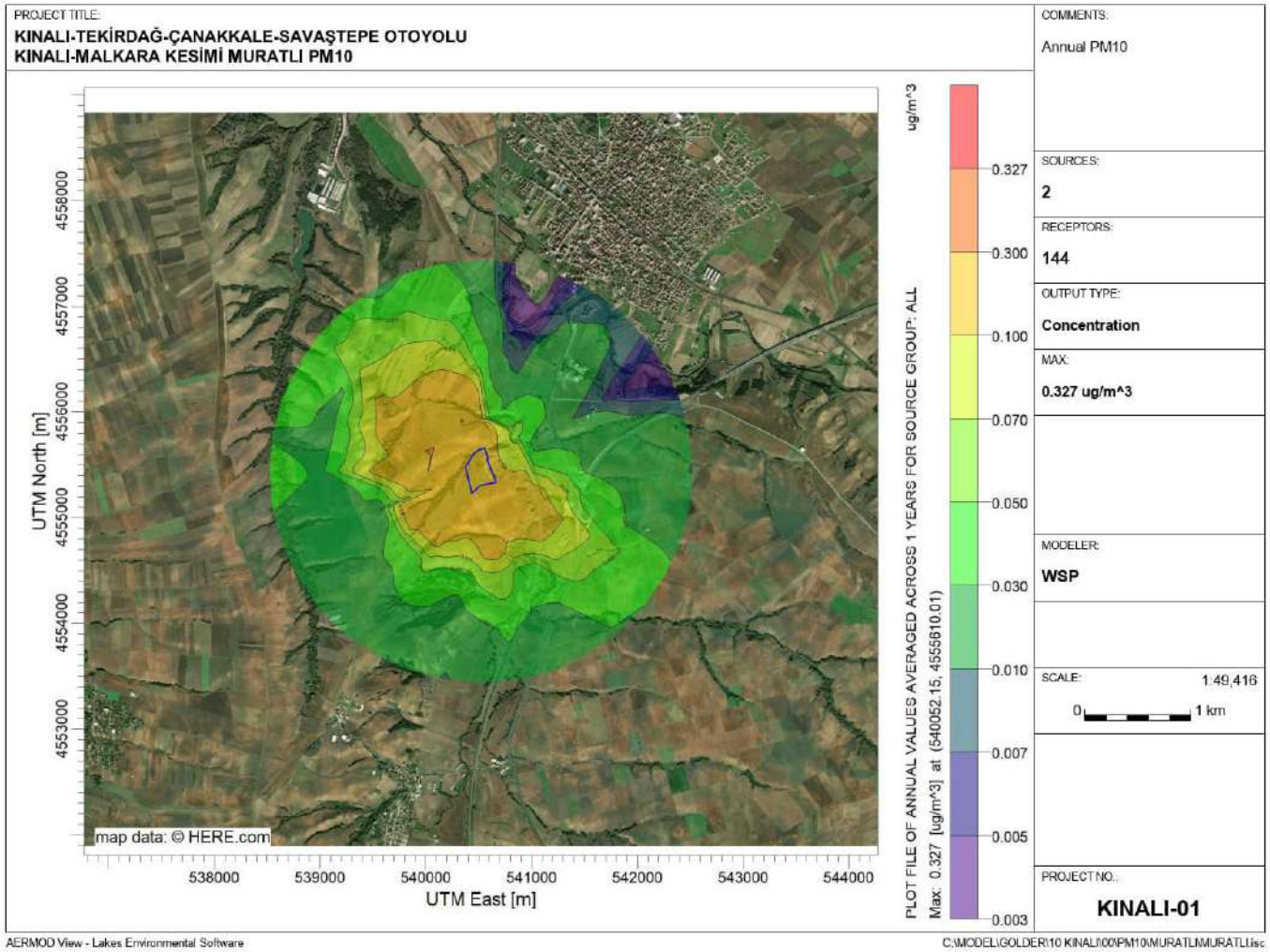



**Figure 25: Scenario-5 - Dispersion Map of PM10 - Yearly**

## Scenario-6 – Study Area-8 – Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ TEPEKOY PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 20.78518 | ug/m^3 | 514038.60 | 4503781.82 | 485.40 | 0.00 | 689.00 | 1.03.2021, 24 |
| 24-HR | 35TH | 3.58207 | ug/m^3 | 514209.61 | 4503311.98 | 486.40 | 0.00 | 689.00 | 4.06.2021, 24 |
| ANNUAL | | 1.24123 | ug/m^3 | 514147.98 | 4503373.61 | 490.40 | 0.00 | 689.00 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.00609 | g/m^2 | 514914.02 | 4504016.39 | 654.50 | 0.00 | 689.00 | |
| 24-HR | 35TH | 0.00283 | g/m^2 | 514147.98 | 4503373.61 | 490.40 | 0.00 | 689.00 | |
| ANNUAL | | 0.32144 | g/m^2 | 514147.98 | 4503373.61 | 490.40 | 0.00 | 689.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM10\TEPEKOY\TEPEKOY.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 26: Scenario-6 Modelling Results for Settled Dust and PM10**

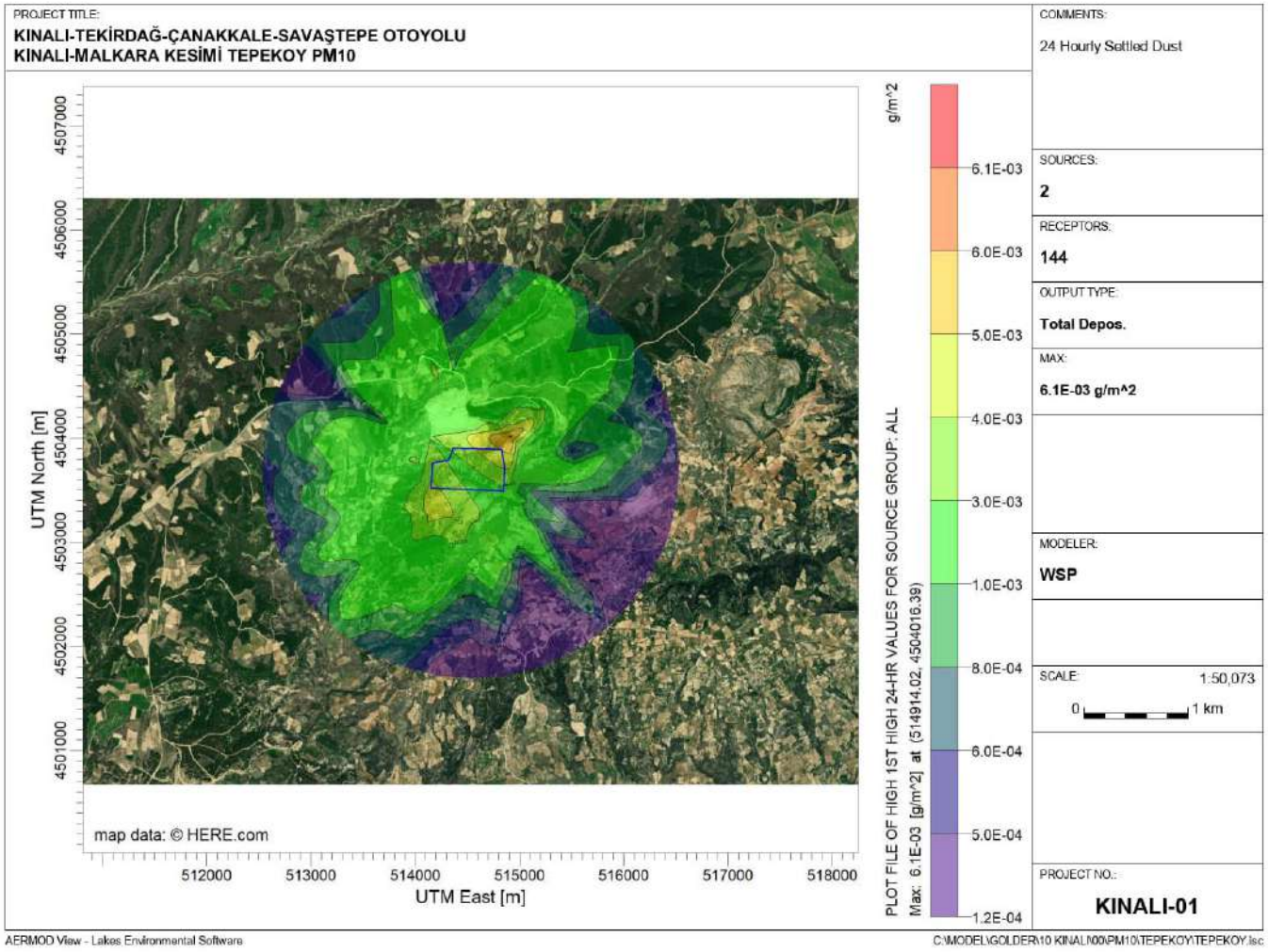



**Figure 27: Scenario-6 - Dispersion Map of Settled Dust - 24 hourly**

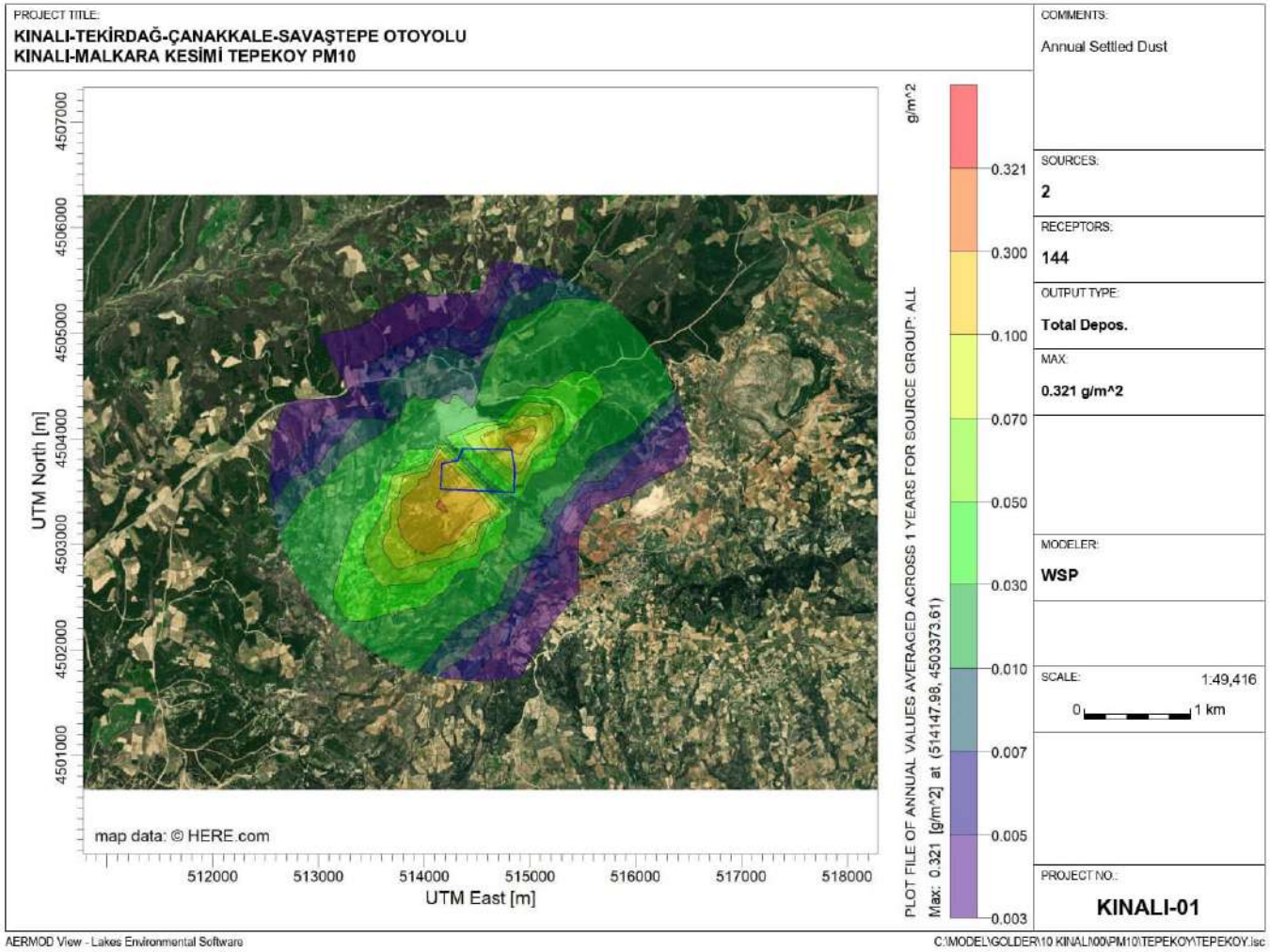



**Figure 28: Scenario-6 - Dispersion Map of Settled Dust - Yearly**

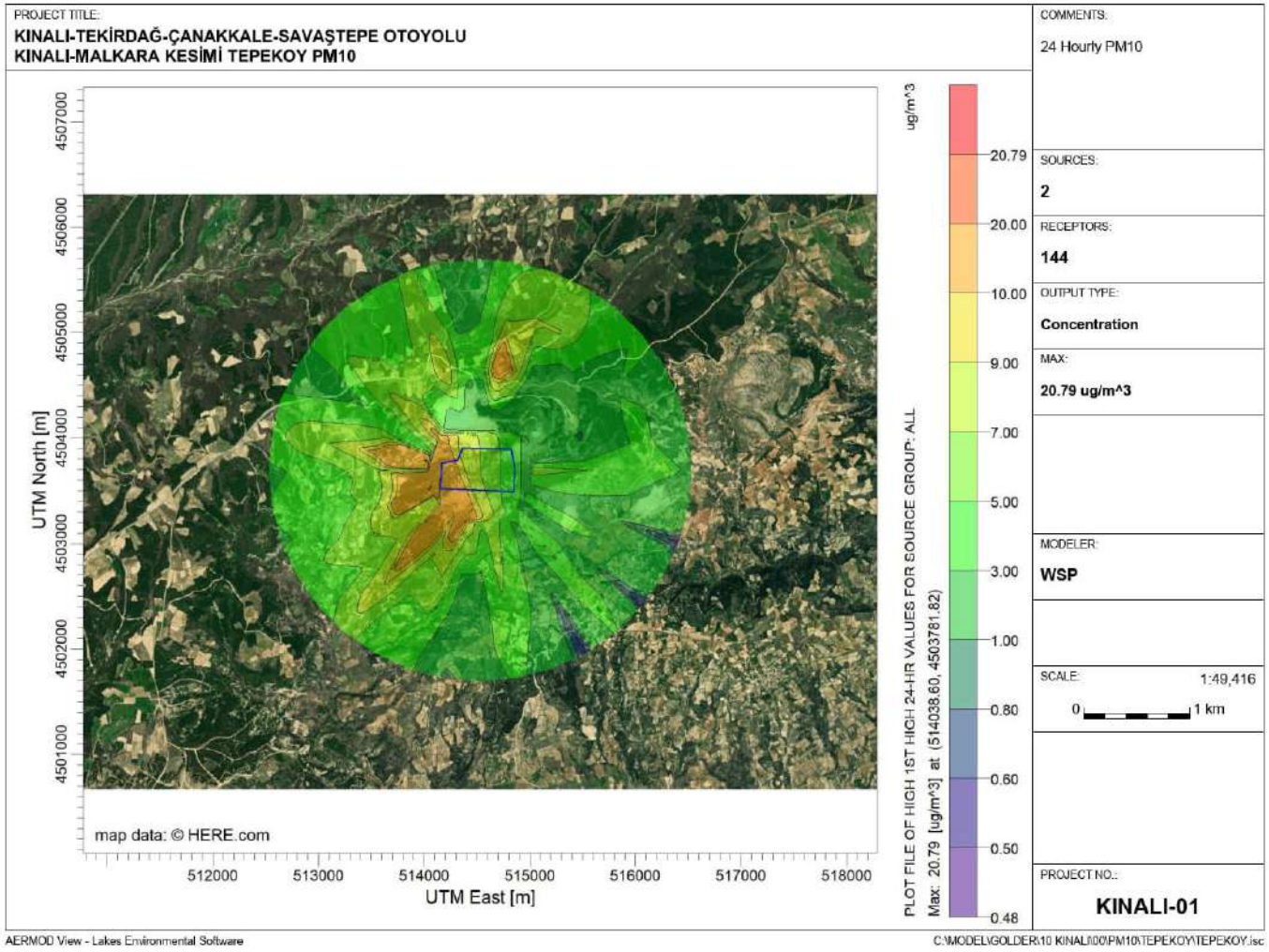



**Figure 29: Scenario-6 - Dispersion Map of PM10 - 24 hourly**

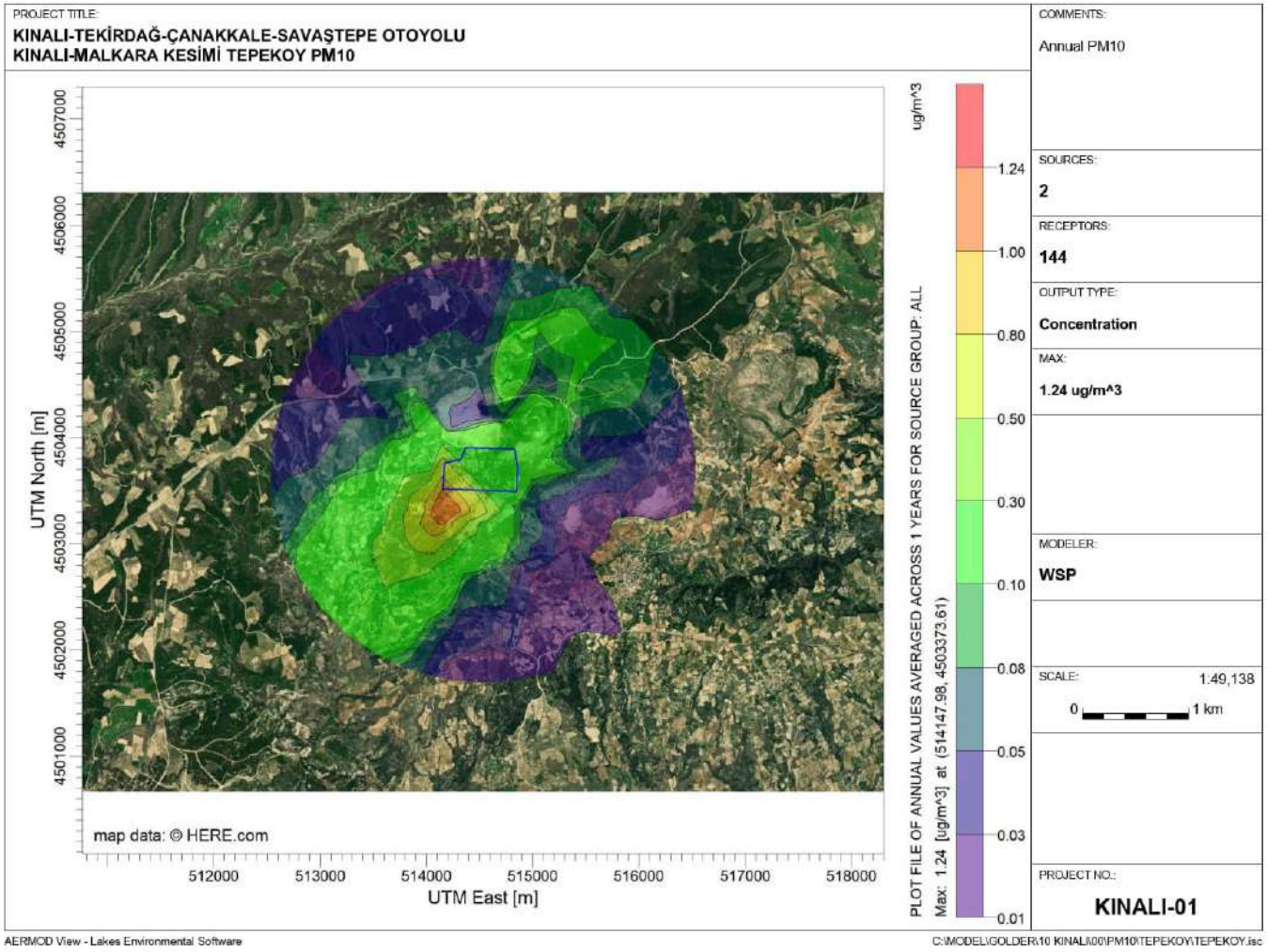



**Figure 30: Scenario-6 - Dispersion Map of PM10 - Yearly**

## Scenario-1 – Study Area-1 and Study Area-2 – Cumulative PM2.5

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ 0-35 km PM2.5

**PM2.5 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 9.84153 | ug/m^3 | 590825.60 | 4557762.18 | 166.80 | 0.00 | 171.00 | 10.11.2015, 24 |
| ANNUAL | | 0.91615 | ug/m^3 | 584229.52 | 4547374.07 | 67.41 | 0.00 | 67.41 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM25\0-35\0-35.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 31: Scenario-1 Modelling Results for Cumulative PM2.5**

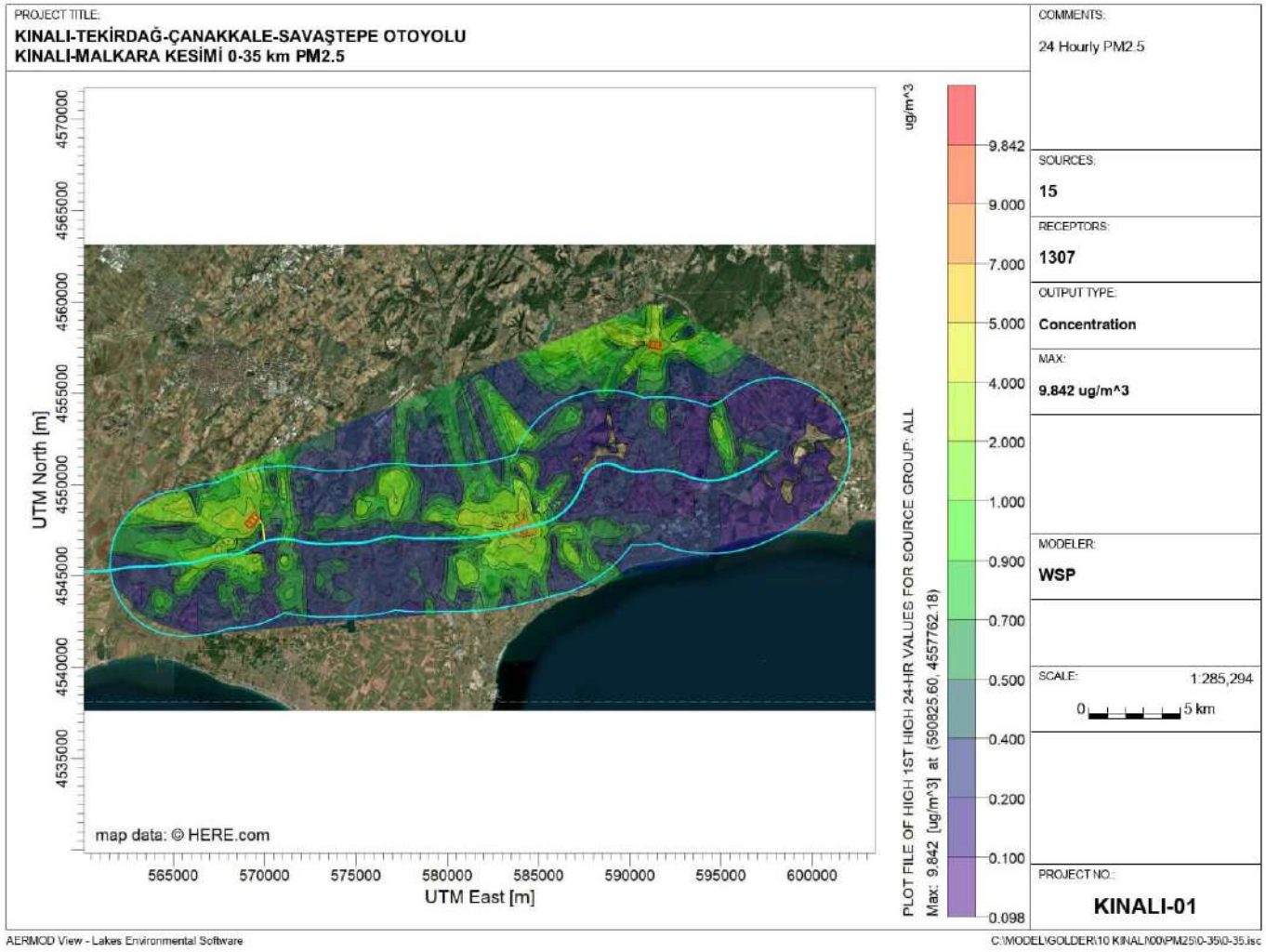



**Figure 32: Scenario-1 - Dispersion Map of Cumulative PM2.5 - 24 hourly**

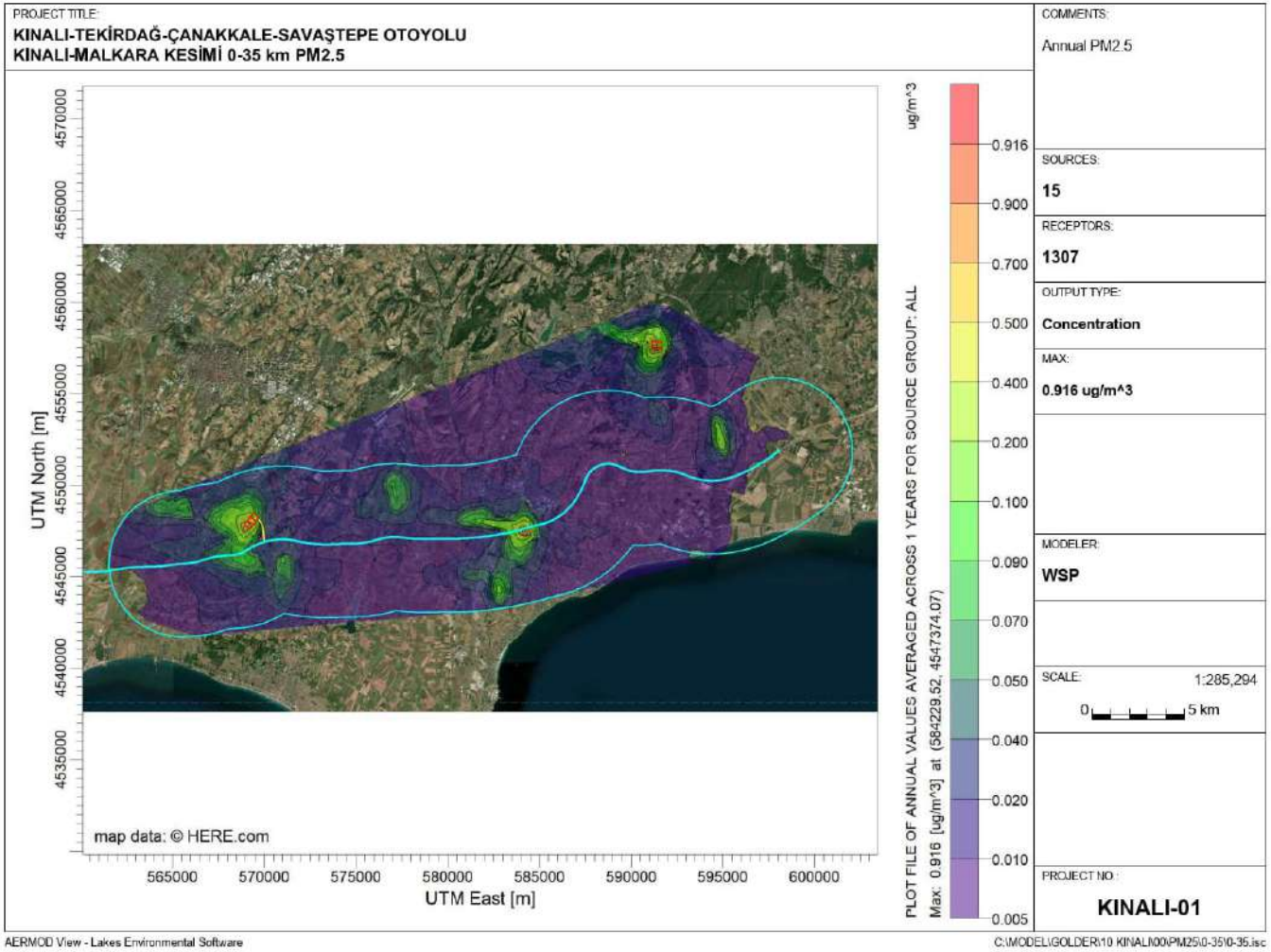



**Figure 33: Scenario-1 - Dispersion Map of Cumulative PM2.5 - Yearly**

## Scenario-2 – Study Area-3 – PM2.5

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ 35-70 km PM2.5

**PM2.5 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 3.85157 | ug/m^3 | 536296.42 | 4542847.23 | 217.48 | 0.00 | 257.00 | 29.10.2020, 24 |
| ANNUAL | | 0.17079 | ug/m^3 | 554116.84 | 4541960.93 | 100.31 | 0.00 | 100.31 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM25\35-70\35-70.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 34: Scenario-2 Modelling Results for PM2.5**

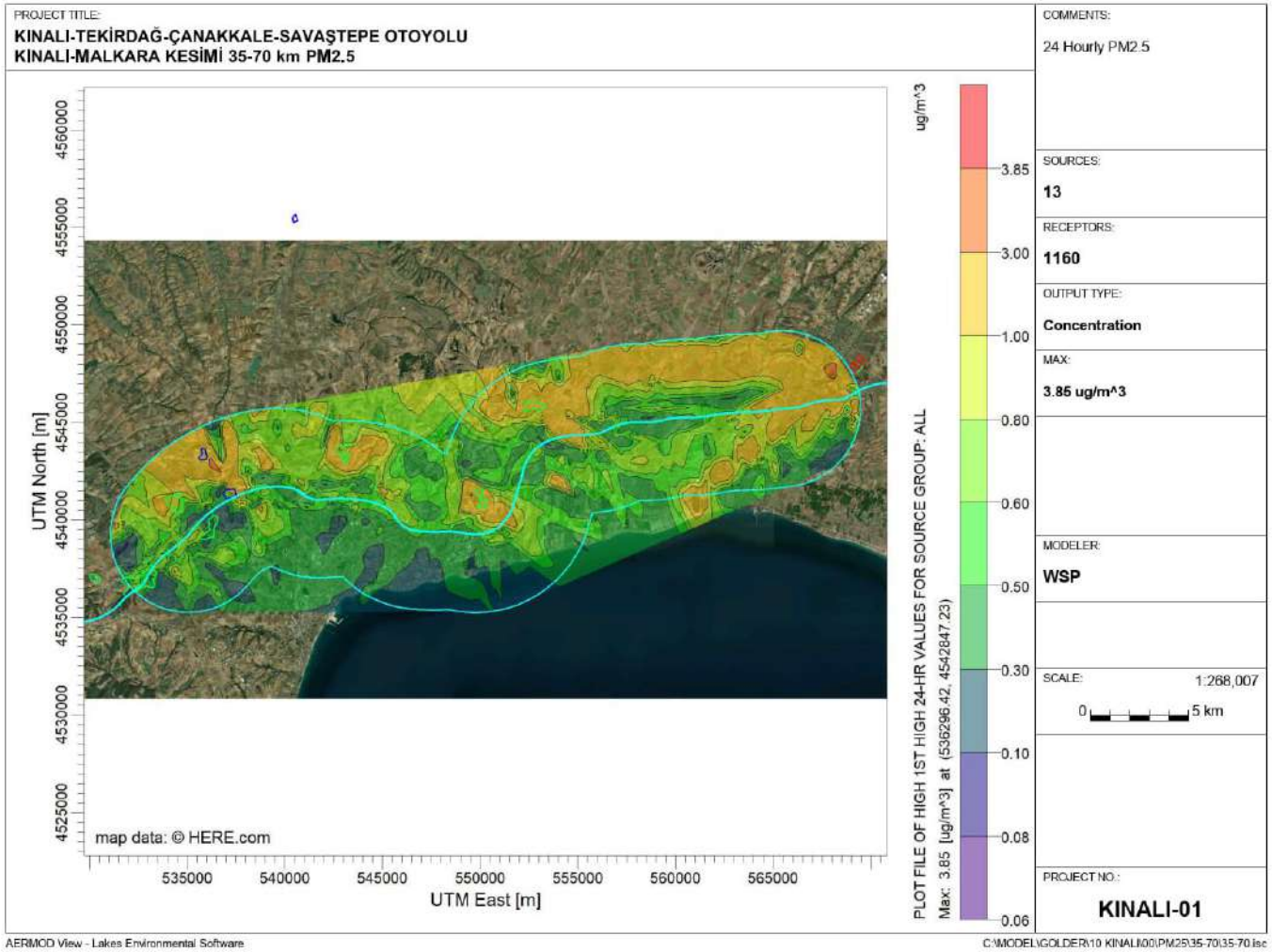



**Figure 35: Scenario-2 - Dispersion Map of PM2.5 - 24 hourly**

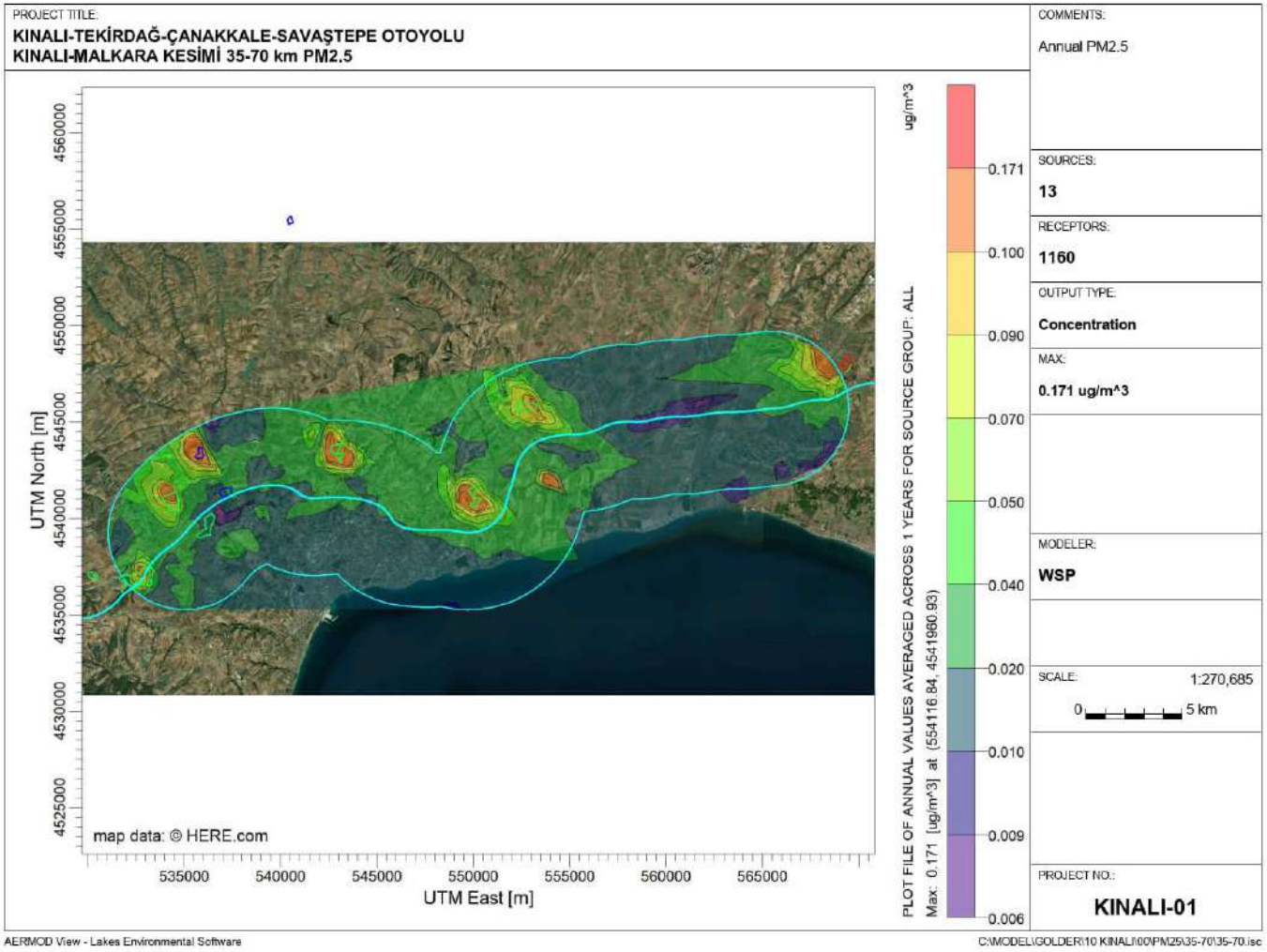



**Figure 36: Scenario-2 - Dispersion Map of PM2.5 - Yearly**

## Scenario-3 – Study Area-4 – PM2.5

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ 70-105 km PM2.5

**PM2.5 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 14.83685 | ug/m^3 | 525205.54 | 4531128.80 | 156.92 | 0.00 | 184.00 | 16.12.2021, 24 |
| ANNUAL | | 0.88165 | ug/m^3 | 535918.27 | 4543179.83 | 232.19 | 0.00 | 254.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM25\70-105\70-105.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 37: Scenario-3 Modelling Results for PM2.5**

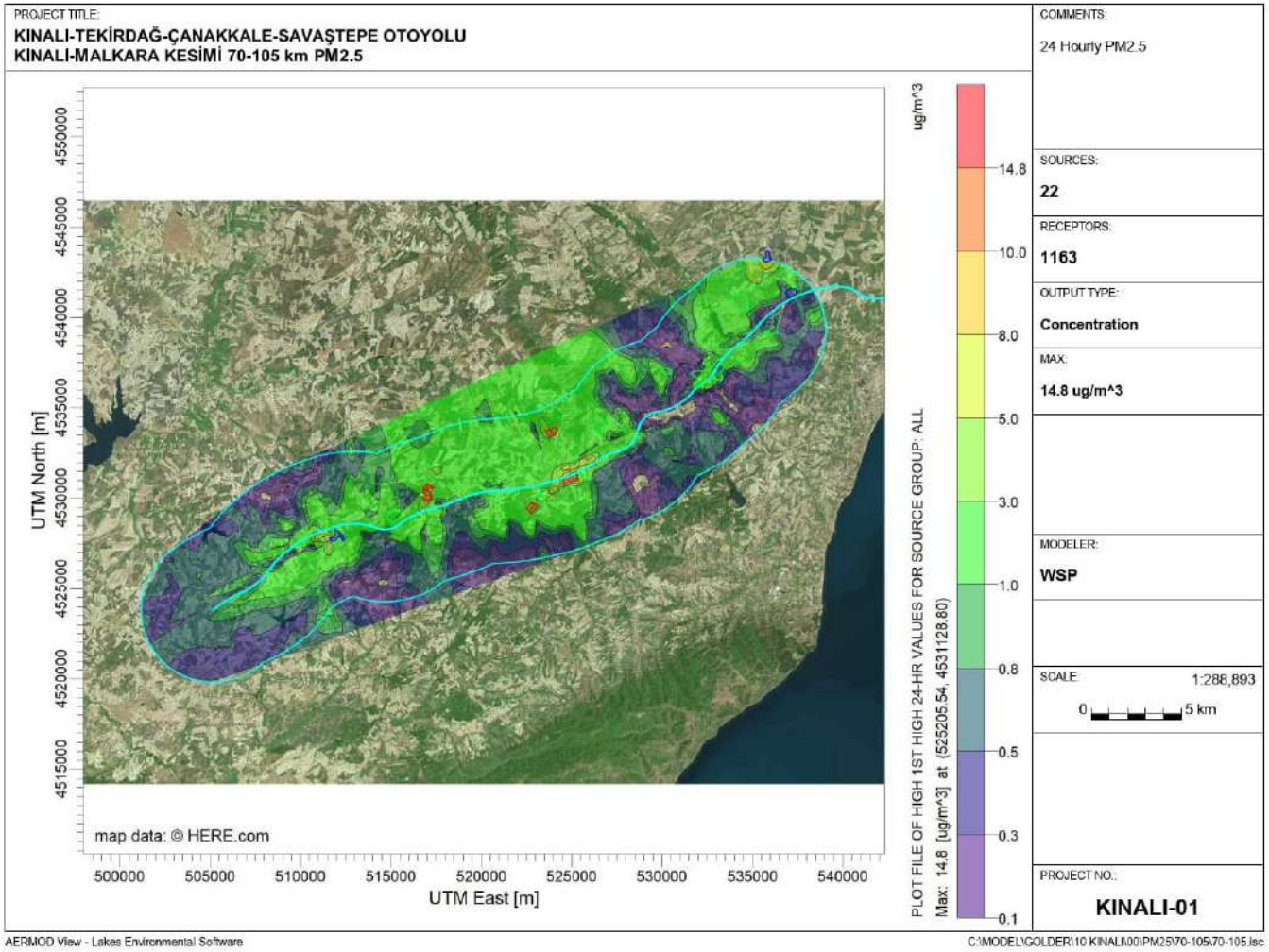



**Figure 38: Scenario-3 - Dispersion Map of PM2.5 - 24 hourly**

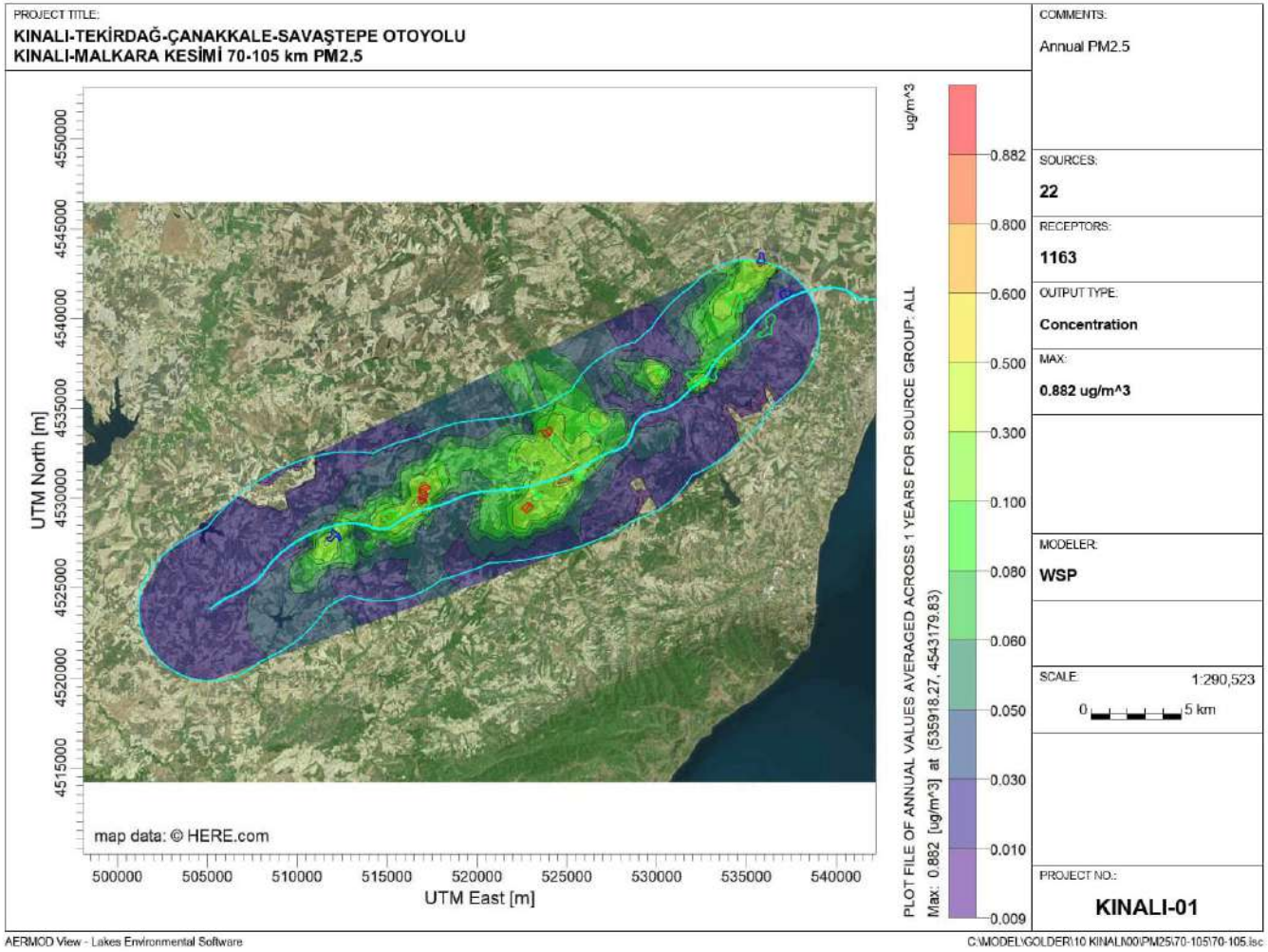



**Figure 39: Scenario-3 - Dispersion Map of PM2.5 - Yearly**

## Scenario-4 – Study Area-5 and Study Area-6 – Cumulative PM2.5

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ DANAMANDIRA PM2.5

**PM2.5 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 9.99498 | ug/m^3 | 605446.60 | 4574671.82 | 218.10 | 0.00 | 220.00 | 11.03.2015, 24 |
| ANNUAL | | 0.74913 | ug/m^3 | 605850.00 | 4574358.00 | 211.60 | 0.00 | 226.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM25\DANAMANDIRA\DANAMANDIRA.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 40: Scenario-4 Modelling Results for Cumulative PM2.5**

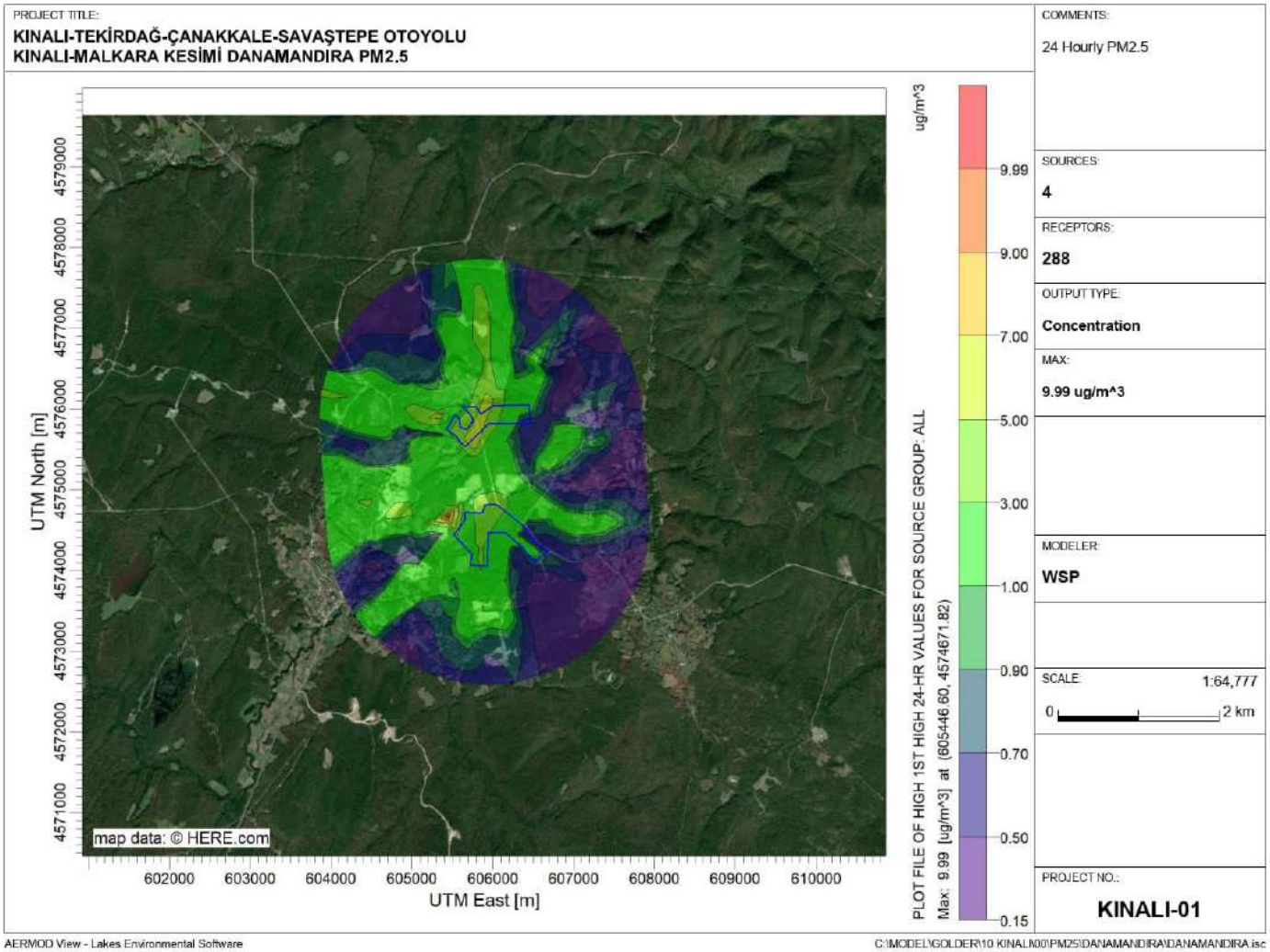



**Figure 41: Scenario-4 - Dispersion Map of Cumulative PM2.5 - 24 hourly**

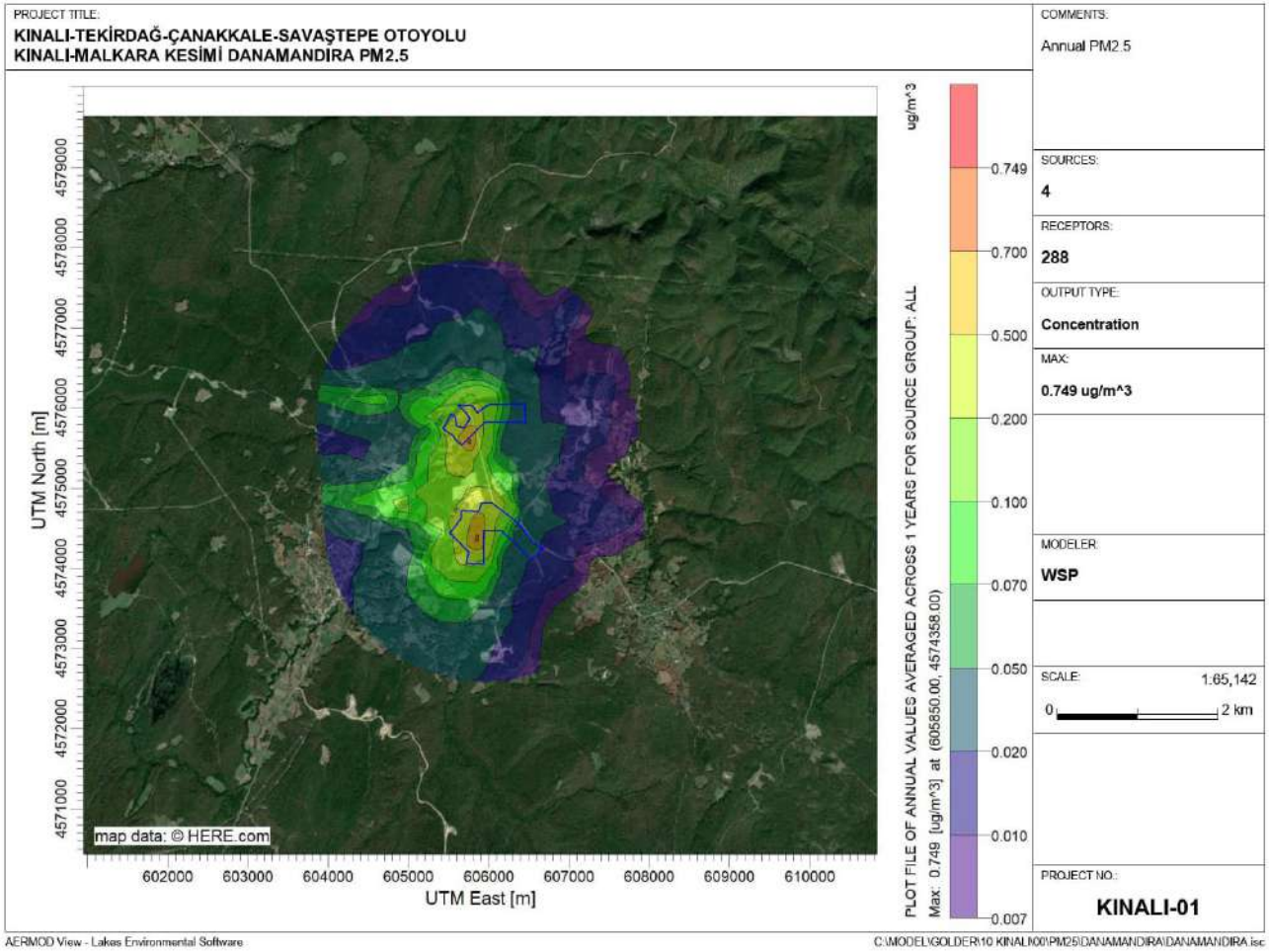



**Figure 42: Scenario-4 - Dispersion Map of Cumulative PM2.5 - Yearly**

## Scenario-5 – Study Area-7 – PM2.5

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ MURATLI PM2.5

**PM2.5 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 8.24582 | ug/m^3 | 540022.00 | 4555439.00 | 148.00 | 0.00 | 174.00 | 27.10.2020, 24 |
| ANNUAL | | 0.10487 | ug/m^3 | 540052.15 | 4555610.01 | 147.10 | 0.00 | 159.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM25\MURATLI\MURATLI.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 43: Scenario-5 Modelling Results for PM2.5**

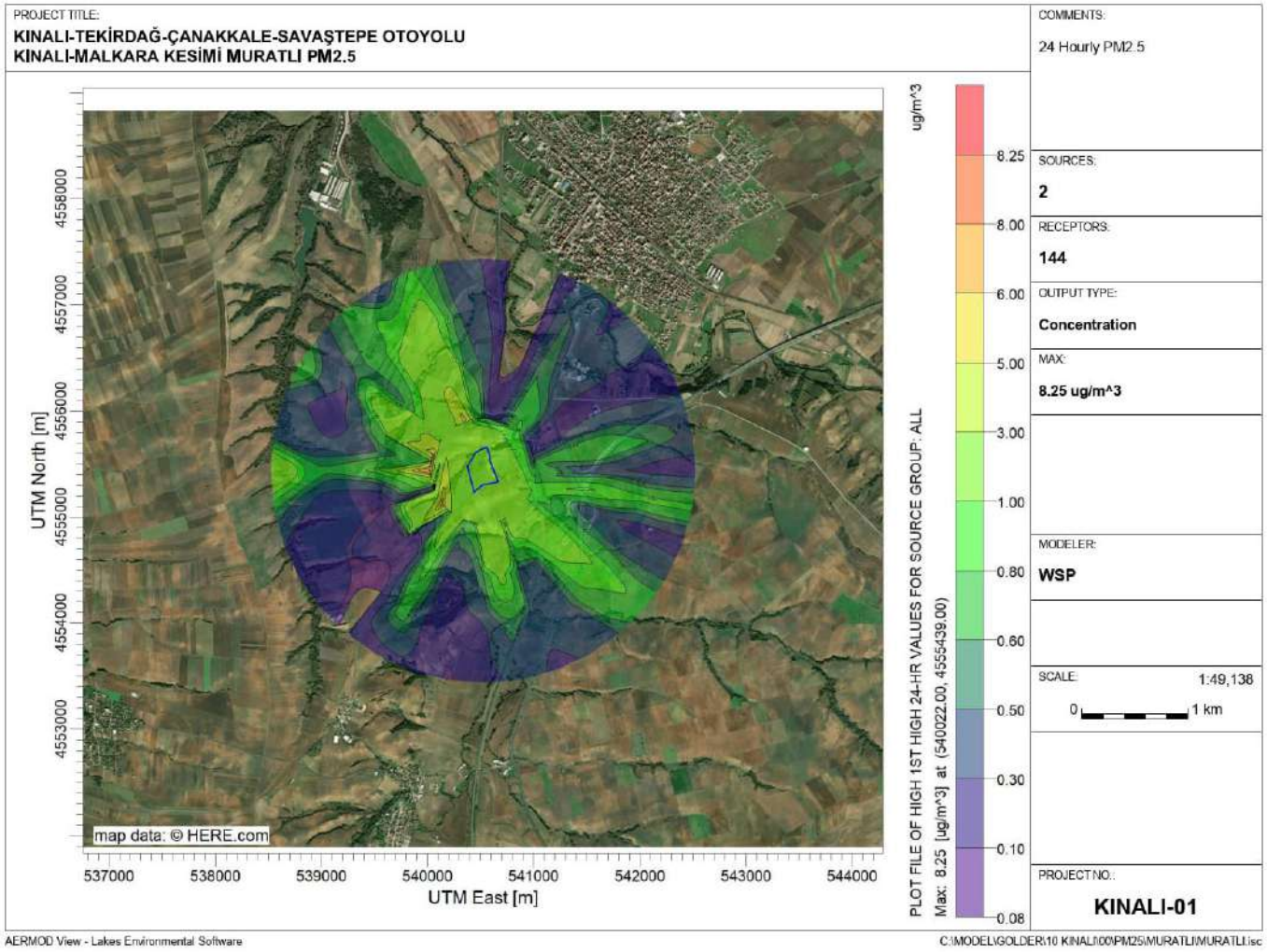



**Figure 44: Scenario-5 - Dispersion Map of PM2.5 - 24 hourly**

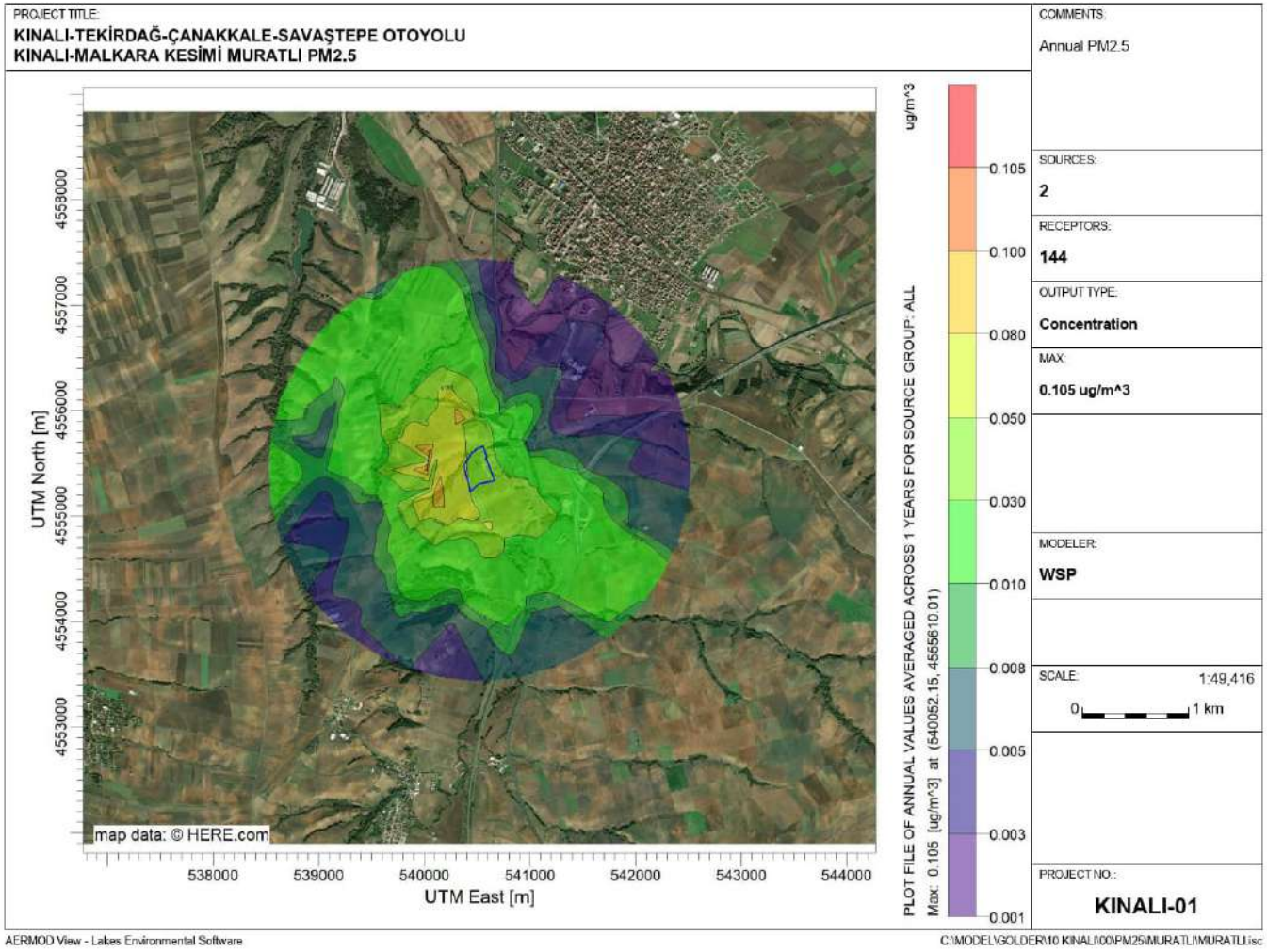



**Figure 45: Scenario-5 - Dispersion Map of PM2.5 - Yearly**

## Scenario-6 – Study Arear-8 – PM2.5

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU
KINALI-MALKARA KESİMİ TEPEKOY PM2.5

**PM2.5 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 7.36032 | ug/m^3 | 514061.15 | 4503523.99 | 487.40 | 0.00 | 689.00 | 3.11.2021, 24 |
| ANNUAL | | 0.36361 | ug/m^3 | 514147.98 | 4503373.61 | 490.40 | 0.00 | 689.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\PM25\TEPEKOY\TEPEKOY.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 25.06.2024

**Figure 46: Scenario-6 Modelling Results for PM2.5**

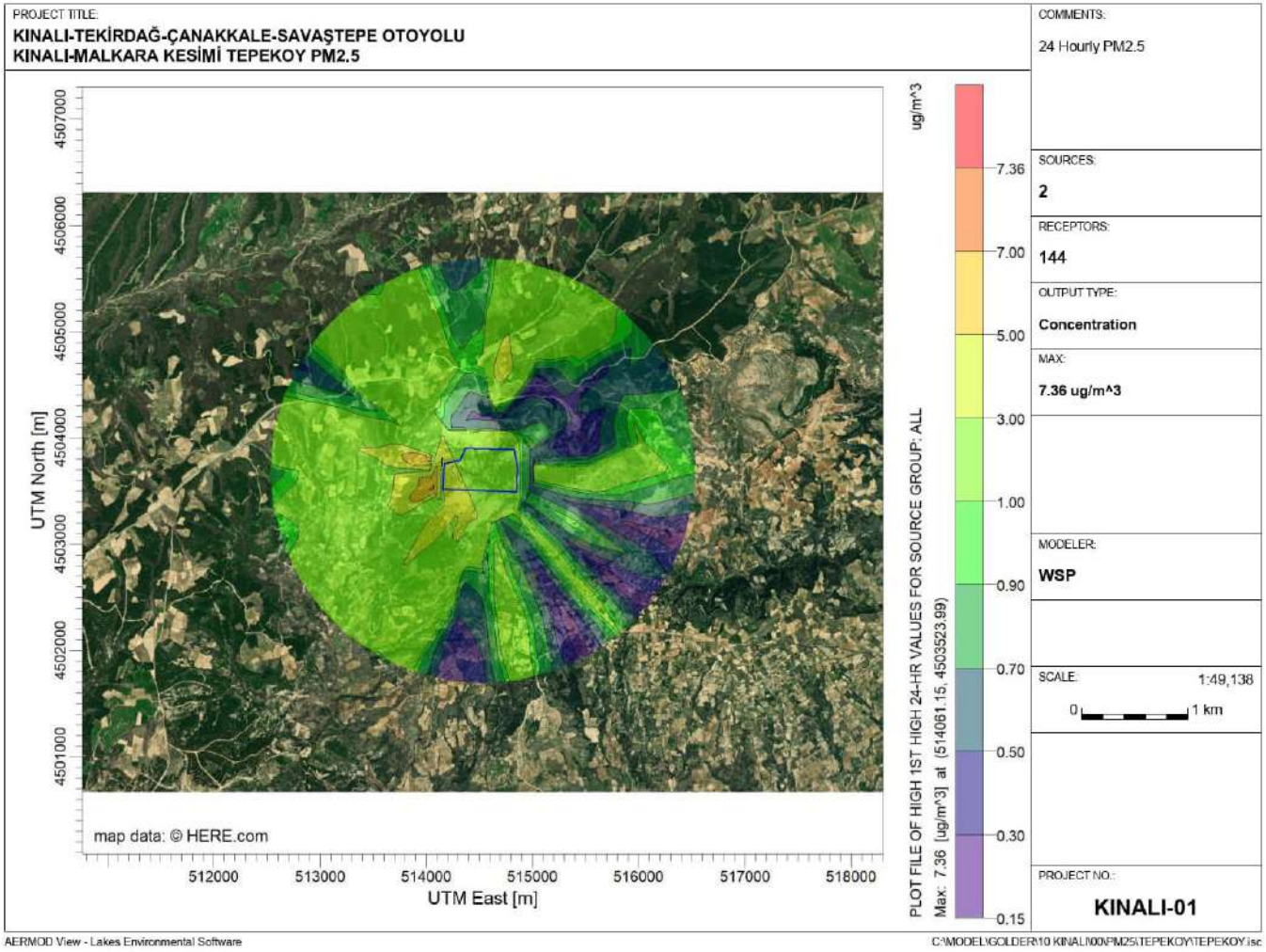



**Figure 47: Scenario-6 - Dispersion Map of PM2.5 - 24 hourly**

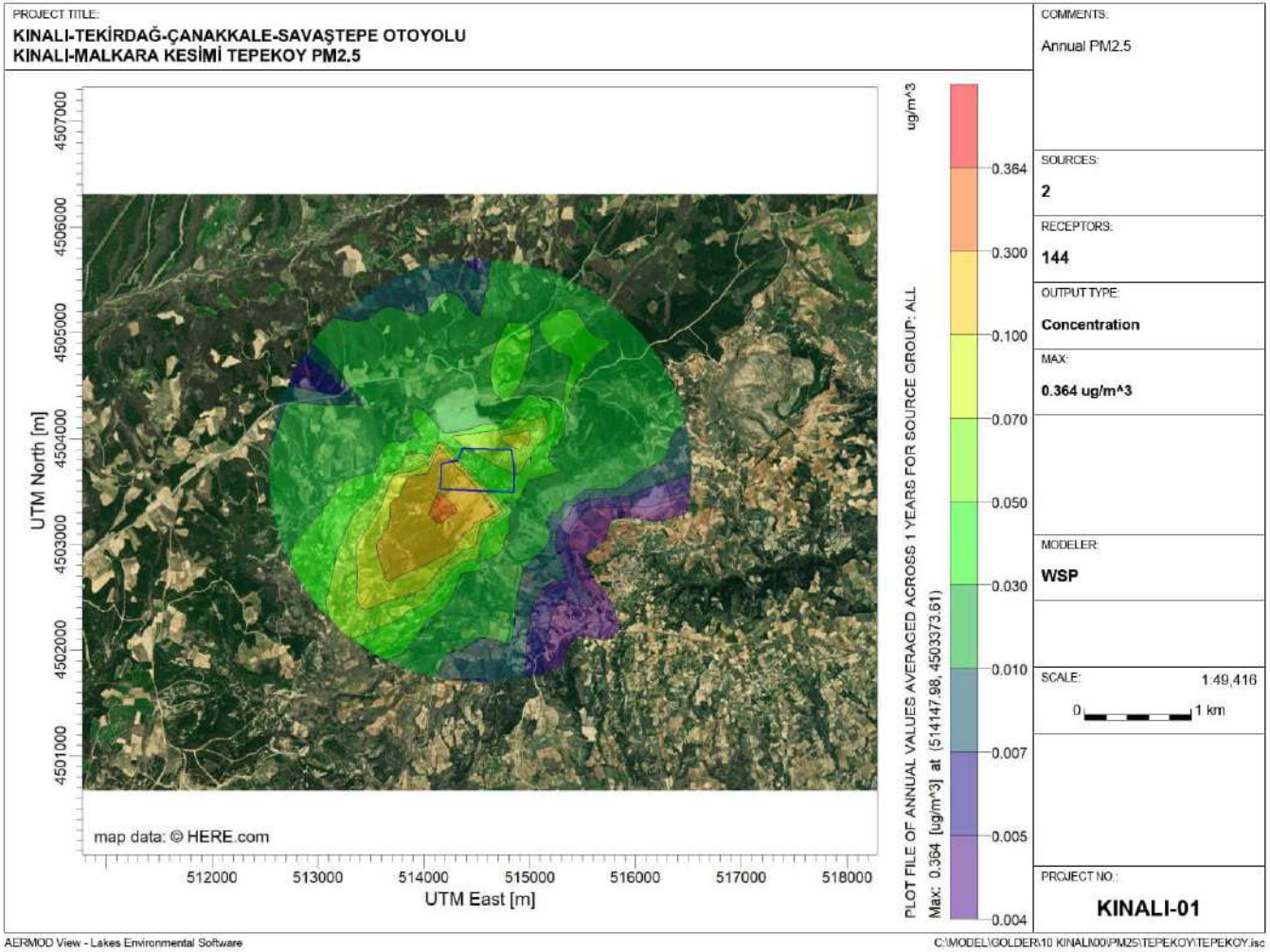



**Figure 48: Scenario-6 - Dispersion Map of PM2.5 - Yearly**

# OPERATION PHASE
## Scenario-7.a – Study Area-1 – Settled Dust and PM

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 0-35 km PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.22711 | ug/m^3 | 576265.77 | 4547304.28 | 76.67 | 0.00 | 76.67 | 25.09.2015, 24 |
| 24-HR | 35TH | 0.06503 | ug/m^3 | 576265.77 | 4547304.28 | 76.67 | 0.00 | 76.67 | 6.12.2015, 24 |
| ANNUAL | | 0.02121 | ug/m^3 | 592073.81 | 4550528.25 | 22.84 | 0.00 | 22.84 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.00002 | g/m^2 | 565569.78 | 4545461.42 | 19.33 | 0.00 | 19.33 | |
| 24-HR | 35TH | 0.00001 | g/m^2 | 565607.60 | 4545213.11 | 23.40 | 0.00 | 23.40 | |
| ANNUAL | | 0.00293 | g/m^2 | 585197.16 | 4547625.50 | 83.35 | 0.00 | 83.35 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\PM\0-35\0-35.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 49: Scenario-7.a Modelling Results for Settled Dust and PM10**

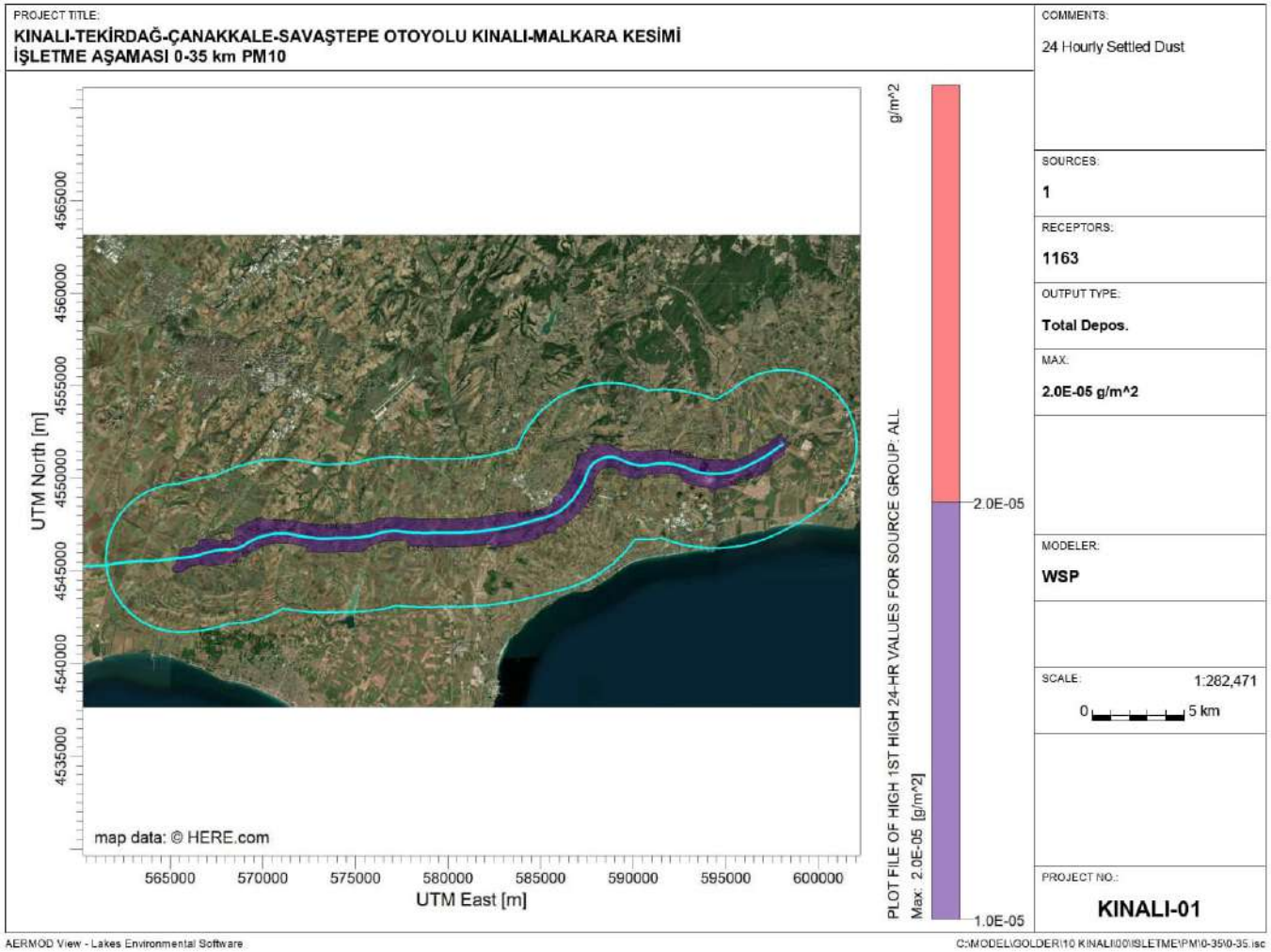



**Figure 50: Scenario-7.a - Dispersion Map of Settled Dust - 24 hourly**

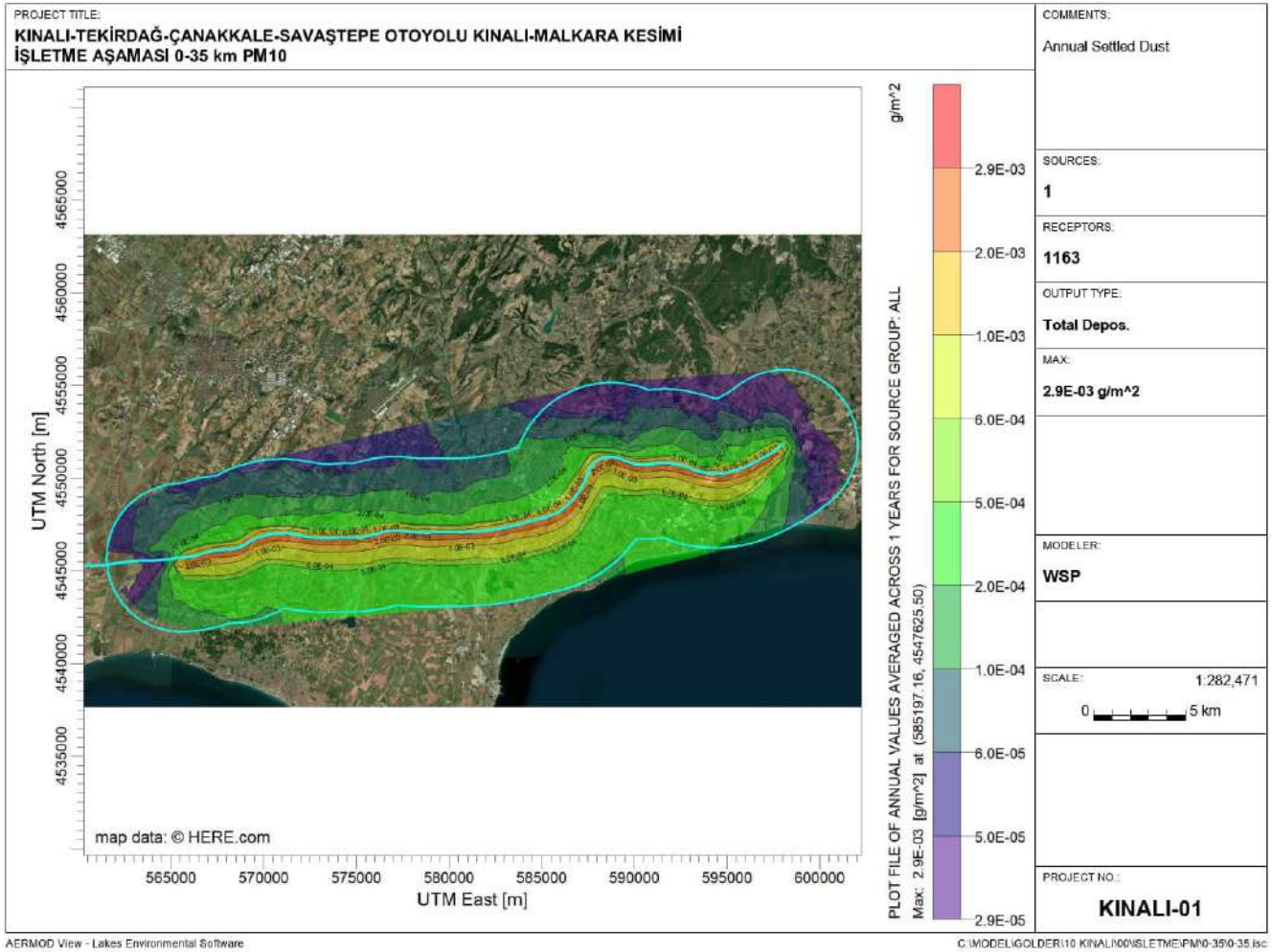



**Figure 51: Scenario-7.a - Dispersion Map of Settled Dust - Yearly**

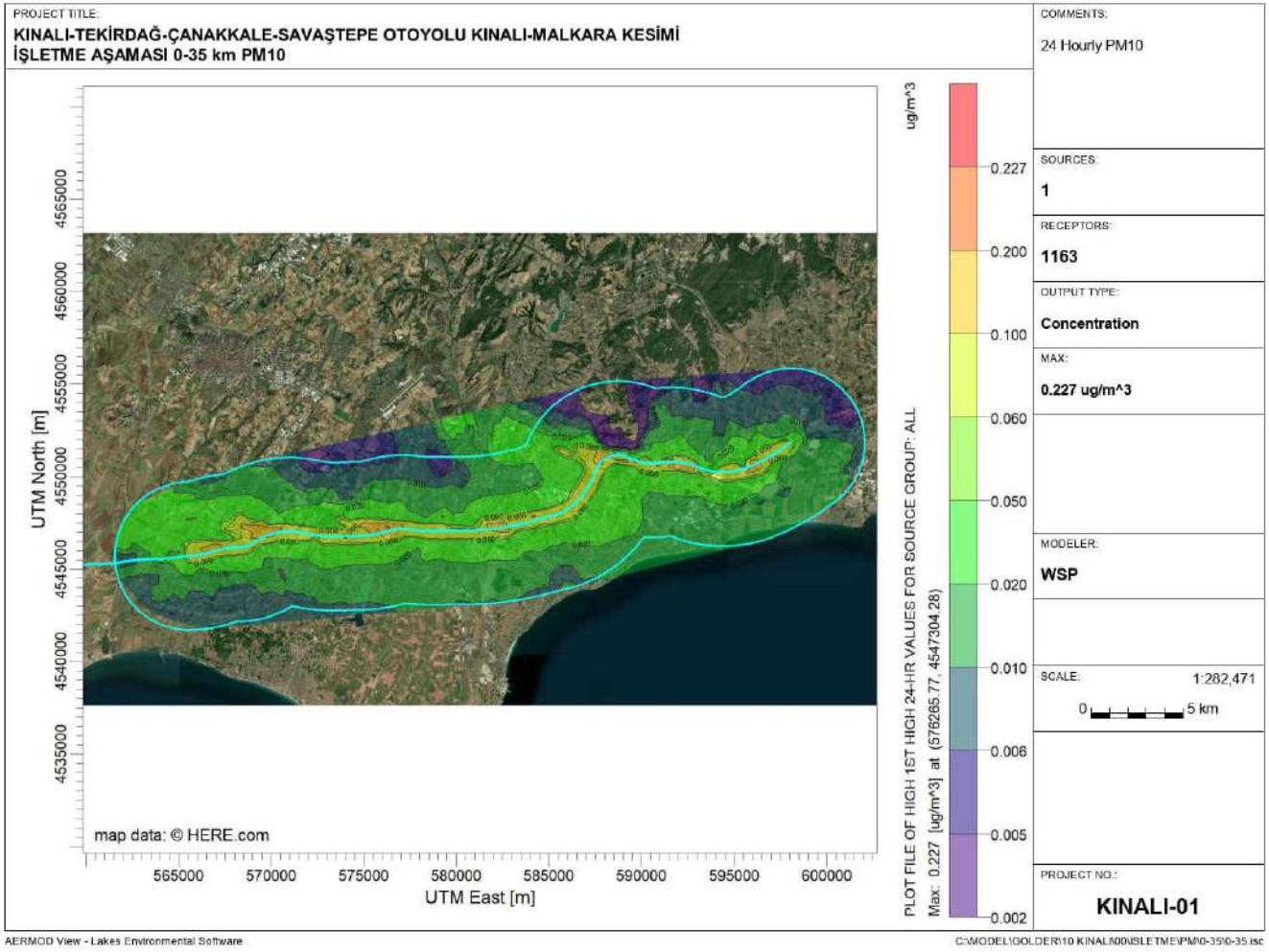



**Figure 52: Scenario-7.a - Dispersion Map of PM10 - 24 hourly**

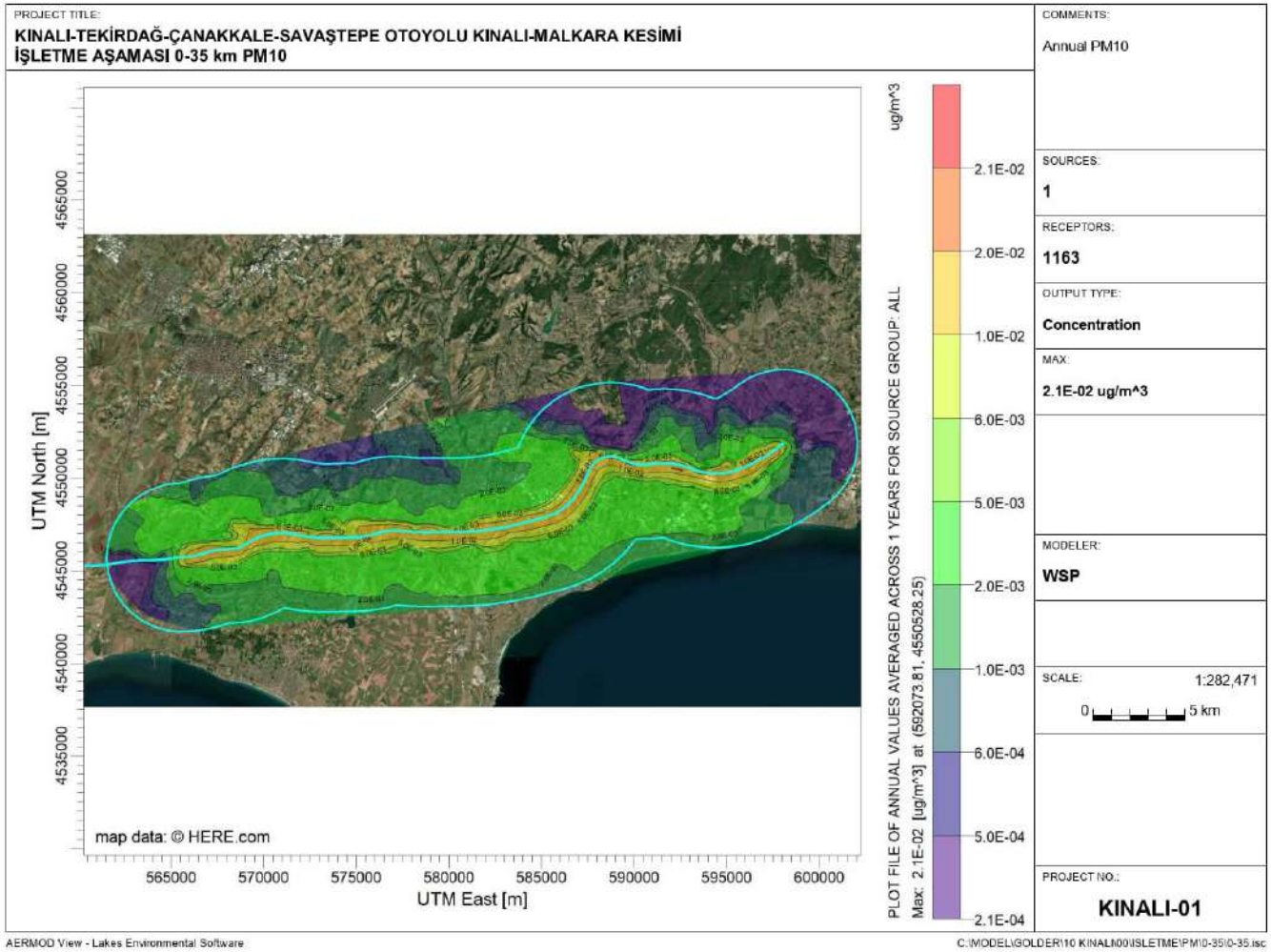



**Figure 53: Scenario-7.a - Dispersion Map of PM10 - Yearly**

# Scenario-8.a – Study Area-3 – Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 35-70 km PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.21460 | ug/m^3 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | 28.11.2020, 24 |
| 24-HR | 35TH | 0.11732 | ug/m^3 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | 29.10.2020, 24 |
| ANNUAL | | 0.06245 | ug/m^3 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.00002 | g/m^2 | 535582.78 | 4539487.69 | 220.50 | 0.00 | 220.50 | |
| 24-HR | 35TH | 0.00002 | g/m^2 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | |
| ANNUAL | | 0.00383 | g/m^2 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\PM\35-70\35-70.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 54: Scenario-8.a Modelling Results for Settled Dust and PM10**

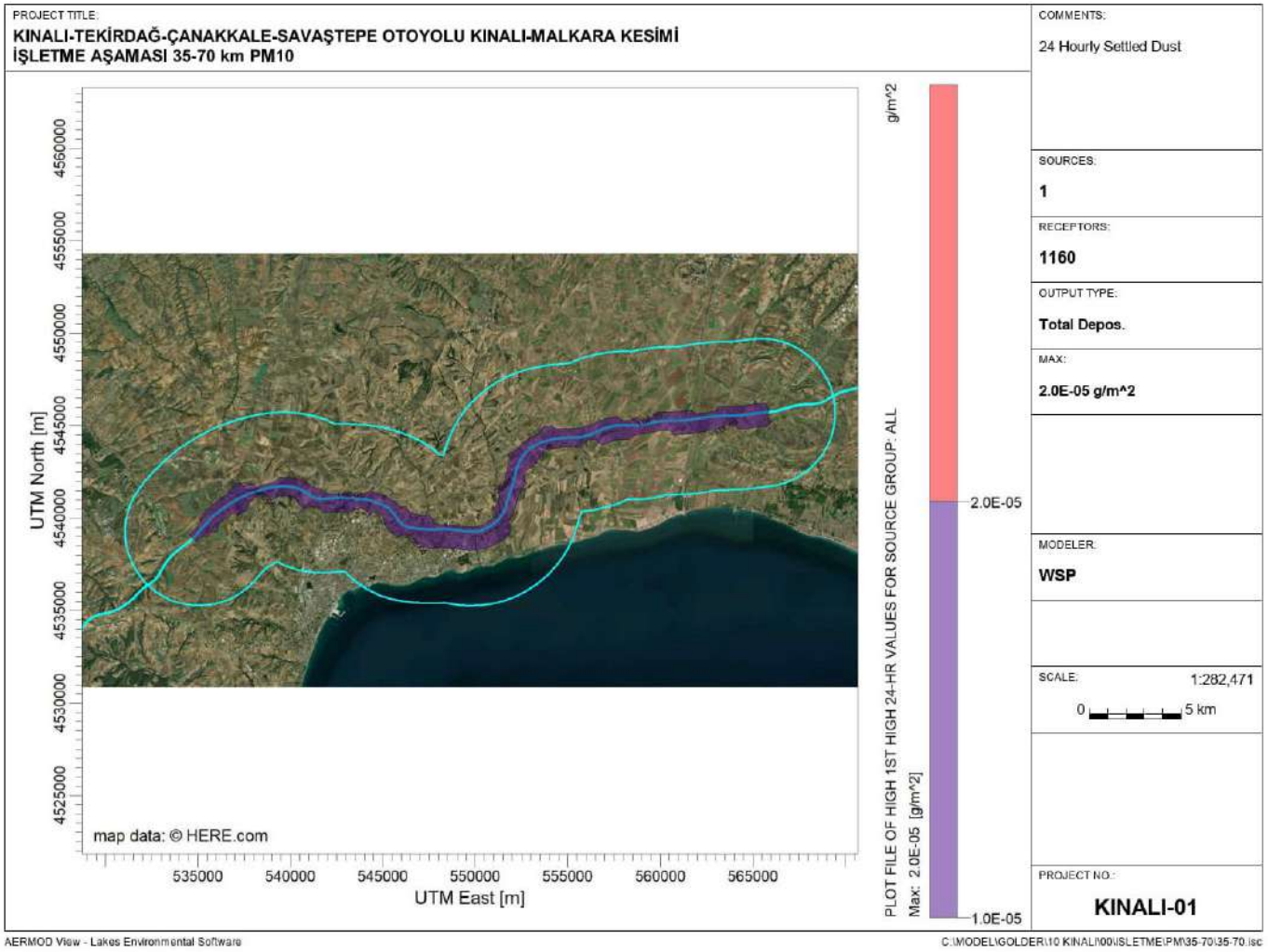



**Figure 55: Scenario-8.a - Dispersion Map of Settled Dust - 24 hourly**

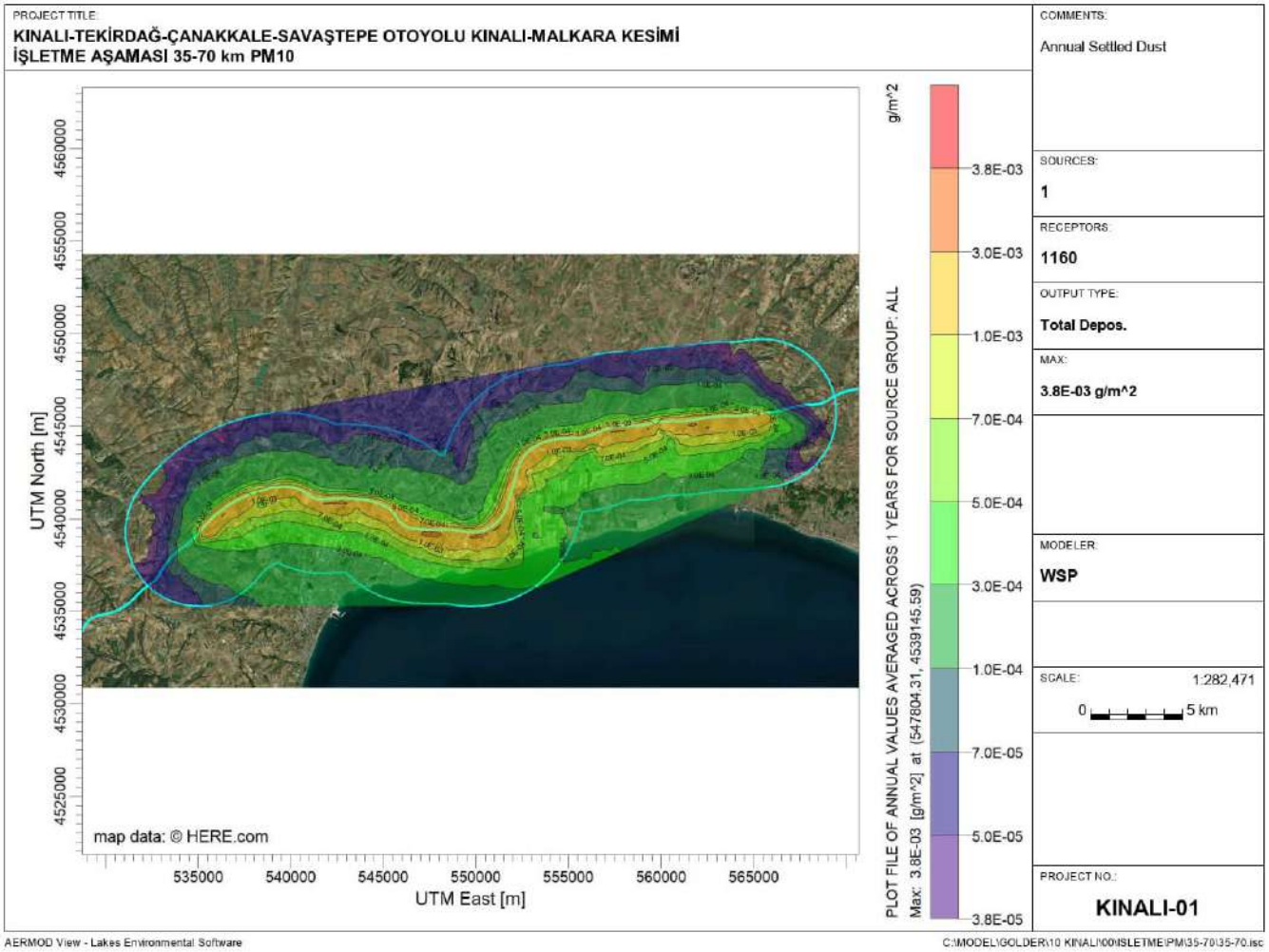



**Figure 56: Scenario-8.a - Dispersion Map of Settled Dust - Yearly**

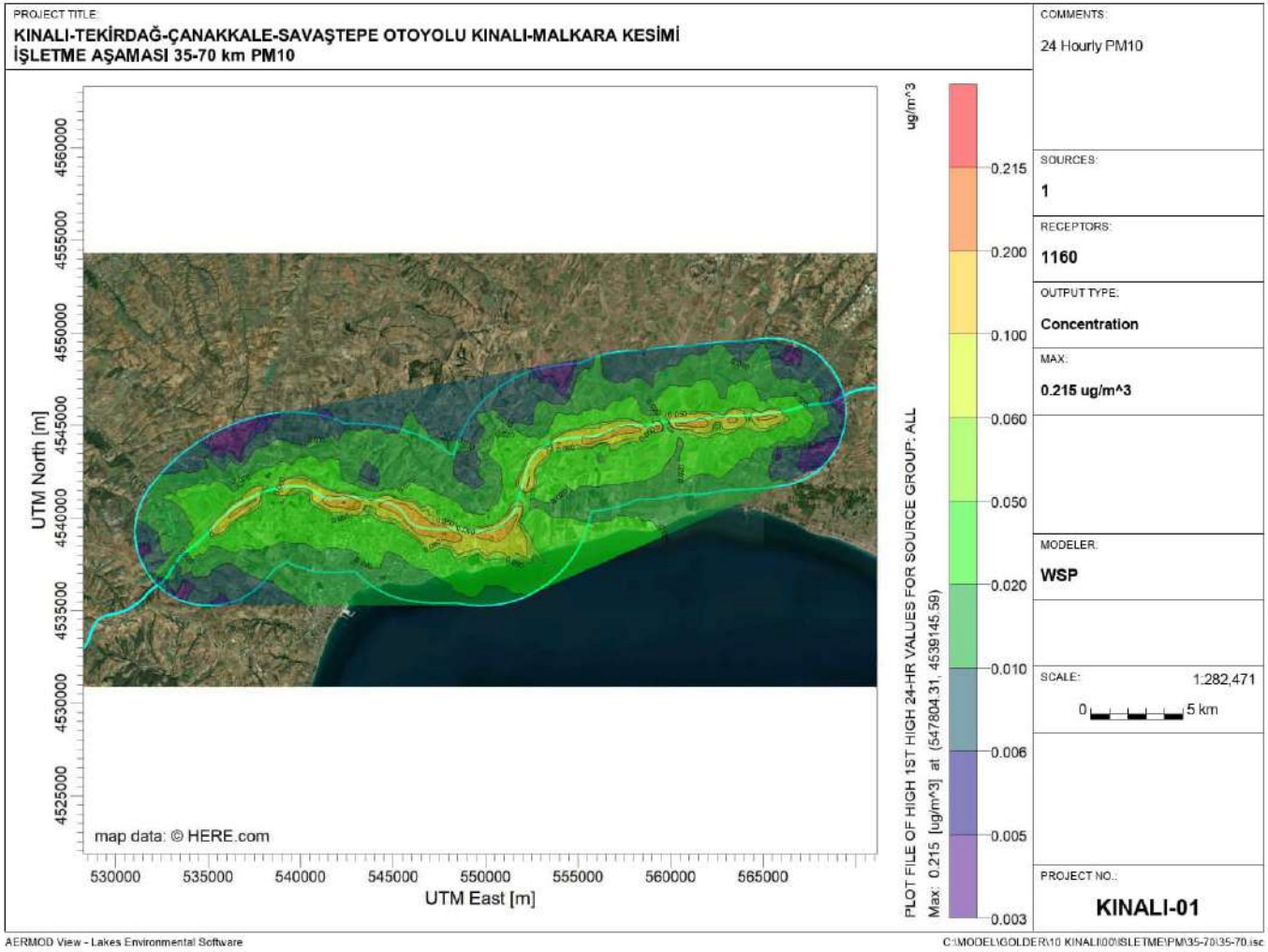



**Figure 57: Scenario-8.a - Dispersion Map of PM10 - 24 hourly**

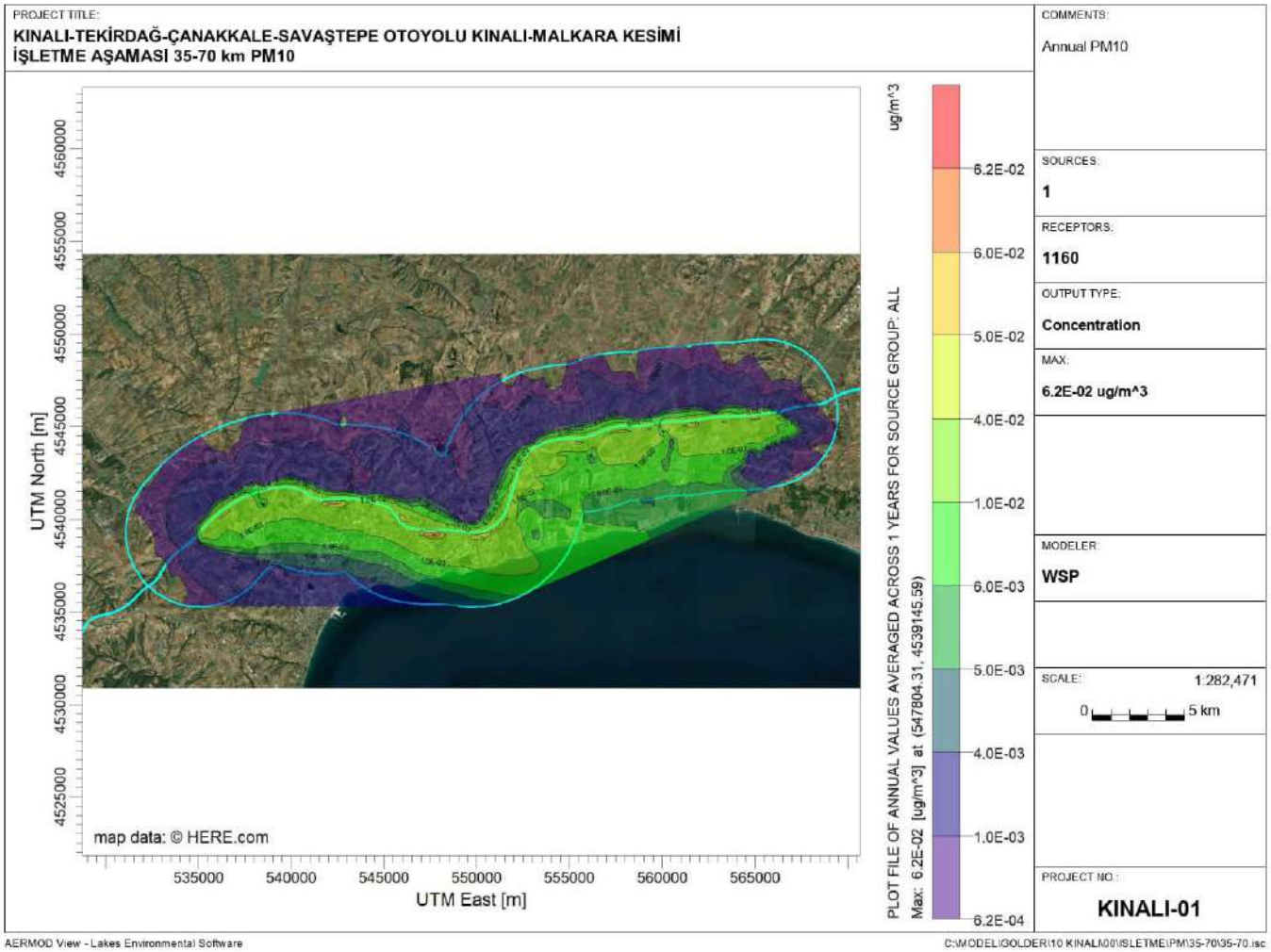



**Figure 58: Scenario-8.a - Dispersion Map of PM10 - Yearly**

# Scenario-9.a – Study Area-4 – Settled Dust and PM10

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 70-105 km PM10

**PM10 - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.18595 | ug/m^3 | 511481.89 | 4528565.01 | 147.17 | 0.00 | 258.00 | 6.01.2021, 24 |
| 24-HR | 35TH | 0.08859 | ug/m^3 | 527884.44 | 4532444.03 | 218.42 | 0.00 | 234.00 | 21.11.2021, 24 |
| ANNUAL | | 0.03978 | ug/m^3 | 527884.44 | 4532444.03 | 218.42 | 0.00 | 234.00 | |

**PM10 - Deposition - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 24-HR | 1ST | 0.00002 | g/m^2 | 505748.89 | 4523951.68 | 168.28 | 0.00 | 173.00 | |
| 24-HR | 35TH | 0.00001 | g/m^2 | 527337.74 | 4531731.98 | 197.90 | 0.00 | 259.00 | |
| ANNUAL | | 0.00293 | g/m^2 | 527884.44 | 4532444.03 | 218.42 | 0.00 | 234.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\PM\70-105\70-105.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 59: Scenario-9.a Modelling Results for Settled Dust and PM10**

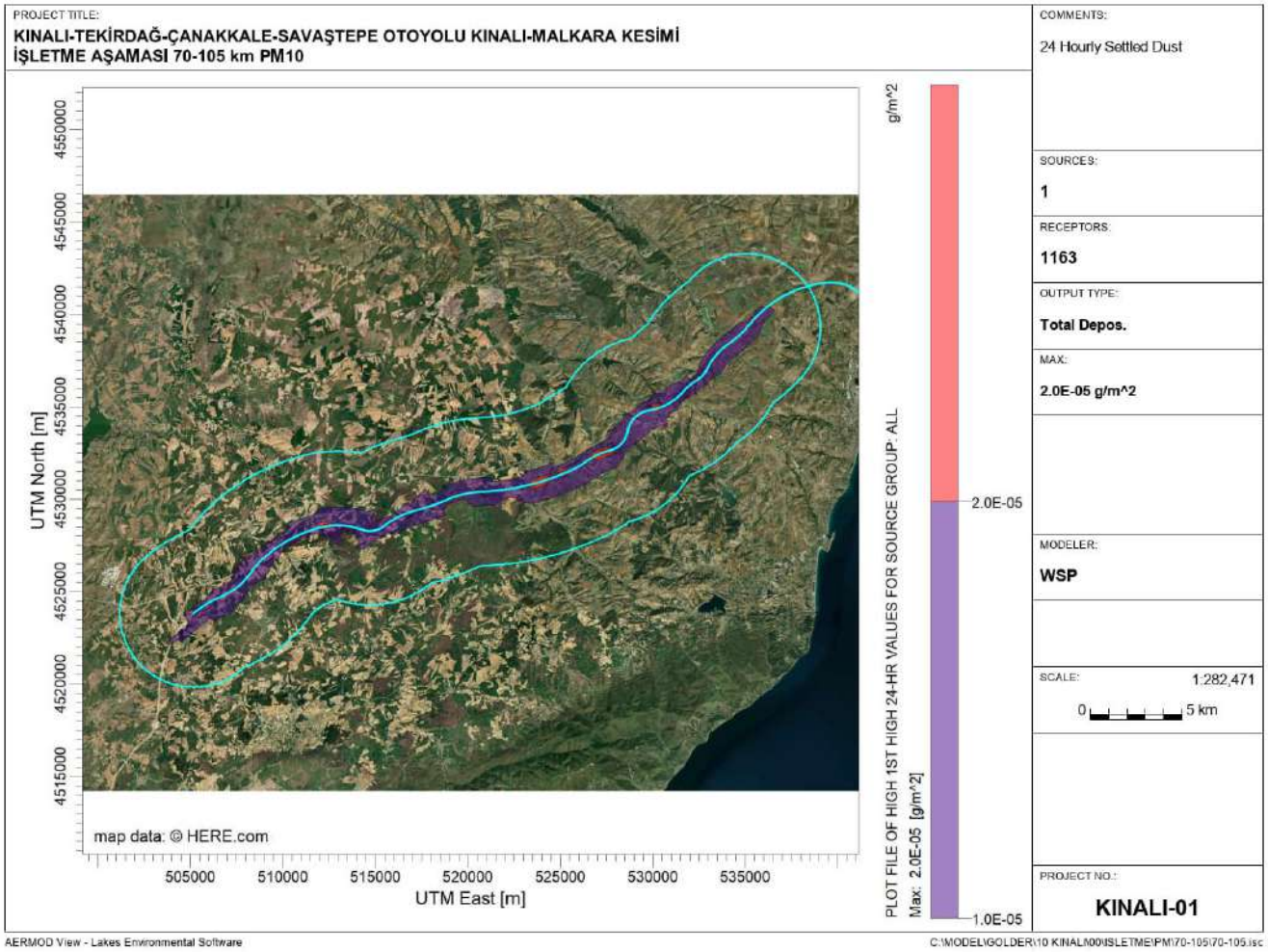



**Figure 60: Scenario-9.a - Dispersion Map of Settled Dust - 24 hourly**

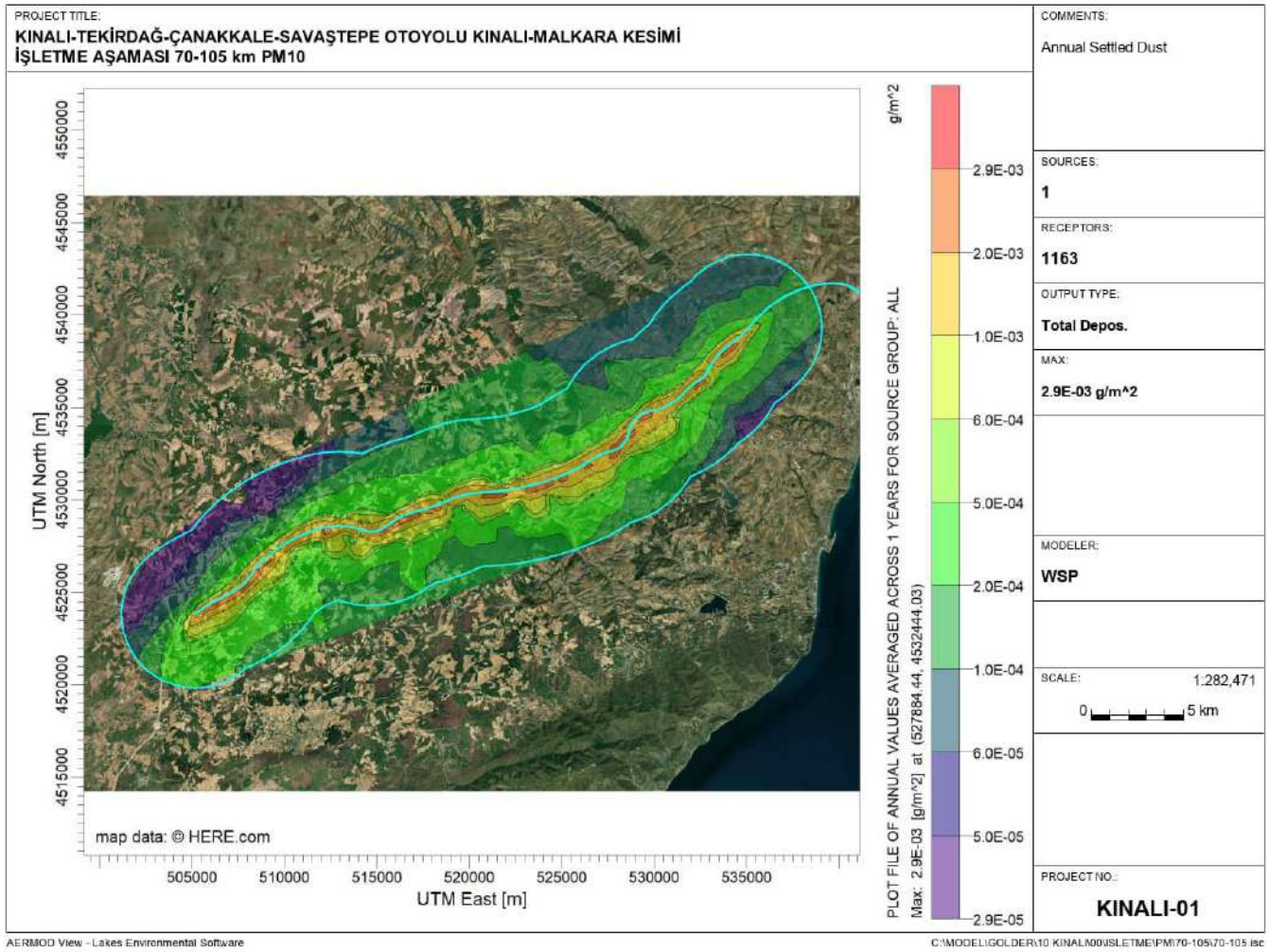



**Figure 61: Scenario-9.a - Dispersion Map of Settled Dust - Yearly**

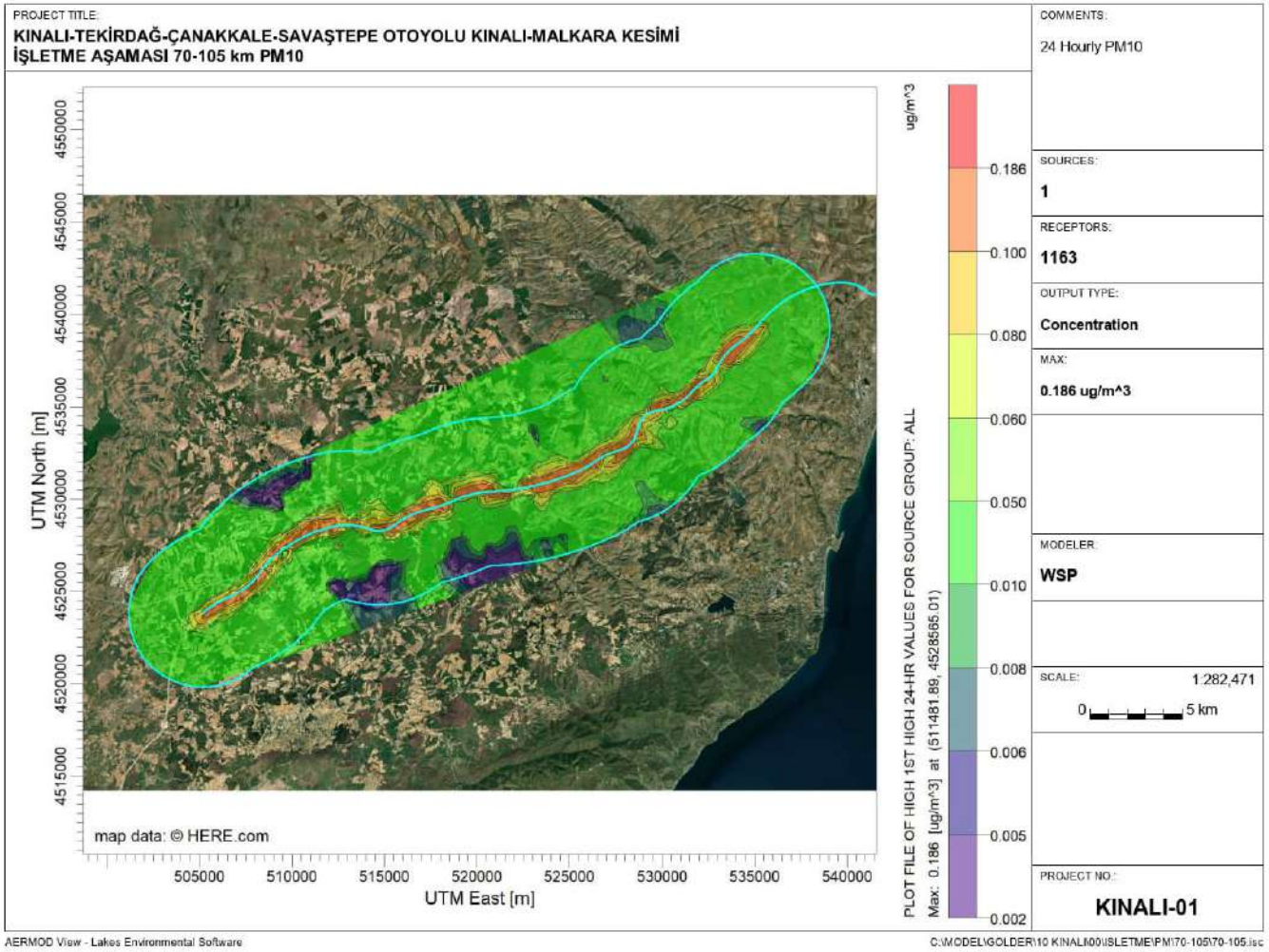



**Figure 62: Scenario-9.a - Dispersion Map of PM10 - 24 hourly**

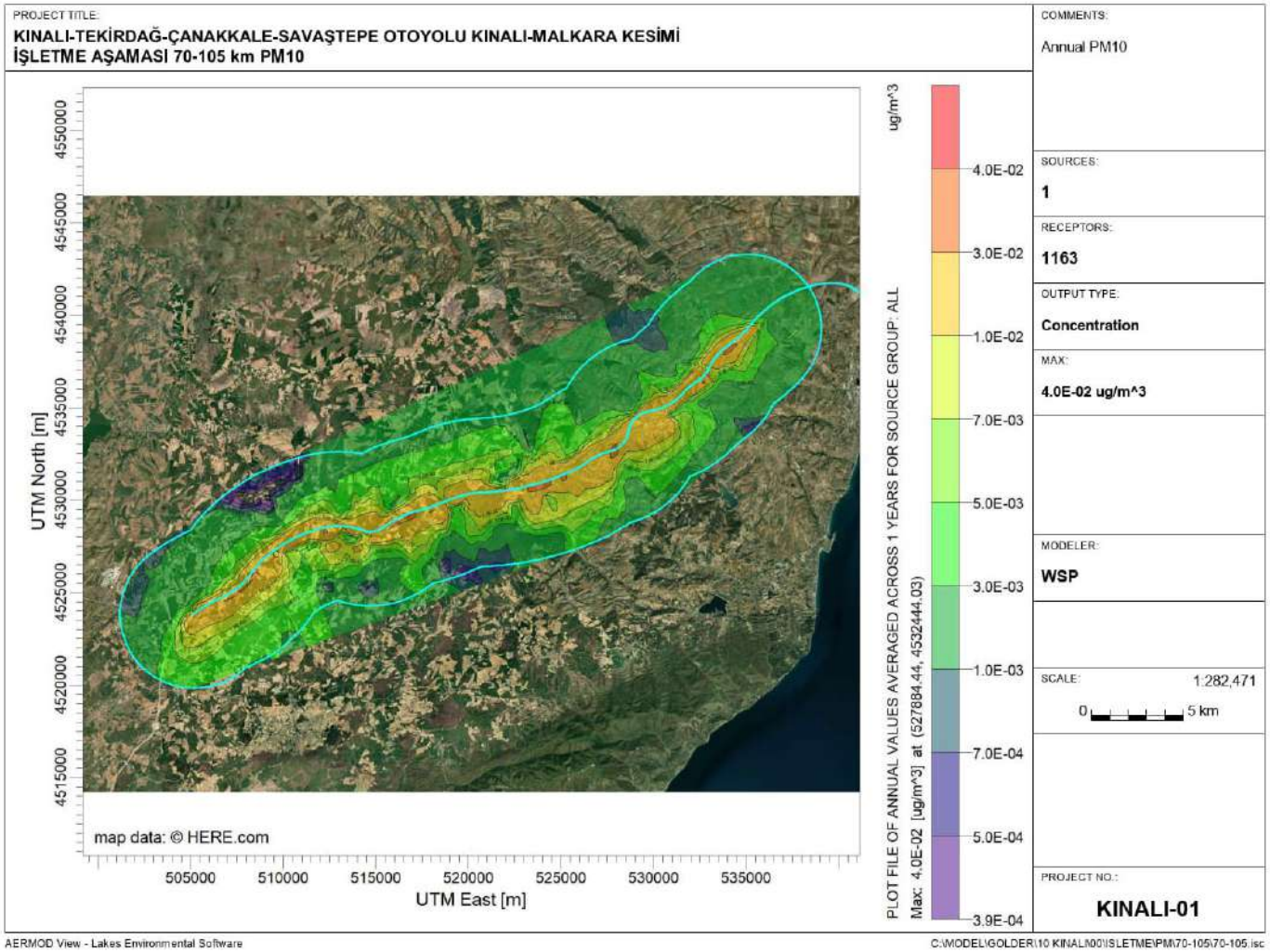



**Figure 63: Scenario-9.a - Dispersion Map of PM10 - Yearly**

# Scenario-7.b – Study Area-1 – CO

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 0-35 km CO

**CO - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 8-HR | 1ST | 14.33409 | ug/m^3 | 576265.77 | 4547304.28 | 76.67 | 0.00 | 76.67 | 25.09.2015, 8 |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\CO\0-35\0-35.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 64: Scenario-7.b Modelling Results for CO**

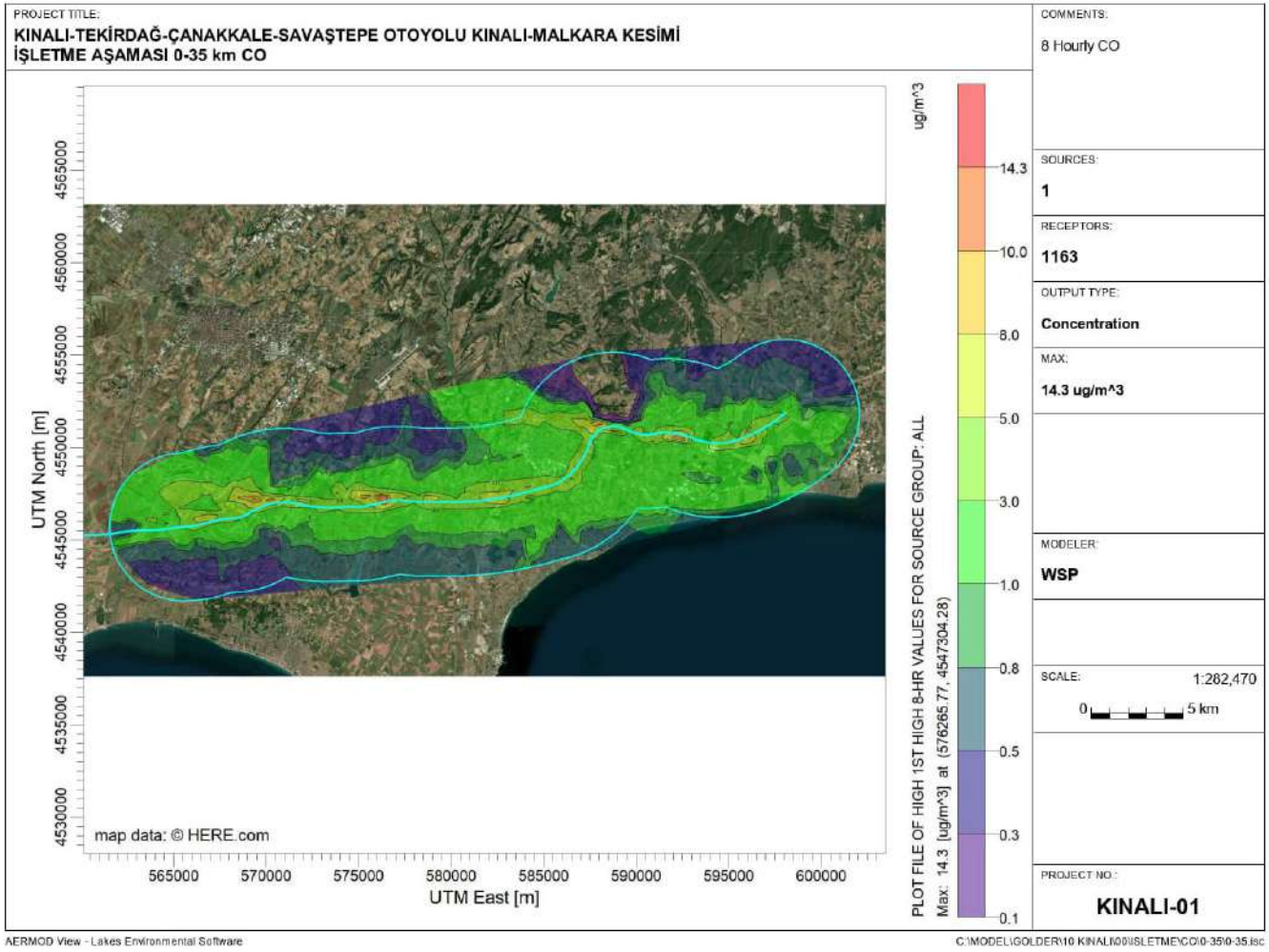



**Figure 65: Scenario-7.b - Dispersion Map of CO - 8 hourly**

# Scenario-8.b – Study Area-3 – CO

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 35-70 km CO

**CO - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 8-HR | 1ST | 0.66794 | ug/m^3 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | 28.11.2020, 24 |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\CO\35-70\35-70.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 66: Scenario-8.b Modelling Results for CO**

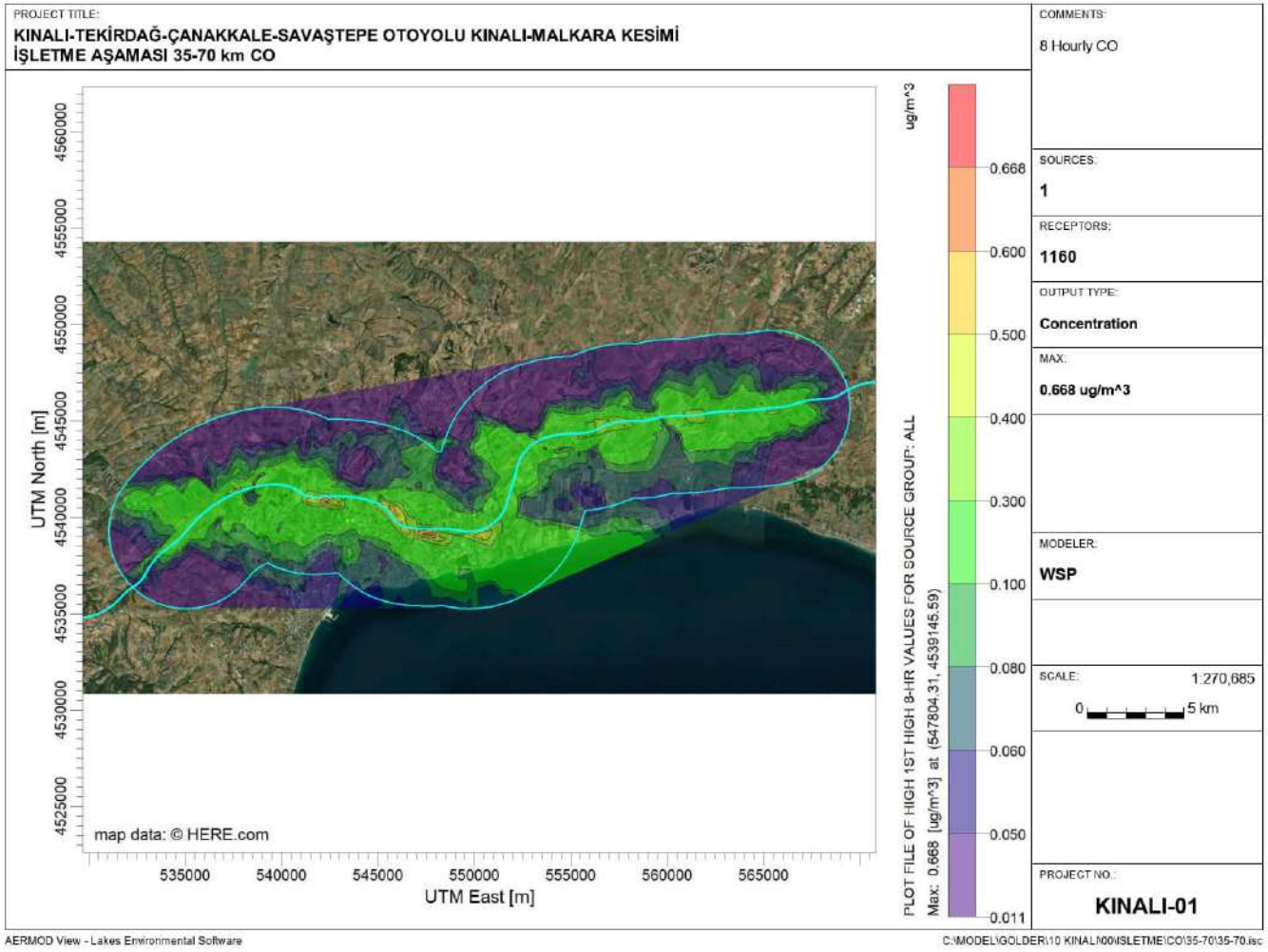



**Figure 67: Scenario-8.b - Dispersion Map of CO - 8 hourly**

# Scenario-9.b – Study Area-4 – CO

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 70-105 km CO

**CO - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 8-HR | 1ST | 11.92752 | ug/m^3 | 511481.89 | 4528565.01 | 147.17 | 0.00 | 258.00 | 6.01.2021, 8 |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\CO\70-105\70-105.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 68: Scenario-9.b Modelling Results for CO**

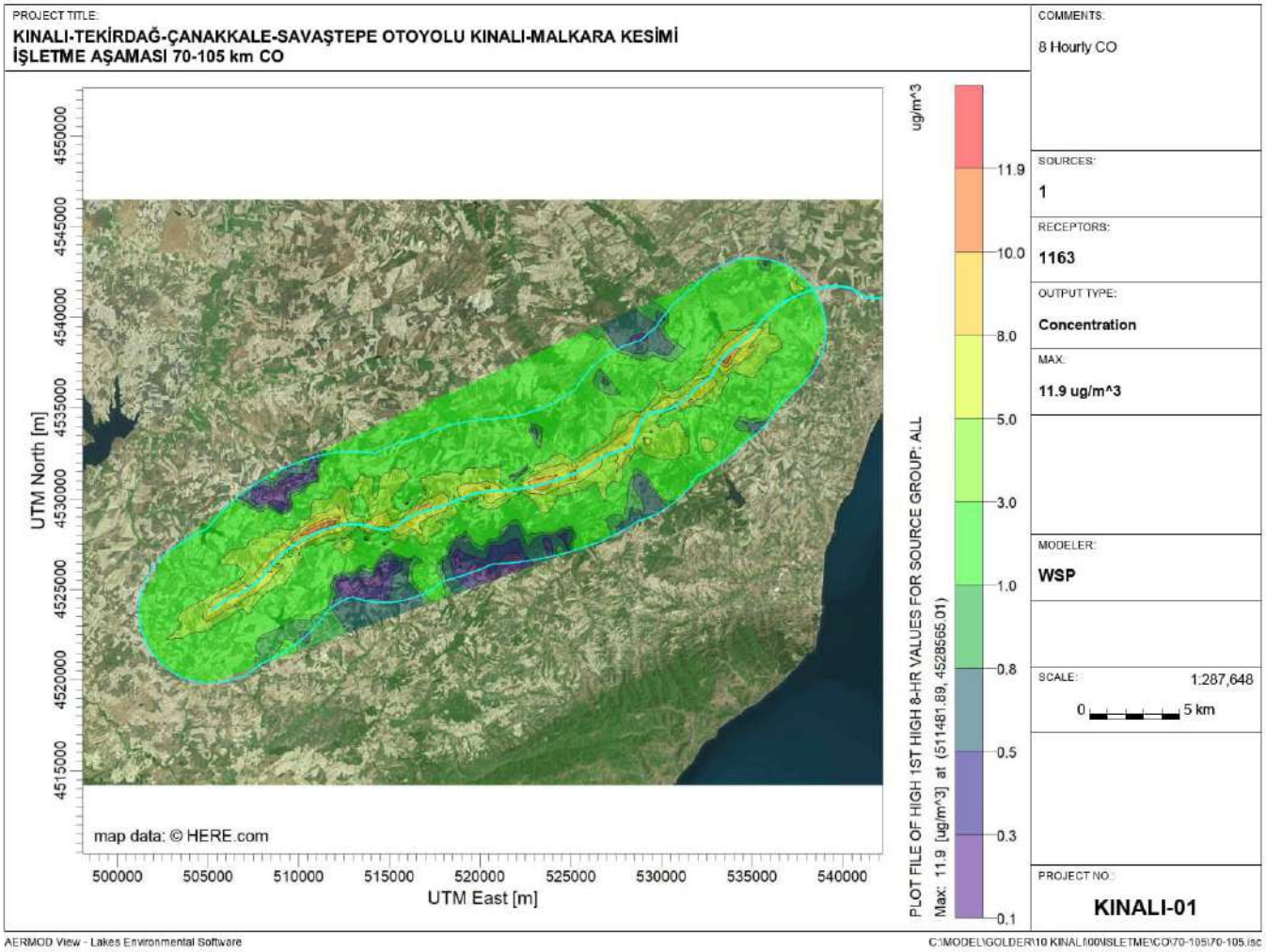



**Figure 69: Scenario-9.b - Dispersion Map of CO - 8 hourly**

# Scenario-7.c – Study Area-1 – VOC

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 0-35 km VOC

**VOC - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 1-HR | 1ST | 48.70023 | ug/m^3 | 576296.83 | 4546793.26 | 59.88 | 0.00 | 59.88 | 14.12.2015, 1 |
| 24-HR | 1ST | 8.43324 | ug/m^3 | 576265.77 | 4547304.28 | 76.67 | 0.00 | 76.67 | 25.09.2015, 24 |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\VOC\0-35\0-35.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 70: Scenario-7.c Modelling Results for VOC**

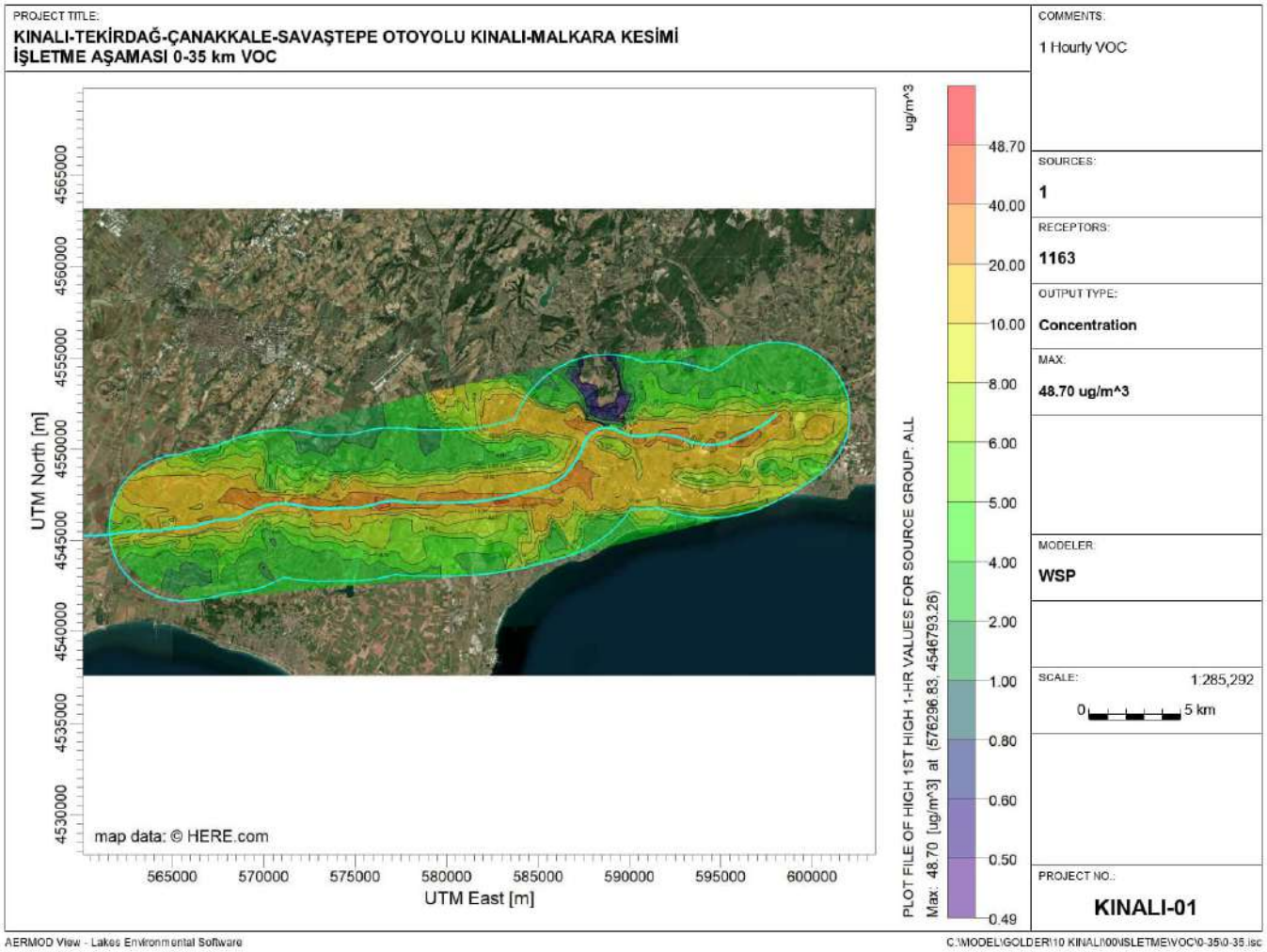



**Figure 71: Scenario-7.c - Dispersion Map of VOC - 1 hourly**

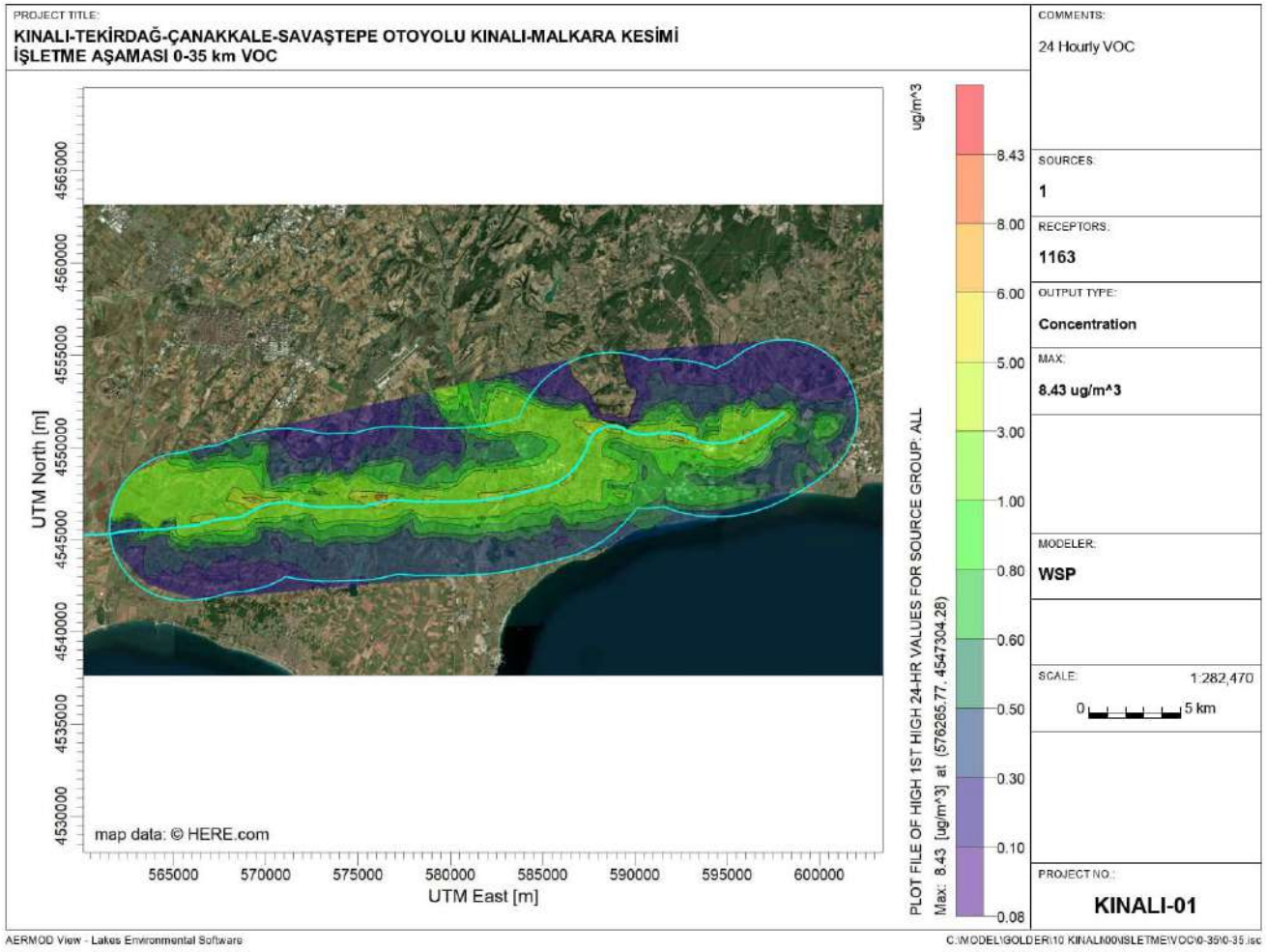



**Figure 72: Scenario-7.c - Dispersion Map of VOC - 24 hourly**

# Scenario-8.c – Study Area-3 – VOC

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 35-70 km VOC

**VOC - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 1-HR | 1ST | 51.55733 | ug/m^3 | 561385.52 | 4545554.85 | 12.00 | 0.00 | 12.00 | 5.12.2020, 7 |
| 24-HR | 1ST | 7.10664 | ug/m^3 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | 28.11.2020, 24 |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\VOC\35-70\35-70.isc
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**Figure 73: Scenario-8.c Modelling Results for VOC**

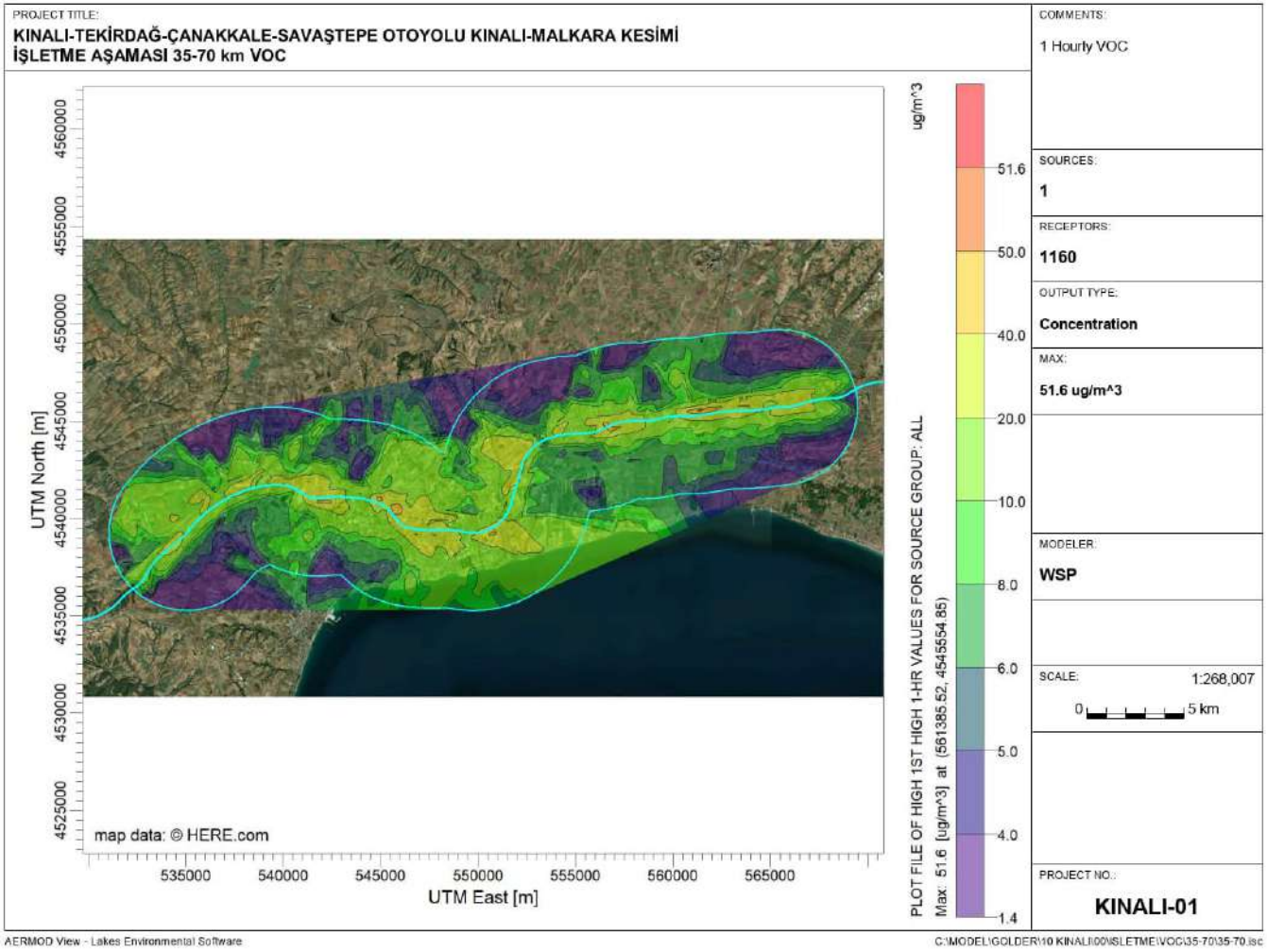



**Figure 74: Scenario-8.c - Dispersion Map of VOC - 1 hourly**

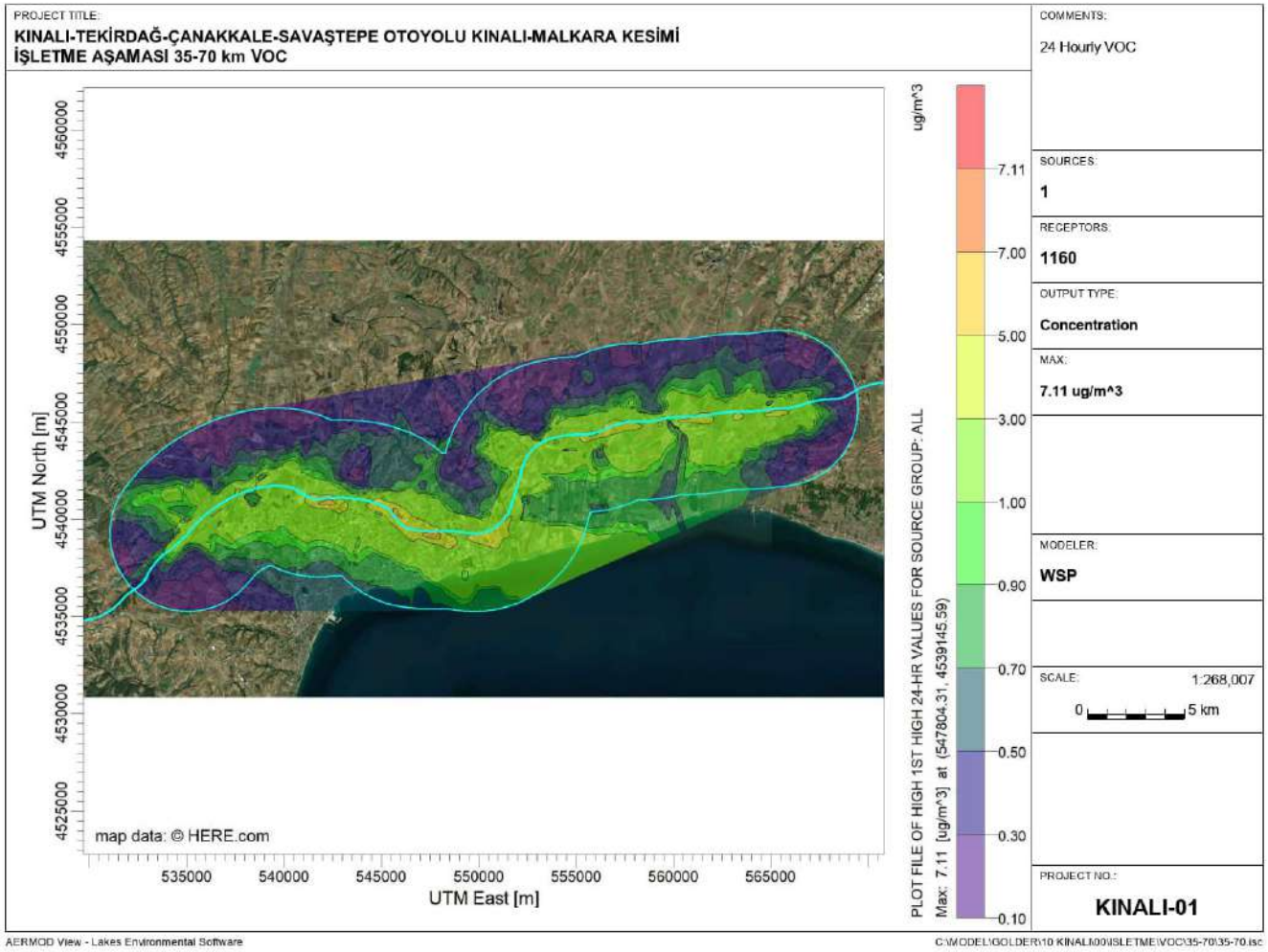



**Figure 75: Scenario-8.c - Dispersion Map of VOC - 24 hourly**

# Scenario-9.c – Study Area-4 – VOC

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 70-105 km VOC

**VOC - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 1-HR | 1ST | 56.45895 | ug/m^3 | 525205.54 | 4531128.80 | 156.92 | 0.00 | 184.00 | 21.10.2021, 4 |
| 24-HR | 1ST | 6.16638 | ug/m^3 | 511481.89 | 4528565.01 | 147.17 | 0.00 | 258.00 | 6.01.2021, 24 |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\VOC\70-105\70-105.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 76: Scenario-9.c Modelling Results for VOC**

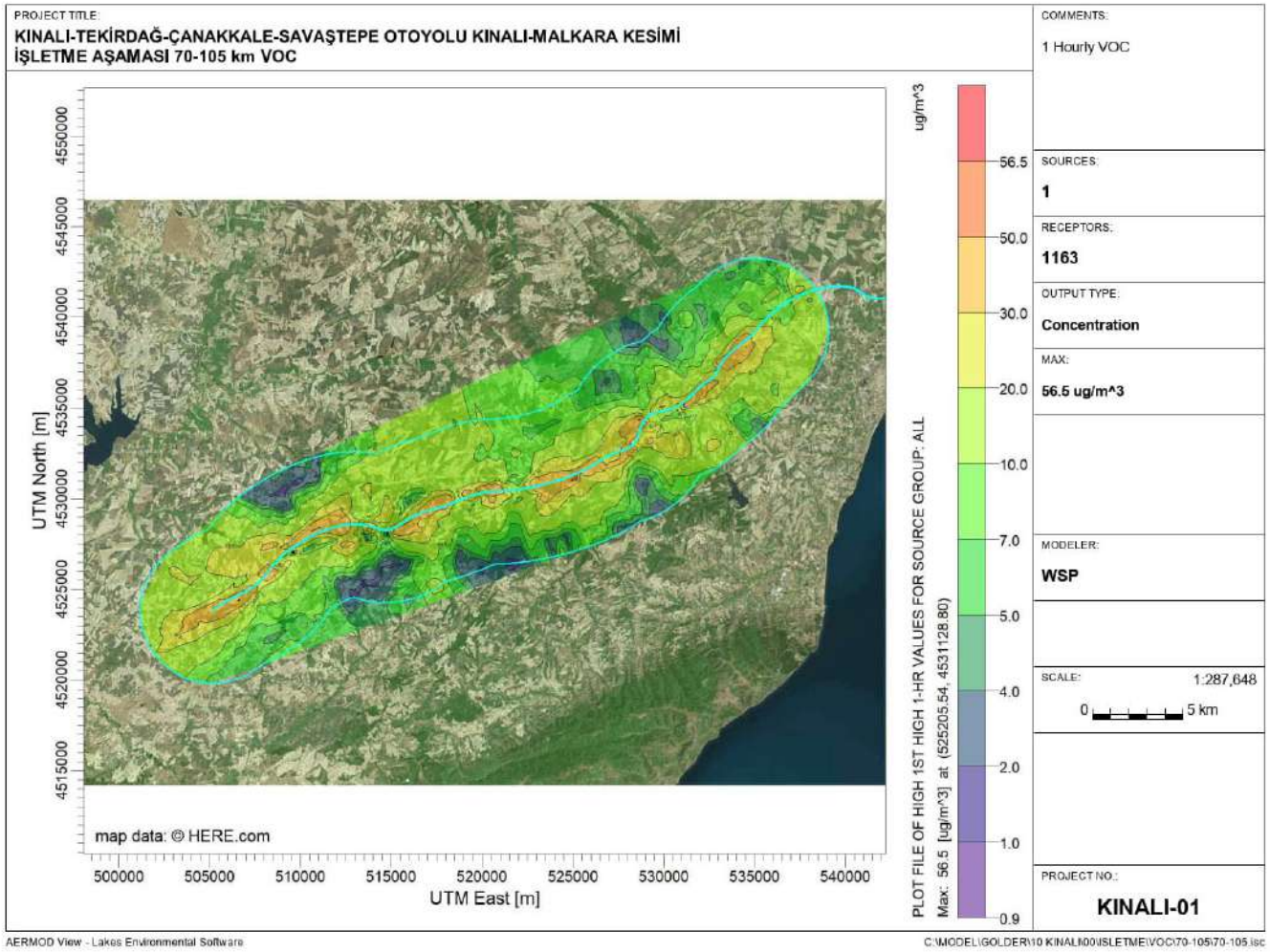



**Figure 77: Scenario-9.c - Dispersion Map of VOC - 1 hourly**

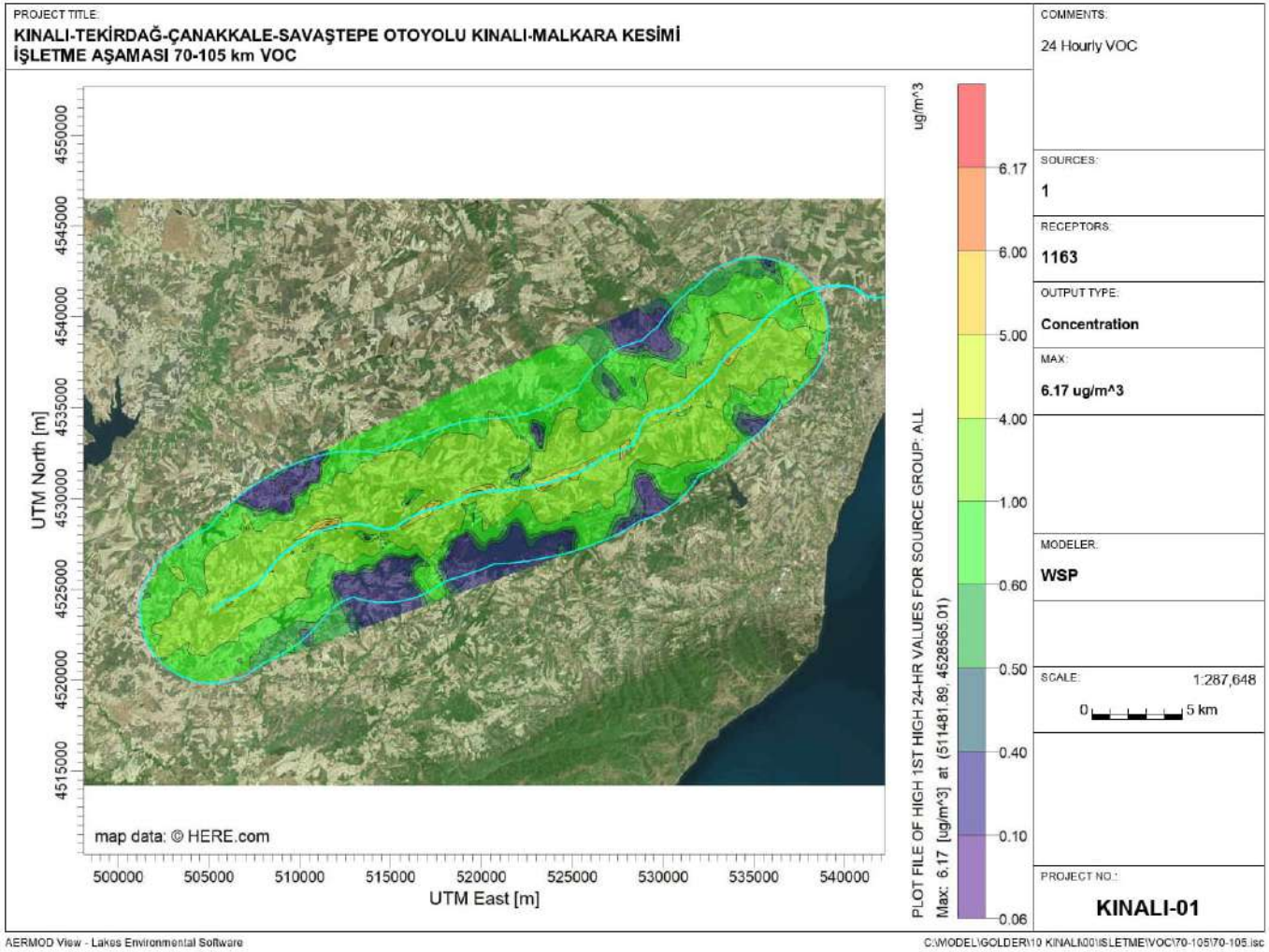



**Figure 78: Scenario-9.c - Dispersion Map of VOC - 24 hourly**

# Scenario-7.d – Study Area-1 – NOx

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 0-35 km NOx

**NOX - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 1-HR | 1ST | 125.31979 | ug/m^3 | 576296.83 | 4546793.26 | 59.88 | 0.00 | 59.88 | 14.12.2015, 1 |
| 1-HR | 18TH | 102.24458 | ug/m^3 | 576265.77 | 4547304.28 | 76.67 | 0.00 | 76.67 | 6.09.2015, 1 |
| ANNUAL | | 1.57558 | ug/m^3 | 592073.81 | 4550528.25 | 22.84 | 0.00 | 22.84 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\NOX\0-35\0-35.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 79: Scenario-7.d Modelling Results for NOx**

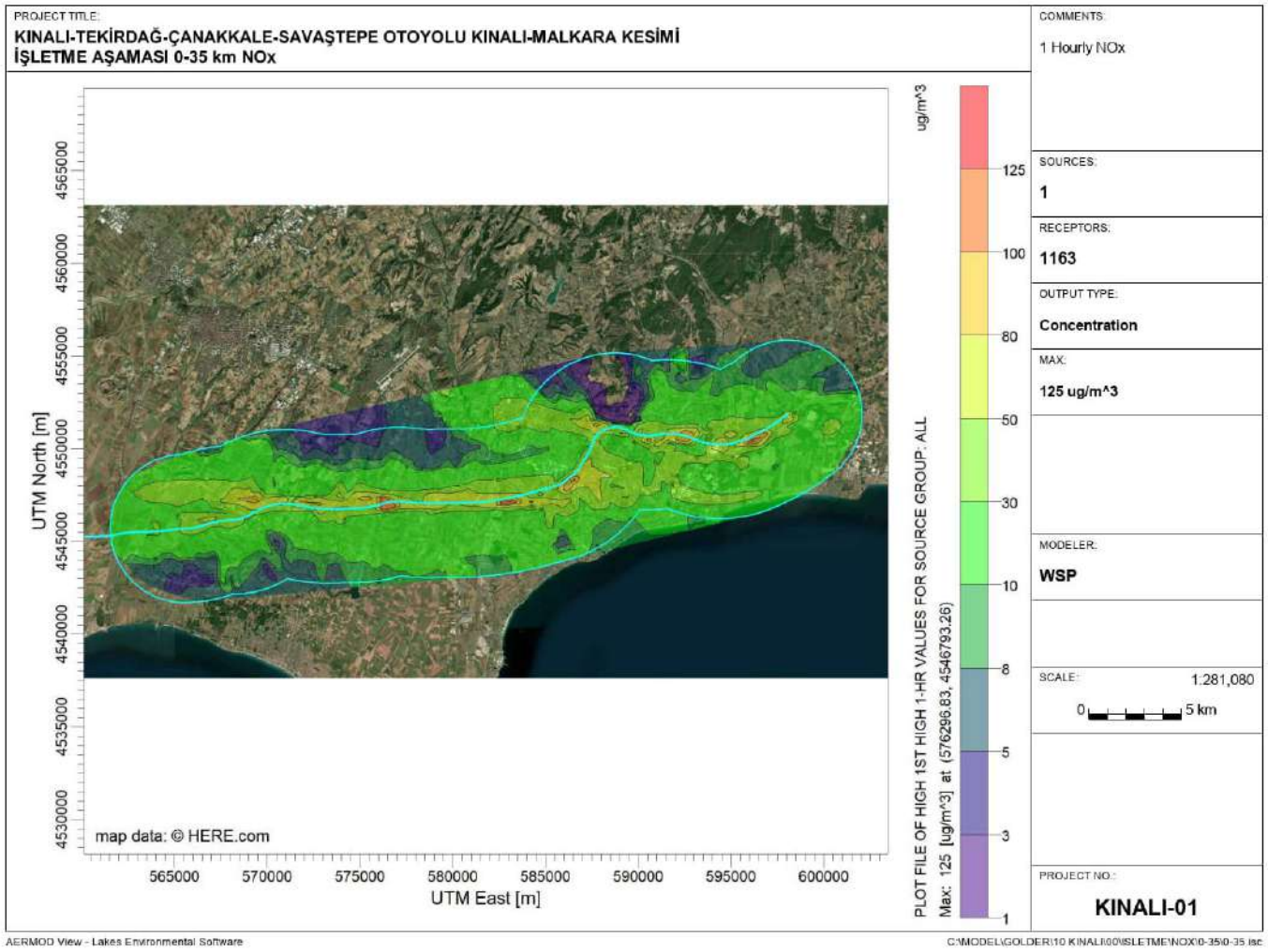



**Figure 80: Scenario-7.d - Dispersion Map of NOx - 1 hourly**

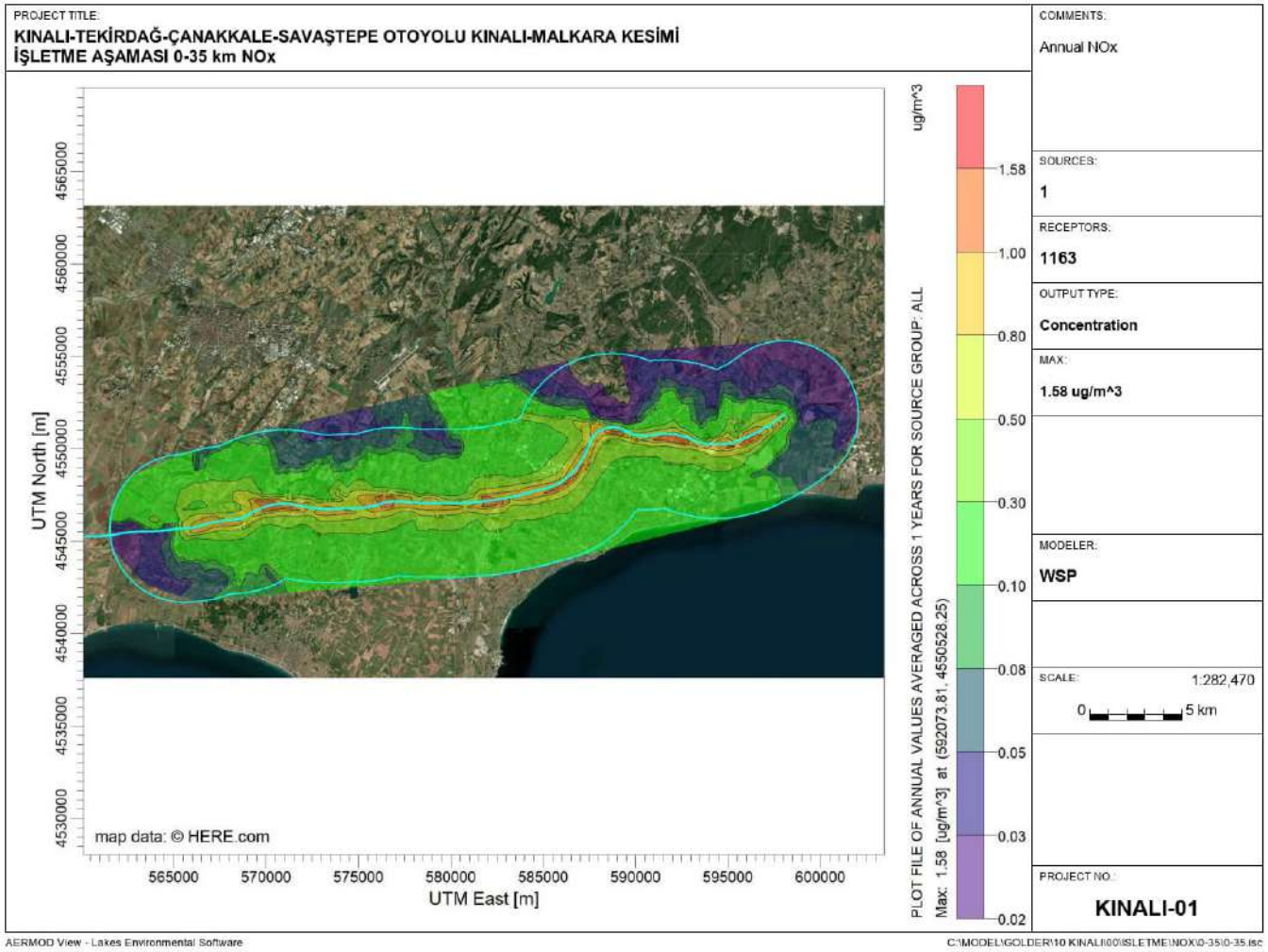



**Figure 81: Scenario-7.d - Dispersion Map of NOx - Yearly**

# Scenario-8.d – Study Area-3 – NOx

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 35-70 km NOx

**NOX - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 1-HR | 1ST | 132.67193 | ug/m^3 | 561385.52 | 4545554.85 | 12.00 | 0.00 | 12.00 | 5.12.2020, 7 |
| 1-HR | 18TH | 74.16209 | ug/m^3 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | 7.10.2020, 21 |
| ANNUAL | | 4.55143 | ug/m^3 | 547804.31 | 4539145.59 | 21.00 | 0.00 | 21.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\NOX\35-70\35-70.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 82: Scenario-8.d Modelling Results for NOx**

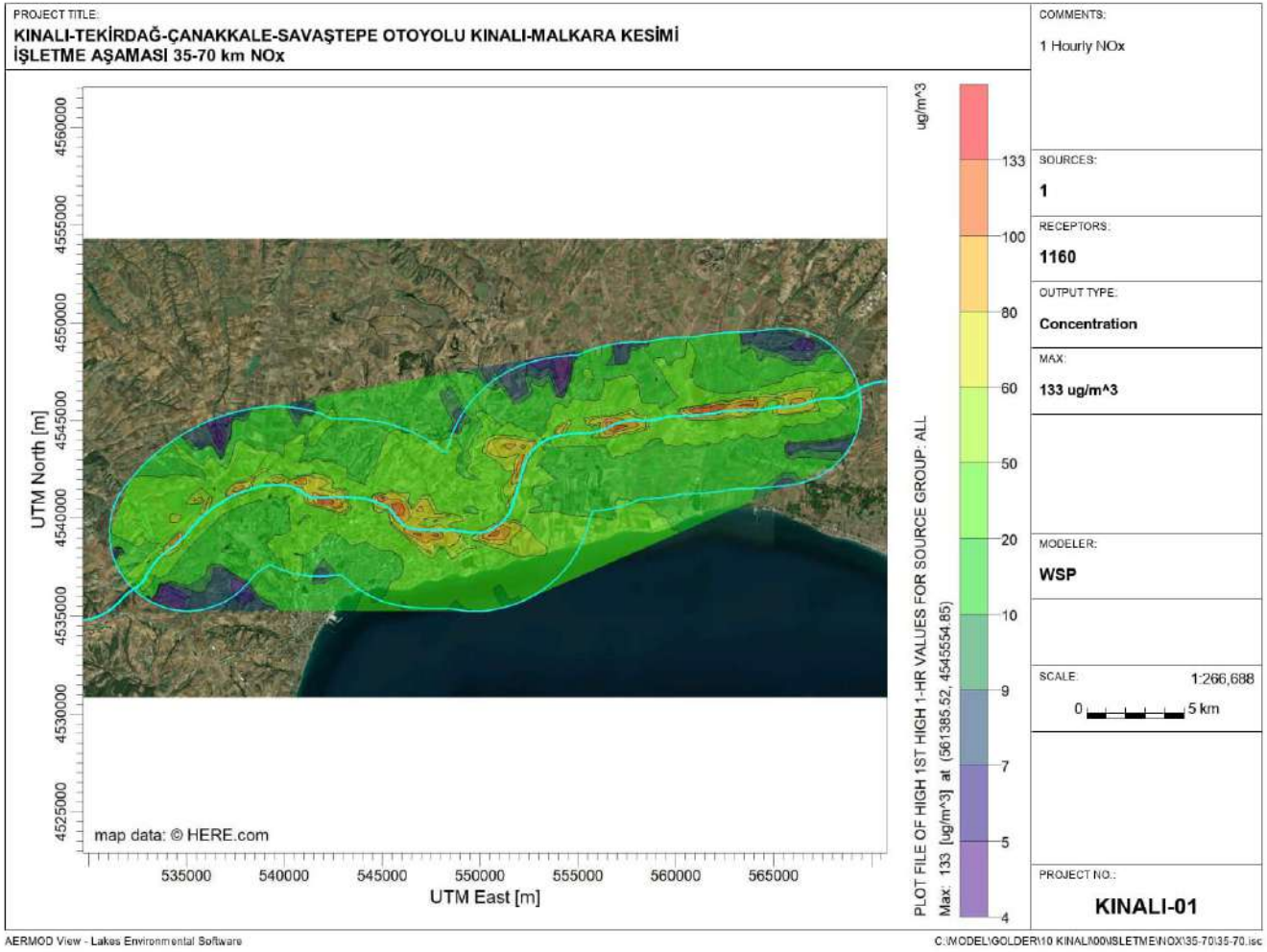



**Figure 83: Scenario-8.d - Dispersion Map of NOx - 1 hourly**

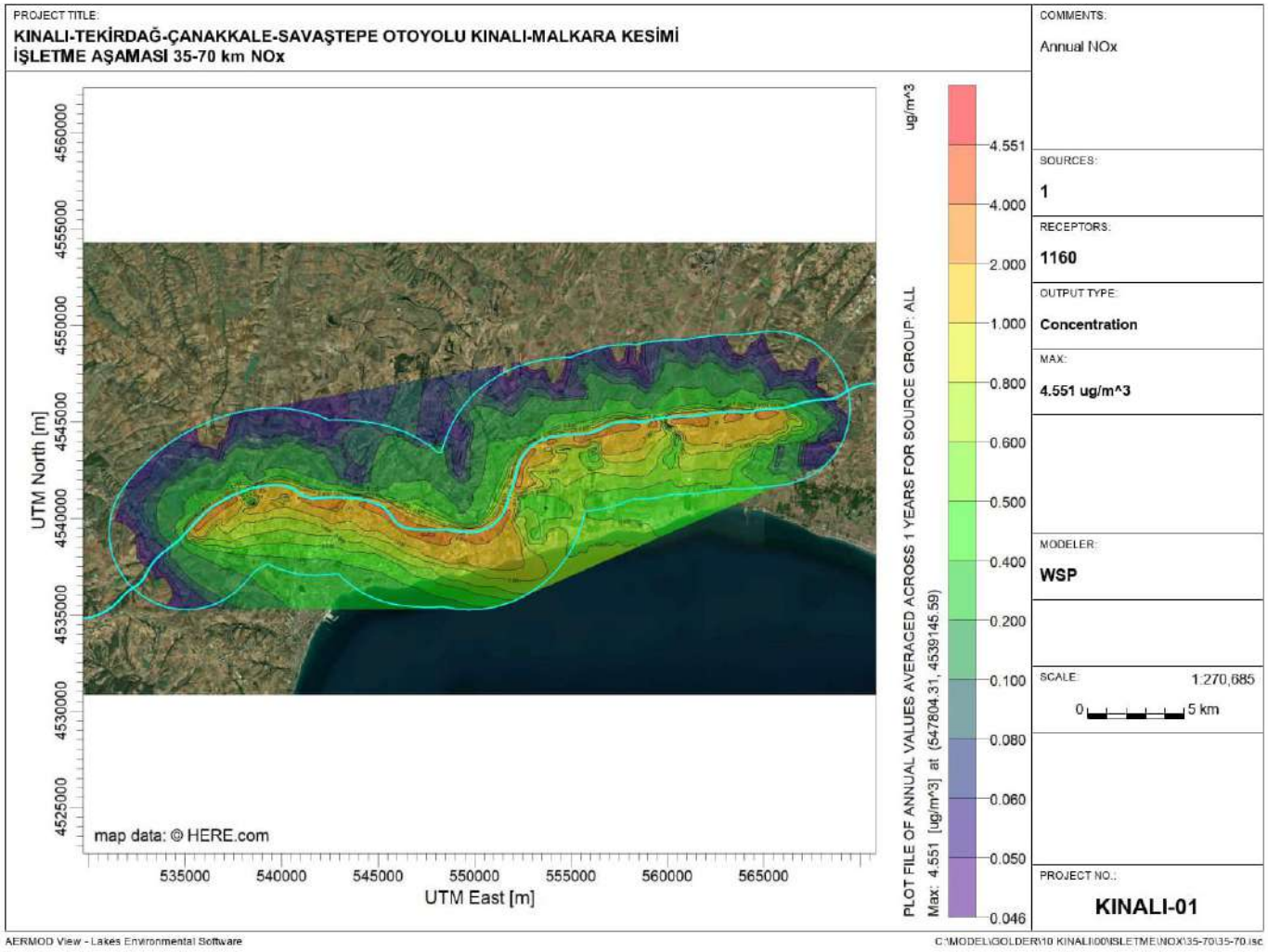



**Figure 84: Scenario-8.d - Dispersion Map of NOx - Yearly**

# Scenario-9.d – Study Area-4 – NOx

## Results Summary

KINALI-TEKİRDAĞ-ÇANAKKALE-SAVAŞTEPE OTOYOLU KINALI-MALKARA KESİMİ
İŞLETME AŞAMASI 70-105 km NOx

**NOX - Concentration - Source Group: ALL**

| Averaging Period | Rank | Peak | Units | X (m) | Y (m) | ZELEV (m) | ZFLAG (m) | ZHILL (m) | Peak Date, Start Hour |
|---|---|---|---|---|---|---|---|---|---|
| 1-HR | 1ST | 145.28522 | ug/m^3 | 525205.54 | 4531128.80 | 156.92 | 0.00 | 184.00 | 21.10.2021, 4 |
| 1-HR | 18TH | 78.87614 | ug/m^3 | 511481.89 | 4528565.01 | 147.17 | 0.00 | 258.00 | 9.08.2021, 22 |
| ANNUAL | | 2.82996 | ug/m^3 | 527884.44 | 4532444.03 | 218.42 | 0.00 | 234.00 | |

Project File: C:\MODEL\GOLDER\10 KINALI\00\ISLETME\NOX\70-105\70-105.isc
AERMOD View by Lakes Environmental Software RS - 1 of 1 23.07.2024

**Figure 85: Scenario-9.d Modelling Results for NOx**

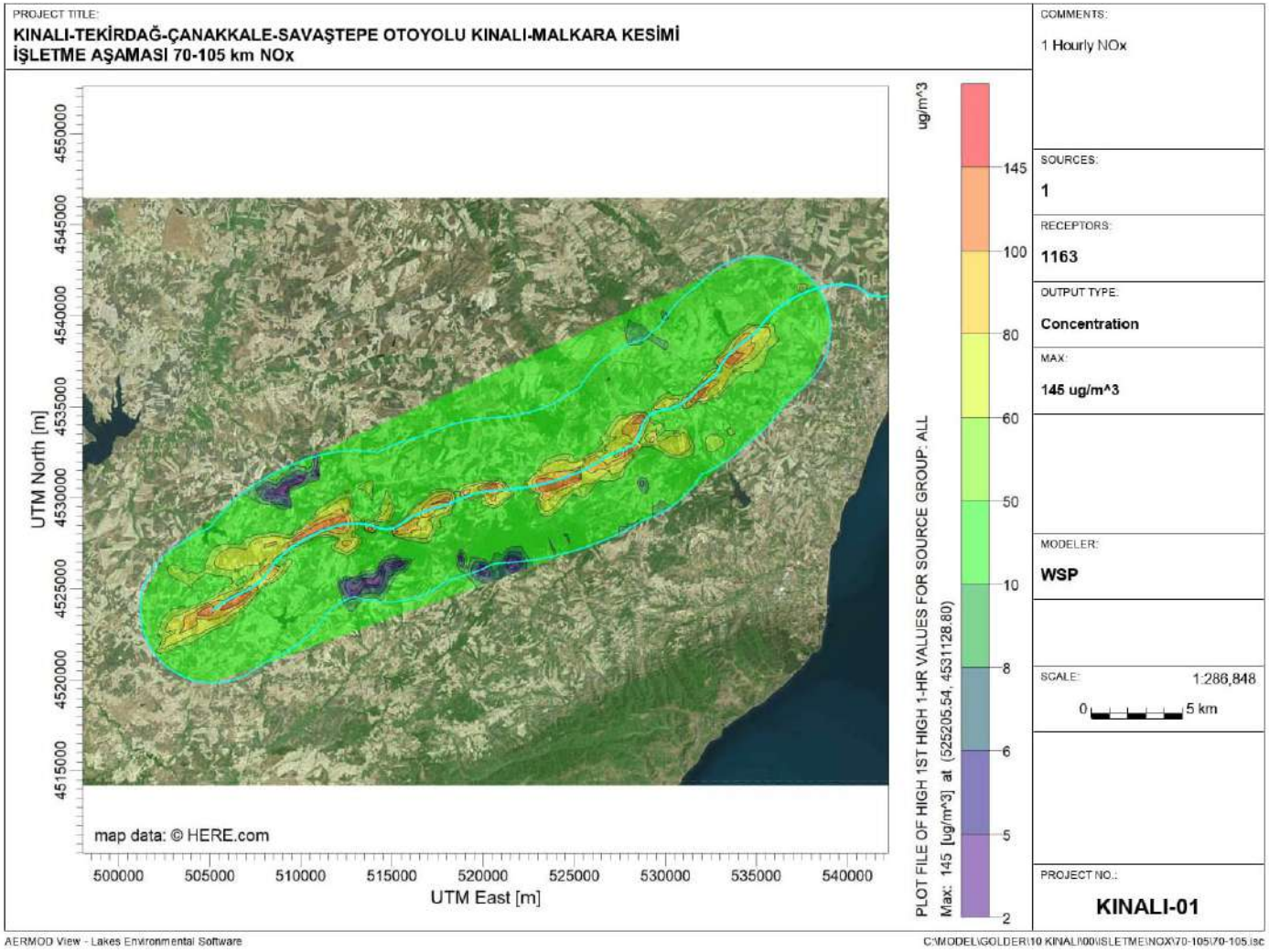



**Figure 86: Scenario-9.d - Dispersion Map of NOx - 1 hourly**

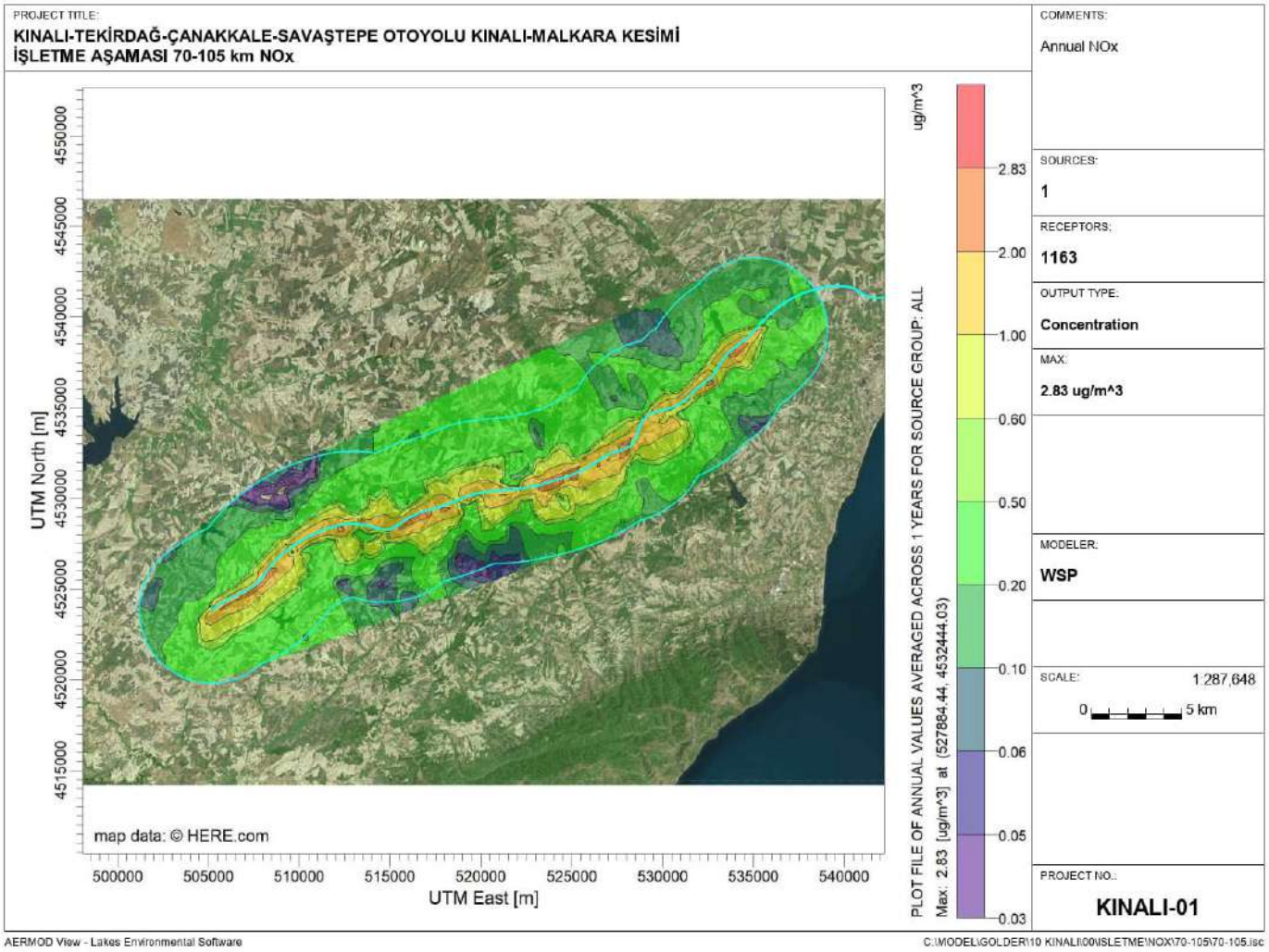



**Figure 87: Scenario-9.d - Dispersion Map of NOx - Year**



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**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix H - Climate Change Risk Assessment*

Submitted to:

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22519766-final draft

March, 2025



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# 1.0 CLIMATE CHANGE RISK ASSESSMENT

## 1.1 INTRODUCTION

Climate change is a multifaceted and complex issue that can lead to serious environmental and socioeconomic consequences and even threaten the security of countries. The impacts of climate change have become one of the most important challenges for the life of future generations.

- Within this framework stands the recent revision and release of the **Equator Principles , version IV**[1] (EP4) which is a risk management framework adopted by financial institutions for determining, assessing, and managing environmental and social risks in projects and is primarily intended to provide a minimum common standard for due diligence and monitoring to support responsible risk decision-making. The EP4 categorize projects that are financed by Equator Principles Financing Institutions (EPFIs) based on the environmental and social impacts that they generate and the risks that they may pose to financing. Category A projects have the highest risks, while category C is used for low-risk projects.

According to EP4, a Climate Change Risk Assessment (CCRA) is required to be undertaken:

- For Category A and, as appropriate, Category B projects. For these projects, the CCRA has to include consideration of relevant climate-related 'Physical Risks' as defined by the **Task Force on Climate-Related Financial Disclosure (TCFD)**[2].
- For all projects, in all locations, when combined Scope 1 and Scope 2 emissions are expected to be more than 100,000 tons of $CO_2$ equivalent annually. For these projects, the CCRA is to include considerations of climate-related 'transition risks' (as defined by the TCFD). The CCRA must also include a completed alternatives analysis which evaluates less greenhouse gas (GHG) intensive alternatives.

The TCFD Recommendations on Climate-related Financial Disclosures state that "*physical risks resulting from climate change can be event-driven (acute) or longer-term shifts (chronic) in climate patterns*". Even though this Project is not subject to the EP4, considering the increasing relevancy of climate change, a Climate Change Risk Assessment is being carried out as Good International Industry Practice (GIIP).

**Acute physical climate risks** can include increased severity and frequency of droughts, storms, floods and wildfires. **Chronic physical climate risks** can include sea level rise and longer-term temperature increase. Climate-related physical risks may include a variety of effects:

- Direct damage to assets, as a result of extreme weather events (i.e., drought, storms) or rising sea levels.
- Changes in water availability, sourcing and quality, often with consequent social impacts.
- Disruption to operations, ability to transport goods and supplies and impacts on employee/community safety, and more.

The Project's GHG inventory has been assessed for both construction and operation phases in consideration with Scope 1 and Scope 2 emissions to be emitted as a result of the Project activities. Based on that, annual GHG emissions for construction and operation phases of the Project are calculated as 96,256.4 t CO2e/year and 18,819.5 t CO2e/year, respectively, within the Section 7.1.7 of the ESIA Report. According to the outcomes of this analysis, a transition risks analysis has not been included in this risk assessment.

[1] The Equator Principles Association, 2020 (The Equator Principles_EP4_July2020 (equator-principles.com).

[2] See Task Force on Climate-Related Disclosures, Recommendations of the Task Force on Climate-related Financial Disclosures, June 2017.

## 1.2 OVERVIEW OF THE CLIMATE CHANGE PHYSICAL RISK ASSESSMENT METODOLOGY

According to the **ISO 14091 Standard "Adaptation to climate change – Guidelines on vulnerability, impacts and risk assessment**[3]", the CCRA fulfils diverse objectives depending on the information needs of a client, and on challenges caused by climate change. These can include the following.

- **Raising awareness**: CCRA helps increasing awareness of the consequences of climate change.
- **Identification and prioritization of risks**: many factors contribute to a system's sensitivity, exposure and adaptive capacity. CCRA provides insight into these factors, and this helps the client to prioritize the risks to be addressed.
- **Identification of entry points for climate change adaptation intervention**: the final results and the process of the CCRA can help identifying possible adaptation responses. CCRA can show where early action is required.
- **Tracking changes in risk and monitoring and evaluating adaptation**: repeating CCRA can help to track changes over time and generate knowledge on the effectiveness of adaptation.

This section of the CCRA chapter presents an overview of the methodology for CCRA for physical risks and applies it to the current Project. The assessment will result in the identification of physical risks that may affect the Project within a certain time frame, and in a number of adaptative measures that the Project may consider and implement to mitigate these risks.

WSP developed a CCRA based on existing methodologies for the assessment of climate change risks and vulnerability as part of adaptation strategies. Guidelines and methodologies from the **ISO 14091** as well as the **Intergovernmental Panel on Climate Change (IPCC)**[4] and the **World Bank Group**[5] were used as a guidance for defining factors that contribute to determine the risks. These methodologies consider a variety of risk components whose definitions are as follows:

- Climate-related Hazard: natural or human induced climate-related hazard, such as flood, wildfire, extreme heat, that can occur at the Project Area. The changes in intensity of hazard related events and of their probability over-time are influenced by climate change.
- Exposure: the possibility for a Project in a specific site to be adversely affected by a certain hazard because of the presence of certain Project services, resources, infrastructures, people and other Project's intrinsic elements that are prone to be affected. A Project, depending on its intrinsic nature and characteristics, may or may not be exposed to a certain hazard that occur at the Project Area. Exposure is therefore an indicator of the fact that the Project "can or cannot be affected" by a certain hazard.
- Sensitivity: propensity or predisposition of elements of the Project to be affected by a certain hazard. Sensitivity is a measure of "how much" a Project exposed to a certain hazard can be affected.
- Adaptive capacity: the ability of the Project to adjust to climate hazard-related events, to mitigate potential damages, to take advantage of opportunities, or to respond to the consequences.

[3] ISO 14091 gives guidelines for assessing the risks related to the potential impacts of climate change. It describes how to understand vulnerability and how to develop and implement a sound risk assessment in the context of climate change.

[4] The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change.

[5] The World Bank Group (WBG) is a family of five international organizations that make leveraged loans to developing countries.

- Vulnerability: expresses the magnitude of potential effects and consequences of climate hazard-related events on elements of the Project. Vulnerability results from the combination of Sensitivity and Adaptive capacity.
- Risk: the result of the combination of Hazard probability or intensity at a certain time and the Vulnerability.

This methodology assesses different climate-related hazards independently, at present and in the future, over a time consistent with the temporal scope of the assessment, and according to different future carbon emission scenarios. For each specific hazard, the risk components are assigned a qualitative class (“i.e., “high”, “medium”, “low”) and then combined using qualitative matrices, as explained in Figure 1.The result is a class of Risk (“low”, “medium”, “high” or “extreme”) for each climate-related hazard considered in the analysis. The following figure shows risk assessment process for a specific hazard “h” the Project is exposed to.

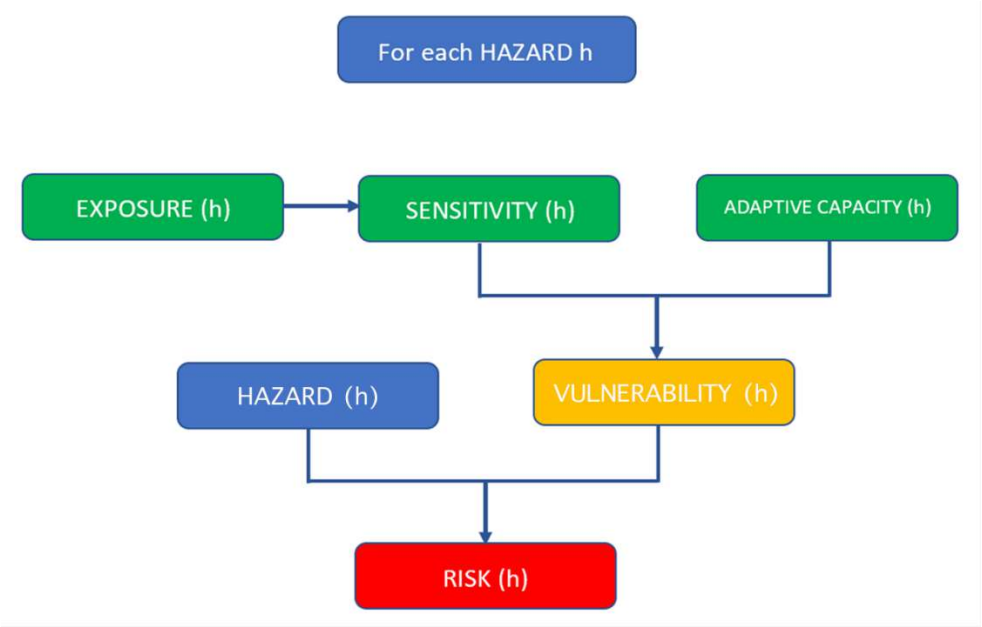



**Figure 1: Workflow of the risk assessment for a specific hazard “h” the Project is exposed to, showing how different risk factors are combined across the analysis.**

## 1.3 PHYSICAL RISKS ASSESSMENT

The CCRA that follows is referred to Kınalı-Malkara Motorway Project located in the north-western part of Türkiye. The 105.3 km Kınalı-Malkara Motorway Project will start from Silivri District of İstanbul Province and will pass through Marmaraereğlisi, Çorlu, Süleymanpaşa and Malkara districts of Tekirdağ Province. Project location and general layout of the Project are presented in Figure 2, respectively. The provinces and districts that Project will pass through between 0+000 km and 105+300 km are given in detail below.

- İstanbul Province, Silivri District (0+000 km - 17+700 km)
- Tekirdağ Province, Marmaraereğlisi District (17+700 km - 25+200 km)
- Tekirdağ Province, Çorlu District (25+200 km - 43+600 km)
- Tekirdağ Province, Süleymanpaşa District (43+600 km - 95+600 km)
- Tekirdağ Province, Malkara District (95+600 km - 105+272 km)

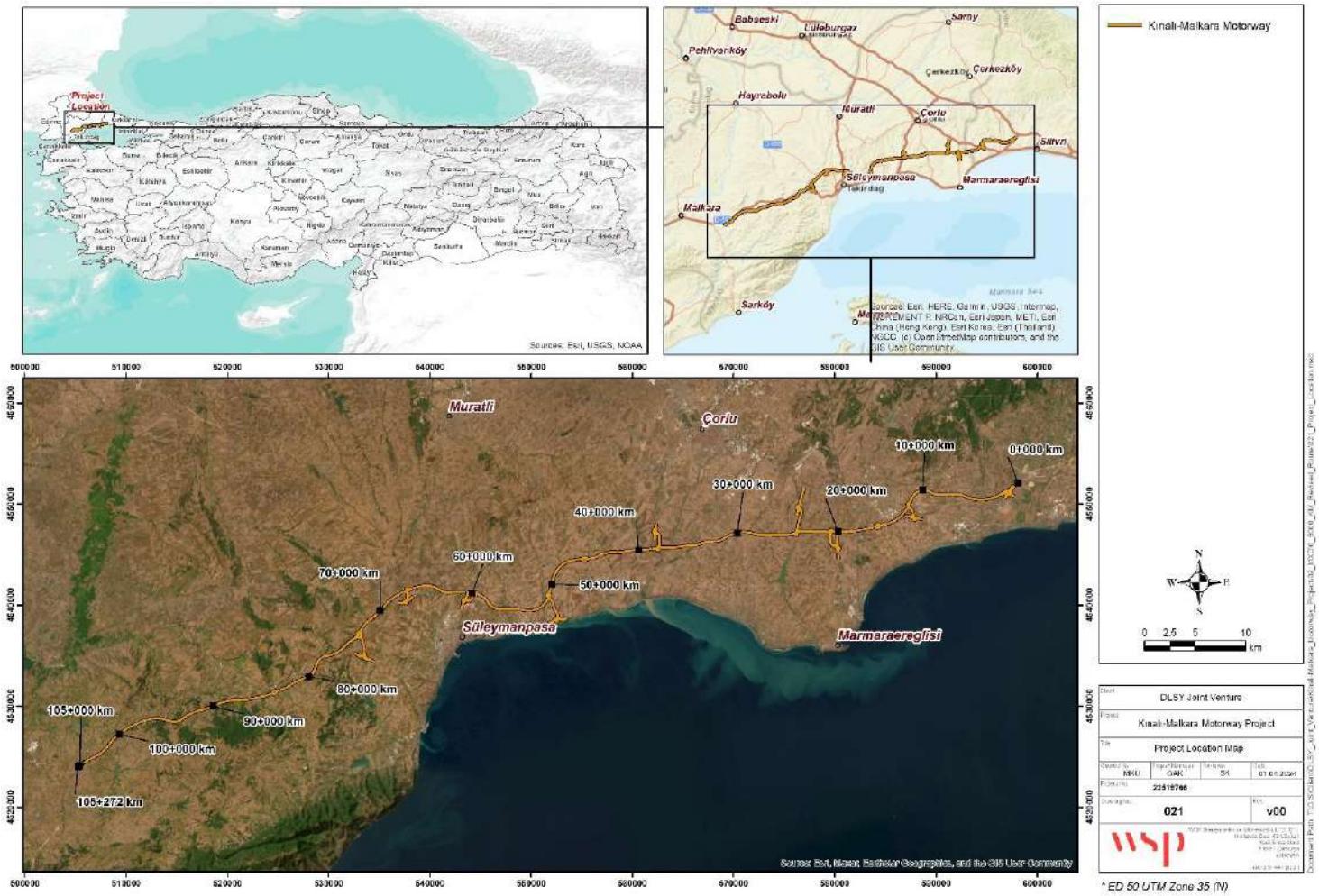



**Figure 2: Kınalı-Malkara Motorway Route Project Location**

The CCRA takes into consideration all project facilities as described in the Kınalı Malkara Motorway Project ESIA.

In particular, the CCRA focuses on Project components that could potentially be affected by climate-related hazards, related to motorway itself, the main structures of the motorway (overpasses, underpasses, culverts and interchanges), side infrastructures (such as light poles), motorway service facilities, energy transmission lines and substations.

### 1.3.1 Assessment of Hazards

#### *1.3.1.1 Climate Overview – Country level*

Türkiye is located between subtropical and temperate zones. It experiences Mediterranean, Black Sea, Terrestrial, and Marmara climates, with hot and dry summers, mild and rainy winters, cool summers with warm and snowy coastal winters, large temperature differences between seasons and days, and a transitional climate between the others. Türkiye experiences more rainfall in winter and spring, with less precipitation and higher temperature and evaporation in summer.

Tekirdağ has a temperate climate, with warm summers and mild winters. The region experiences a Mediterranean climate, characterized by hot, dry summers and mild, wet winters. The average temperature in the summer months of June to August is around 25°C, while the winter months of December to February have an average temperature of around 7°C. Tekirdağ receives moderate rainfall throughout the year, with the wettest months being November and December. The prevailing winds in the region are from the northwest, with occasional gusts from the south.

#### *1.3.1.2 Climate Overview – Local level*

A high-level characterization of the site climatology has been performed using the dataset from Copernicus ERA5-Land (European ReAnalysis version5). ERA5-Land provides hourly estimates of numerous atmospheric, terrestrial and oceanic climatic variables. The data covers the Earth on a 30 km grid and resolves the atmosphere using 137 levels from the surface to an altitude of 80 km. Information on uncertainties is also provided for variables with low spatial and temporal resolutions. Quality assured monthly updates of ERA5 (1959 to present) are released within 3 months in real time. Preliminary daily dataset updates are available to users within 5 days in real time.

**HISTORICAL TEMPERATURES**

The graph in Figure 3 shows the mean temperature (°C) from 1951 to 2020 with trend lines for different periods. The overall trend from 1951 to 2020 (yellow) indicates an increase in mean temperature, from about 13.5°C to approximately 15.0°C. The trend from 1971 to 2020 (green) shows a more significant increase, from around 13.5°C to 15.2°C. The most recent period from 1991 to 2020 (dark green) indicates an even steeper rise, starting from roughly 14.0°C to 15.6°C. These trends clearly suggest a significant long-term warming trend, with mean temperatures rising consistently, particularly in recent decades.

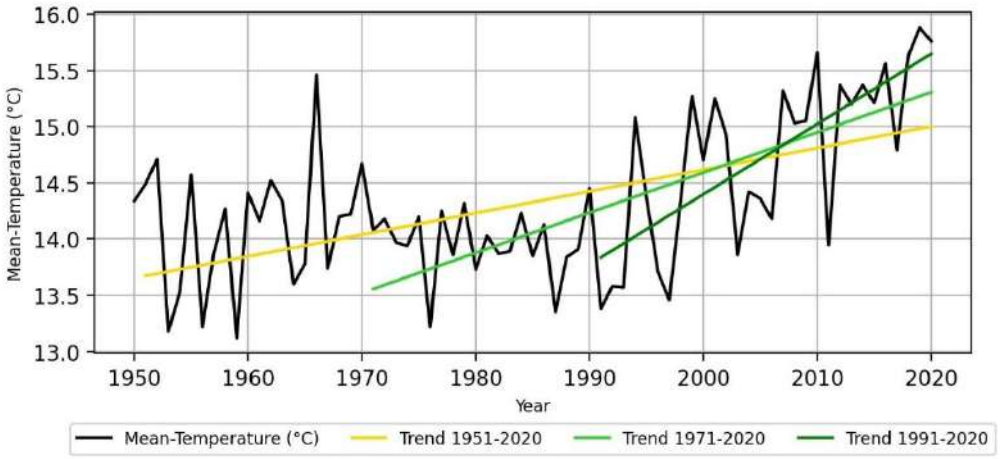



**Figure 3: Annual average in daily mean temperature in the historical period (1950-2020) from ERA5-Land.**

The graph in Figure 4 shows the maximum of daily maximum temperatures (°C) from 1951 to 2020 with trend lines for different periods. The overall trend from 1951 to 2020 (yellow) indicates a gradual increase, from about 33.5°C to approximately 34.5°C. The trend from 1971 to 2020 (green) shows a more noticeable increase, from around 34.0°C to 35.5°C. The most recent period from 1991 to 2020 (dark green) indicates a further rise, starting from roughly 34.0°C to 36.0°C. These trends suggest a long-term warming trend, with the maximum of daily maximum temperatures rising consistently, particularly in recent decades. This indicates that climate change has been contributing to higher peak temperatures over the observed period.

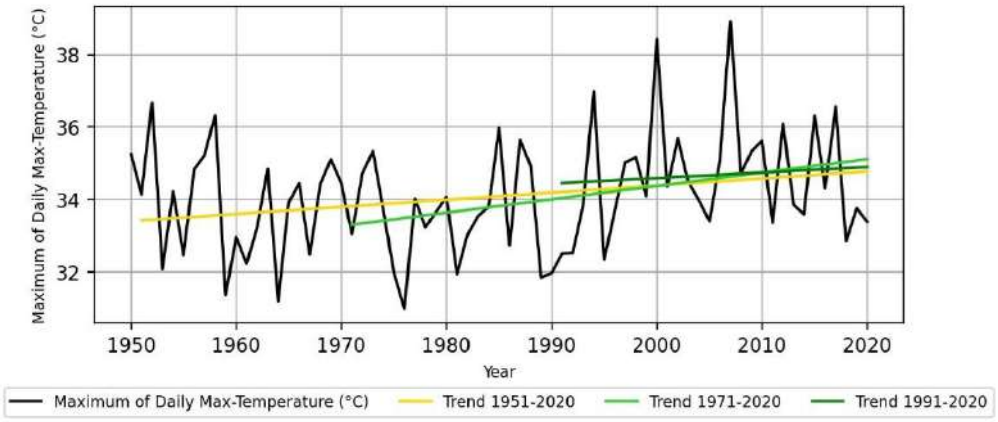



**Figure 4: Annual average in daily max temperature in the historical period (1950-2020) from ERA5-Land.**

## HISTORICAL PRECIPITATIONS

The graph in Figure 5 shows annual precipitation from 1951 to 2020 with trend lines for different periods. The overall trend from 1951 to 2020 (yellow) indicates a slight decrease in precipitation, from approximately 700 mm to around 650 mm. However, more recent periods (1991-2020 in dark green) show increasing trends, with the 1971-2020 period decreasing from about 670 mm to 630 mm and the 1991-2020 period rising from roughly 630 mm to 680 mm. This suggests a shift in climatic patterns with increased annual precipitation variability in recent decades. No significant long-term trends emerge, indicating that while there are periods of increase, the overall historical trend remains relatively stable.

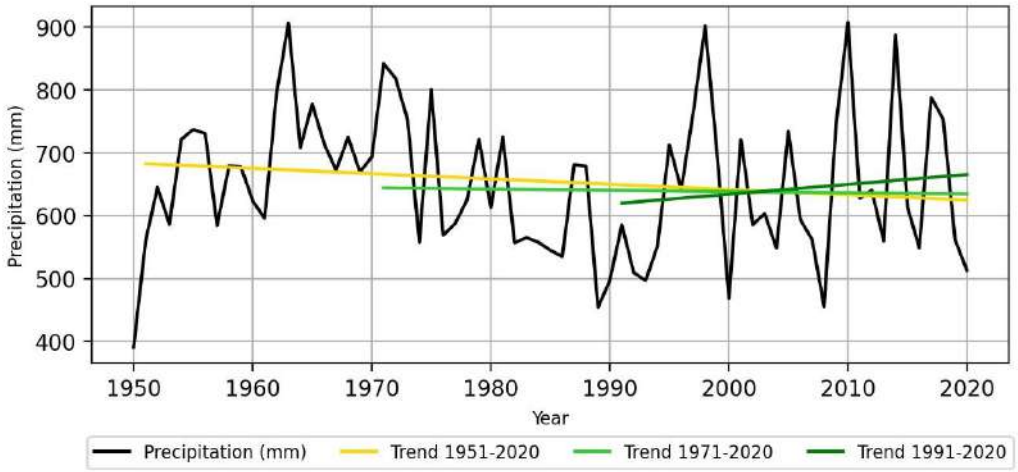



**Figure 5: Total annual precipitation in the historical period (1950-2020) from ERA5-Land.**

The graph in Figure 6 presents the largest 1-day precipitation events from 1951 to 2020, along with trend lines for different periods. The overall trend from 1951 to 2020 (yellow) shows a slight increase, from around 35 mm to about 37 mm. The trend from 1971 to 2020 (green) indicates a slight increase, from approximately 35 mm to 38 mm. The most recent period from 1991 to 2020 (dark green) also shows a slight decrease, starting from about 38 mm to 36 mm. These trends suggest that while there has been variability in the largest 1-day precipitation events, there is no significant long-term change, with recent decades showing a minor decrease in these extreme events.

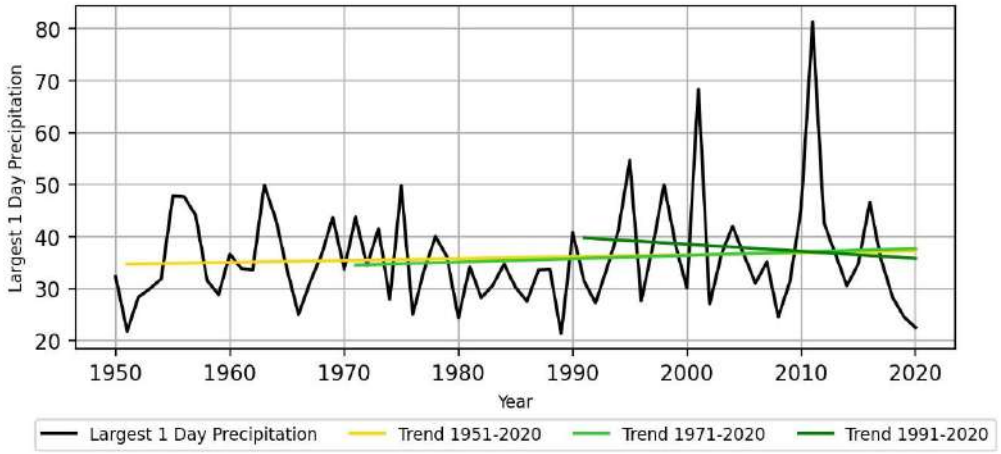



**Figure 6: Max 1 day precipitation in the historical period (1950-2020) from ERA5-Land.**

The graph in Figure 7 shows the maximum number of consecutive dry days from 1951 to 2020 with trend lines for different periods. The overall trend from 1951 to 2020 (yellow) indicates a slight decrease, from about 39 days to approximately 36 days. The trend from 1971 to 2020 (green) shows a small increase, from around 36 days to 37 days. The most recent period from 1991 to 2020 (dark green) shows a minor decrease, from roughly 38 days to 36 days. These trends suggest that while there has been some variability in the number of consecutive dry days, there is no significant long-term change, with recent decades showing a minor increase in the duration of dry periods. This indicates that climate variability has affected dry spells, but there is no substantial long-term trend in their length.

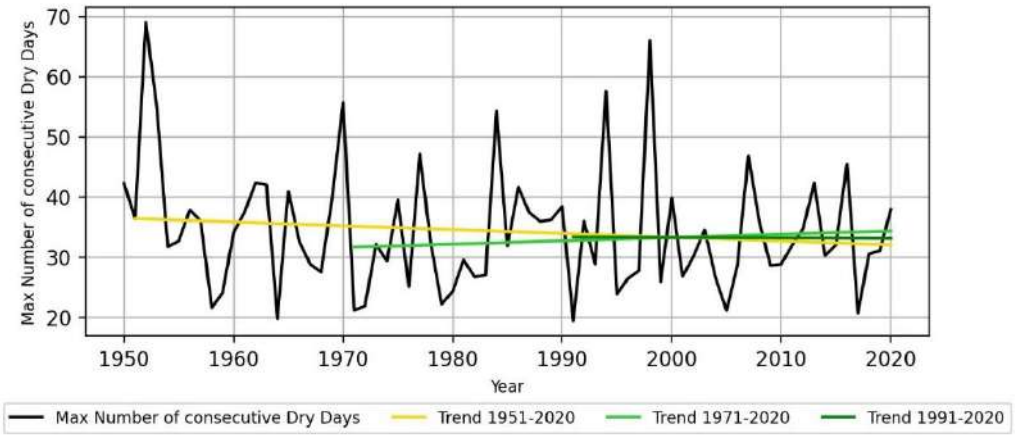



**Figure 7: Annual number of dry days in the historical period (1950-2020) from ERA5-Land.**

Climatic future projections have been assessed using data extracted from the **Coupled Model Intercomparison Project Phase 6 (CMIP6).** The downscaled version **Global Daily Downscaled Projections (NEX-GDDP-CMIP6)** produced and distributed by NASA has been used.

The extrapolated data refer to 3 possible $CO_2$ emission scenarios:

- SSP1 - 2.6 scenario (or SSP126), which foresees the drastic reduction of $CO_2$ emissions and the achievement of net zero emissions after 2050;
- SSP2 - 4.5 (or SSP245) scenario, assuming a reduction in $CO_2$ emissions without reaching net zero;
- SSP5 - 8.5 (or SSP585) scenario, which based on the hypothesis of doubling the current $CO_2$ emission levels by 2050.

The predicted median values are described for each variable considered and correspond to the functions represented through continuous lines in the graphs below. All forecast models consider 2015 as the starting year (the baseline year is 2014 and refers to the last historical data recorded).

In the evaluation of the historical period emerged that the area has experienced an increase in temperature, while water-related metrics does not show significant trends.

**FUTURE TEMPERATURES**

Average temperature is expected to increase in all considered scenarios as can be seen from Figure 8. In the SSP1-2.6 scenario, the increase is about 0.02°C/year, with the absolute temperature expected to reach around 16°C by 2100, with a 10th to 90th percentile range between 14.5°C and 17.5°C. In the SSP2-4.5 scenario, the projected increase is approximately 0.03°C/year, reaching about 17.5°C by 2100, with a range between 15.5°C and 18°C. In the SSP5-8.5 scenario, the increase is about 0.06°C/year, with temperatures potentially rising to around 21°C by 2100, and a range between 18°C and 21°C.

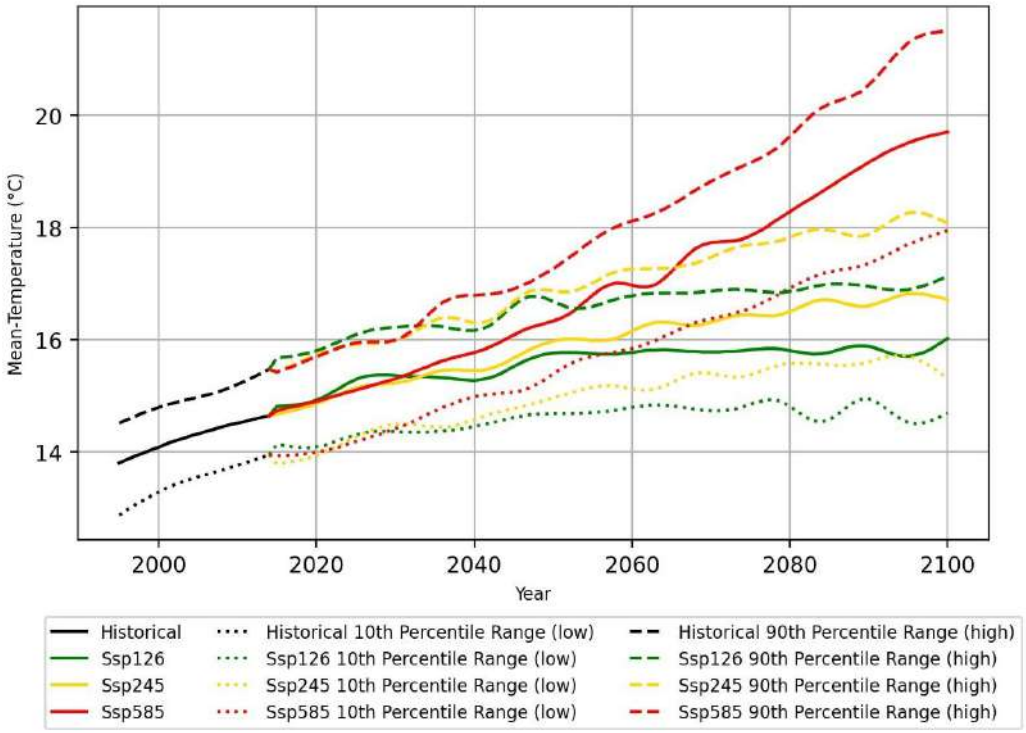



**Figure 8: Annual average temperature in climate models (CMIP6) for the historical period (1950-2014) and the future projections (2015-2100) in the three SSPs considered. Linear trends for the multi-model ensemble mean are highlighted.**

## FUTURE PRECIPITATIONS

Precipitation is projected to change under all considered scenarios as can be seen from Figure 9 In the SSP1-2.6 scenario, precipitation is expected to remain relatively stable around 580 mm/year, with slight fluctuations within a 10th to 90th percentile range of approximately 350 to 850 mm/year. In the SSP2-4.5 scenario, a slight decrease is projected, with precipitation dropping to around 550 mm/year by 2100, and a range between 520 and 580 mm/year. The SSP5-8.5 scenario predicts a more significant decrease, with precipitation expected to fall to around 450 mm/year by 2100, within a range of 450 to 580 mm/year.

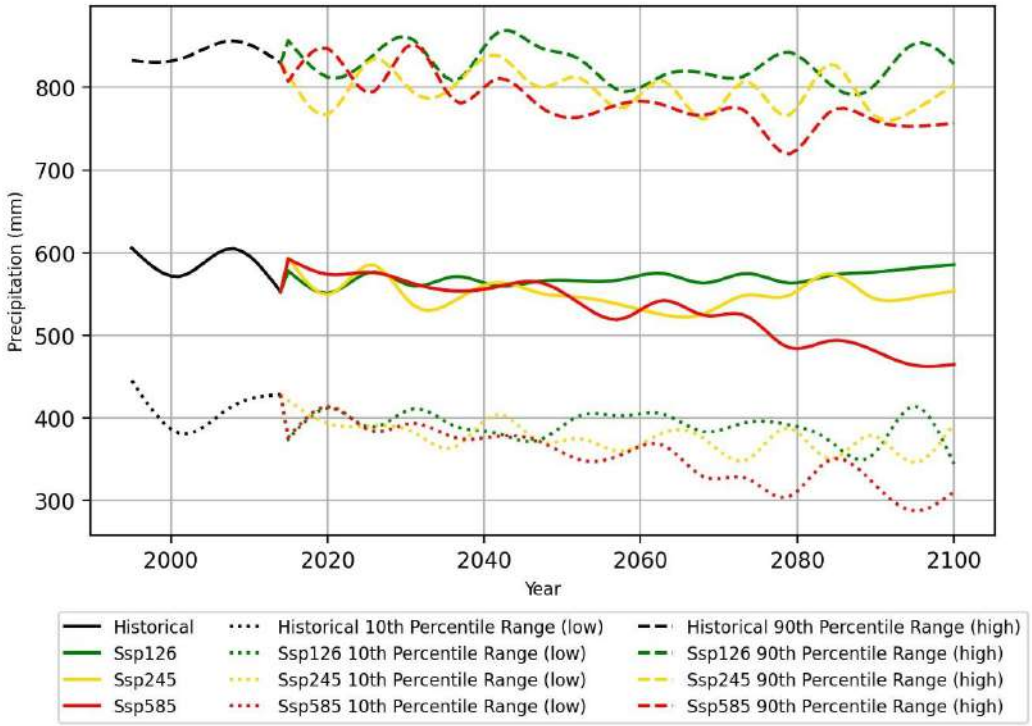



**Figure 9: Annual cumulated precipitation in climate models (CMIP6) for the historical period (1950-2014) and the future projections (2015-2100) in the three SSPs considered.**

#### *1.3.1.3 Identification of Relevant Climate-related Hazards*

According to ISO 14091, the first step in the CCRA requires to identify the climate-related hazards that may affect the Project Area and, among them, those the Project may be exposed to. Additional available literature (i.e., IPCC Report on Impacts, Adaptation and Vulnerability, UNEP Finance Initiative[6], World Bank National & Policy Climate and Disaster Risk Screening tool[7], ) was considered to define a framework and guide the hazard identification process.

Key questions to consider in the hazard identification process are the following:

- Which are the past events and what are the main issues that affected the site and may be related to climate change?
- Which are the climate-related hazards that may become relevant in the future?

Information from World Bank Group – Climate Change Knowledge Portal, Vulnerability section, were consulted to identify the most relevant hazards might be caused by climate change at the Country level. In addition to this, THINK HAZARD portal[8] (implemented by Global Facility for Disaster Reduction and Recovery (GFDRR) in collaboration with World Bank and providing high level hazard assessment worldwide) was used to refine the investigation at the level of the Tekirdağ Province.

[6] United Nations Environment Programme Finance Initiative (UNEP FI) is a partnership between UNEP and the global financial sector to mobilize private sector finance for sustainable development.

[7] Climate and Disaster Risk Screening represents a proactive approach to considering short- and long-term climate and disaster risks in project and national/sector planning processes.

[8] https://thinkhazard.org/en/

The outcomes of this processes resulted in the following list of selected hazards. They are listed together with the main justification for their inclusion in the risk assessment.

**Extreme Heat Hazard**

High temperatures are expected to increase faster than average temperatures. Thus, extreme heat hazards are expected to raise in frequency and intensity. Under the pessimistic scenario, this increase could double the number of hot days per year (T>35°C), exceeding the threshold of 100 days/year.

Even if there is a large spread between scenarios, the increase in average and maxima temperatures is expected to reach values hazardous to public health even under the optimistic scenarios. Therefore, this hazard has been scoped in for the climate change risk assessment.

**Extreme Cold Hazard**

The meteorological characteristics of Tekirdağ are characterized by a mild and temperate climate, with an average annual temperature of 15°C. The summers are warm with temperatures up to an average of 25°C, while the winters are cool with an average temperature around 5°C. As a consequence of overall increasing temperatures, extreme cold days will become less frequent in the future, according to all climate scenarios. Thus, extreme cold hazard has been scoped out for the climate change risk assessment.

**Wildfires Hazard**

According to the THINK HAZARD portal, the wildfire hazard in Tekirdağ is classified as high. This means there is greater than a 50% chance of encountering weather that could support a significant wildfire, likely resulting in both life and property loss in any given year. Damage can occur not only due to direct flame and radiation exposure but also from ember storms and low-level surface fires. Strong winds and windborne debris during extreme fire weather events may also weaken infrastructure integrity. Two neighbourhoods in Tekirdağ's Malkara district were evacuated in 2023 due to wildfires[9]. Therefore, this hazard has been scoped in for the climate change risk assessment.

**Strong Wind Hazard**

Strong winds may become more frequent or intense due to climate change in the region. This can exacerbate existing vulnerabilities and increase the frequency of hazards. Thus, this hazard has been scoped in for the climate change risk assessment.

**Severe Storms Hazard**

Increase in temperatures can enhance the atmospheric moisture and disrupt weather patterns, leading to more extreme and frequent storm events. Therefore, severe storms hazard has been scoped in for the climate change risk assessment.

**Extreme Precipitations Hazard**

Increase in temperatures is expected to probability of extreme weather events, including extreme precipitations. Therefore, this hazard has been scoped in for the climate change risk assessment.

**Flooding Hazard**

Tekirdağ Province is considered at high risk of flooding. Historical events have shown the region's vulnerability, with significant floods causing substantial damage to infrastructure and impacting local communities. Notably,

[9] https://www.independent.co.uk/news/world/europe/europe-heatwave-wildfires-pictures-greece-b2377178.html

severe weather in early September 2009 produced record-setting rainfall amounts across the Marmara region, leading to a series of flash floods that severely affected İstanbul and Tekirdağ provinces[10]. Climate change is expected to increase the frequency and intensity of extreme precipitation events, leading to more frequent and severe flooding.

Flood hazard is classified as high based on modelled flood information currently available to **THINK HAZARD portal**. This means that potentially damaging and life-threatening urban floods are expected to occur at least once in the next 10 years. Therefore, this hazard has been scoped in for the climate change risk assessment.

**Drought Hazard**

Drought events may become more frequent and intense since higher temperatures can lead to greater evaporation rates, reducing soil moisture and water availability. Additionally, shifting precipitation patterns may result in less reliable rainfall, making dry periods more frequent and severe. Therefore, drought hazard has been scoped in for the climate change risk assessment.

**Landslide Hazard**

The landslide hazard was evaluated within the Section 7.1.2 of the ESIA Report and also determined to be an indirect impact, primarily linked to extreme precipitation and severe storms. Given that landslides typically result from intense rainfall events rather than drought or other conditions, this risk is closely tied to weather extremes such as severe storms. Additionally, there is no Jupiter data available to provide future forecasts for such events, which limits the ability to precisely predict landslide risks over time. Therefore, landslides are considered a potential indirect impact tied to extreme precipitation and severe storms rather than a primary concern for the Project. Therefore, landslide hazard has been scoped out from the risk assessment.

**Erosion Hazard**

The erosion hazard was evaluated within the Sections 7.1.3 and 7.1.4 of the ESIA Report and also identified as an indirect impact, primarily associated with extreme precipitation and severe storms. Erosion risks are closely linked to heavy rainfall and storm events, which can increase surface runoff and soil degradation. Additionally, there is no Jupiter data available to provide future forecasts for such events, which limits the ability to precisely predict erosion risks over time. As a result, erosion is considered a potential indirect impact tied to extreme precipitation and severe storms rather than a primary concern for the Project. Therefore, erosion hazard has been scoped out from the risk assessment.

**Sea Level Rise Hazard**

According to the **THINK HAZARD portal**, coastal flood within the Project Area is classified as very low. This means that there is less than a 10% chance of potentially-damaging waves occurring in the next 10 years. Additionally, according to the **Climate Central**, based on the IPCC 2021 projections no sea level rise is anticipated for the Project Area (especially for the sections of the route around KM: 50+000) throughout the Project lifetime. The projections indicate that while global sea levels are expected to rise, Tekirdağ's coastal region will not experience any changes that could impact the infrastructure or operations of the Project. As a result, sea level rise has been scoped out from the climate change risk assessment.

[10]https://www.researchgate.net/publication/257632799_Analysis_of_the_Marmara_flood_in_Turkey_7-10_September_2009_An_assessment_from_hydrometeorological_perspective

#### 1.3.1.4 Exposure Assessment

Once hazards potentially affecting the Project Area were identified, the exposure of the Project to each hazard was assessed. The key question in the exposure assessment is the following:

- In case of any of the selected climate-related hazard hitting the Project Area, would the Project be impacted?

The evaluation in Table 1 considered the intrinsic characteristics and features of the Project.

**Table 1: Exposure assessment**

| Exposure | | |
|---|---|---|
| HAZARD | EXPOSURE (YES/NO) | RATIONALE FOR EXPOSURE |
| **Extreme Heat** | YES | Extreme heat would accelerate the deterioration of the road. Users would certainly be affected by extremely high temperatures as well. |
| **Wildfire** | YES | In case of wildfires both users and infrastructures would be affected. |
| **Strong Wind** | YES | Strong wind conditions could cause trees or light poles to fall on the road, resulting in service disruptions and damages to infrastructures, representing a potential threat for users as well. |
| **Severe Storms** | YES | Severe storms characterized by intense precipitations and strong wind could cause flooding, trees or light poles to fall on the road and other disruptions, representing a potential threat for users as well. |
| **Extreme Precipitations (rain)** | YES | Extreme precipitations could affect the road surface, with flooding and related disruptions and interruptions, representing a potential threat for users as well. |
| **Flooding** | YES | In case of flooding the road would certainly be exposed as water could damage the infrastructure and create disruptions to users. |
| **Drought** | NO | Drought could potentially expose the motorway and its structures to indirect challenges, such as soil instability or changes in groundwater levels, which may affect the surrounding environment or require additional maintenance efforts.<br><br>However, motorway is designed to withstand a variety of weather conditions, including dry spells, and the materials used in its construction, such as asphalt and concrete, are resilient to a range of temperatures and weather variations. While the climate where the Project is located, includes hot, dry summers, it does not experience extreme or prolonged droughts that would threaten the structural integrity of the motorway. Short-term drought conditions do not directly impact the durability of the motorway or its materials, as they are built to endure such variations. Therefore, drought is not considered a significant risk to the Project. |

The Project was considered exposed to all relevant climate-related hazards potentially affecting the Project Area. Therefore, all of them were scoped in for further assessment.

#### 1.3.1.5 Hazards Input Data

Climate Score Global 2.7, implemented by Jupiter Intelligence[11], was used as the data source for assigning a class of either probability or intensity to each scoped-in climate-related hazard.

Climate Score Global quantifies climate-related hazards at any given location globally predicting how future climate conditions will influence the intensity or the frequency of extreme meteorological events or natural disasters such as future floods, extreme heat events and droughts. The tool employs dozens of respected climate models coupled with machine learning, land use and elevation data, as well as models for hydrology, and severe weather. Data present a very high spatial resolution (90-meter globally), quantifying a set of hazards-specific metrics in 5-year increments from 2020 through 2100 (plus the baseline 1995 which was evaluated and incorporated by Climate Score Global itself for the future predictions) and for three climate scenarios, made by a combination of Shared Socioeconomic Pathways (SSPs) and Representative Concentration Pathways (RCPs) [12]:

- Optimistic scenario: projected socioeconomic global changes towards sustainability (SSP1). Carbon dioxide emissions start declining by 2020 and go to zero by 2100 (RCP2.6).
- Intermediate scenario: projected socioeconomic global changes do not shift markedly from historical patterns (SSP2). Emissions reach the peak around 2040, then decline (RCP4.5).
- Pessimistic scenario: projected socioeconomic global changes towards deeper fossil-fuelled development (SSP5). Emissions continue to rise throughout the entire 21st century (RCP8.5).

Data come in a spreadsheet where a representative location of the Project (identified with longitude and latitude coordinates) is assigned multiple metrics (data type numerical values or bands) and qualitative classes for each hazard.

Table 2 shows as an example the metrics provided to characterize the Extreme Heat hazard while Figure 10 provides an example of classification criteria:

**Table 2: Overview of all metrics provided to characterize the Extreme Heat hazard**

| Metric | Description | Example |
|---|---|---|
| HT_days Exceeding*C_mean | Days per year with temperature >35°C or >38°C based on the mean of the high temperature distribution from Global Circulation Models 13(GCMs). | 14 |
| HT_days Exceeding*C_band | Band that HT_daysExceeding*C_mean maps to. | 10-20 days |
| HT_days Exceeding*C_lower | Days per year with temperature >35°C or >38°C based on the 5th percentile of the high temperature distribution from GCMs. | 10 |
| HT_days Exceeding*C_upper | Days per year with temperature >35°C or >38°C based on the 95th percentile of the high temperature distribution from GCMs. | 19 |

[11] Climate Score Global https://jupiterintel.com/products/

[12] Shared Socioeconomic Pathways (SSPs) are scenarios of projected socioeconomic global changes up to 2100. They are used to derive greenhouse gas emissions scenarios with different climate policies. Representative Concentration Pathways (RCPs) are greenhouse gas concentration possible future trajectories adopted by the IPCC.

[13] Global Circulation Models (GCMs) are numerical models representing physical processes in the atmosphere, ocean, cryosphere and land surface. They are the most advanced tools currently available for simulating the response of the global climate system to increasing greenhouse gas concentrations.

| Metric | Description | Example |
|---|---|---|
| HT_daysExceeding99Pct_mean | Days per year with temperature exceeding the local historical 99th percentile temperature based on the mean of the high temp. distribution from GCMs. | 5 |
| HT_daysExceeding99Pct_band | Band that HT_daysExceeding99Pct_mean maps to. | 5-10 days |
| HT_daysExceeding99Pct_lower | Days per year with temperature exceeding the local historical 99th percentile temperature based on the 5th percentile of the high temperature distribution from GCMs. | 7 |
| HT_daysExceeding99Pct_upper | Days per year with temperature exceeding the local historical 99th percentile temperature based on the 95th percentile of the high temperature distribution from GCMs | 1 |

| Metric | Tier | Label | Min Value | Max Value |
|---|---|---|---|---|
| daysExceeding*C daysExceeding99Pct | Lowest | < 5 days | 0 | 5 |
| daysExceeding*C daysExceeding99Pct | Low | 5-10 days | 5 | 10 |
| daysExceeding*C daysExceeding99Pct | Medium | 10-20 days | 10 | 20 |
| daysExceeding*C daysExceeding99Pct | High | 20-30 days | 20 | 30 |
| daysExceeding*C daysExceeding99Pct | Highest | > 30 days | 30 | 365 |

**Figure 10: Classification criteria for the metrics of Extreme Heat hazard.**

### *1.3.1.6 Hazards Characterization*

Considering the significant extension of the road a multi-location approach has been adopted for characterizing hazards. Jupiter's Hazard Input data were obtained for the 20 locations distributed with 5 km spacing along the road, identified through their coordinates. The locations selected for the hazard characterization is presented in the Figure 11 below.

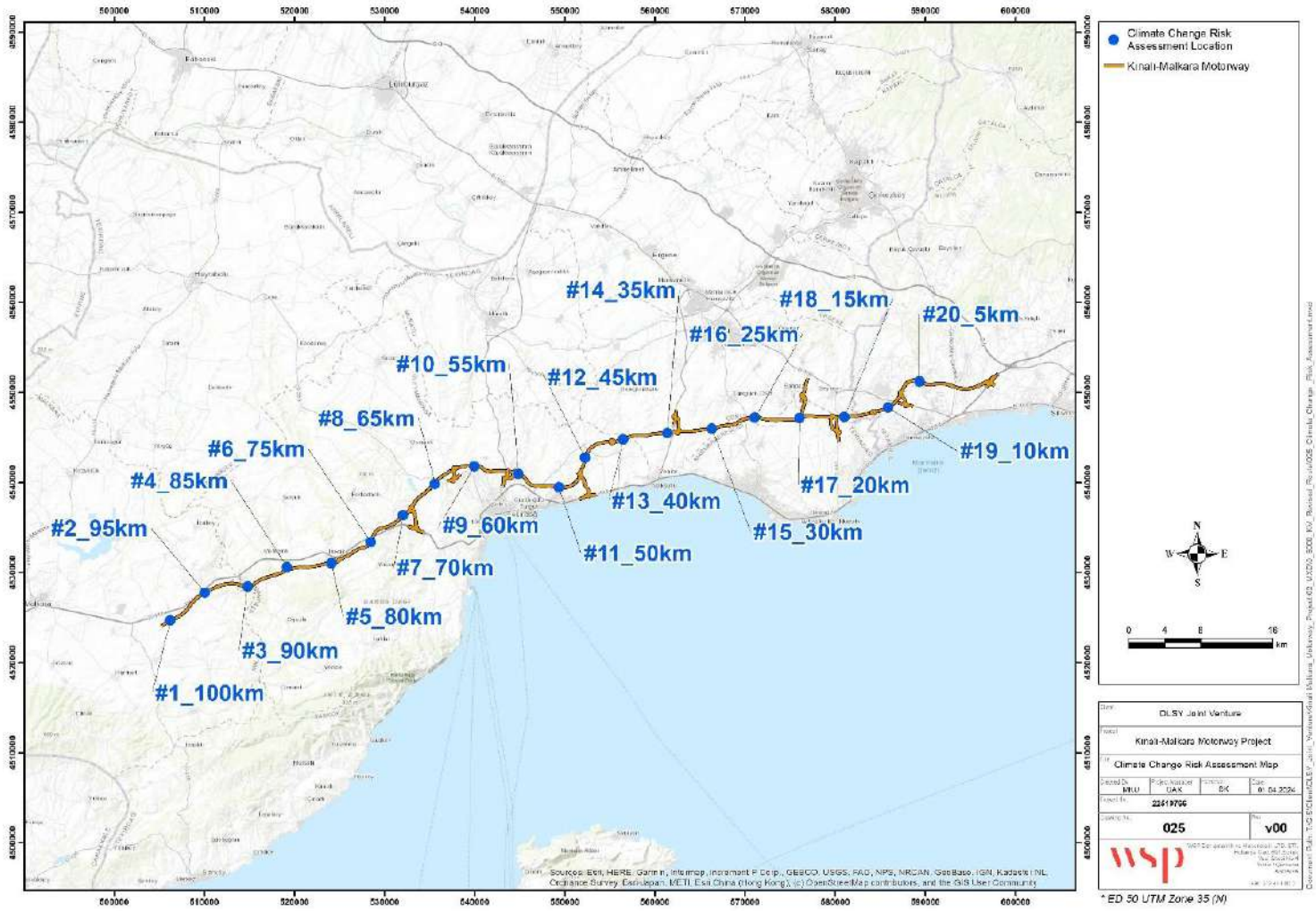



**Figure 11: Locations selected for hazard characterization in the Climate Change Risk Assessment**

Among all possible metrics available, the most representative were selected for each hazard. They are shown in Table 3.

**Table 3: Most representative metrics selected to characterize each hazard**

| HAZARD | METRIC |
|---|---|
| **Extreme Heat** | Days per year with temperature exceeding the local historical 99$^{th}$ percentile temperature. |
| **Wildfires** | Mean annual number of wildfires, which ignite and grow to detectable size, that are expected in a 1 sq km grid cell. |
| **Strong Wind** | Maximum 1-minute sustained wind speed (in km/hr) experienced at the 100-year return period. |
| **Severe Storms** | Number of days per year where environmental conditions are conducive to severe thunderstorm formation. |
| **Extreme Precipitations (rain)** | Maximum daily total water equivalent precipitation (in mm) experienced at the 100-year return period. |
| **Flooding** | Mean depth of the water (in meters) at the 100-year return period. |

According to the Hazard input data and the metrics considered, the following are the main considerations to describe the scoped-in hazards and their evolution over time at the Project Area. For each Hazard, the related figure shows the evolution across the time period covered by Jupiter data.

The temporal scope of the assessment covers the period 2020-2100.This temporal scope seems extended enough considering that a road infrastructure project for its own intrinsic characteristics and purpose does not have a predetermined life span but it is expected to be designed and built to last as much as possible.

According to the selected metrics and the scenarios available, the following are the main considerations to describe the level of each hazard at present and in the future according to all emission scenarios available. Horizontal grey dashed lines represent the hazard class limits.

**EXTREME HEAT HAZARD**

Extreme Heat is a significant hazard at the Project Area. According to the selected metric and classification criteria given below, the number of days with temperatures above the local average maximum temperatures increases in all locations during the temporal scope and for all scenarios. For the optimistic scenario, in 2040 the hazard level for all locations is between low and medium. In the intermediate scenario the trend is similar but with higher increase, in particular after 2060, numbers are significantly higher for all locations compared to the optimistic scenario. The trend again is similar but with an even higher increase for the pessimistic scenario. In 2100, all locations are in the “High” hazard level.

**Table 4: Classification criteria for the Extreme Heat Hazard according to Jupiter Intelligence**

| Hazard Level | Threshold |
|---|---|
| Highest | > 30 days |
| High | 20-30 days |
| Medium | 10-20 days |

| Hazard Level | Threshold |
|---|---|
| Low | 5-10 days |
| Lowest | < 5 days |

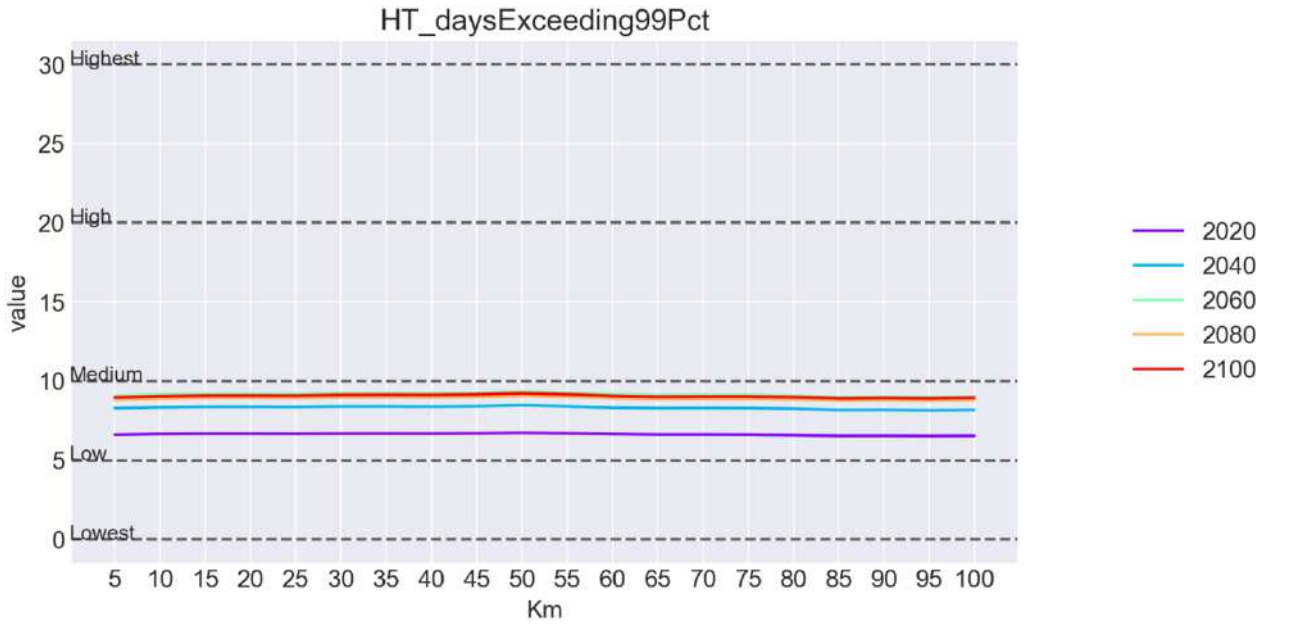



**Figure 12: Extreme Heat hazard, represented by the number of days per year with temperature exceeding the local historical 99th percentile temperatures – Optimistic Scenario.**

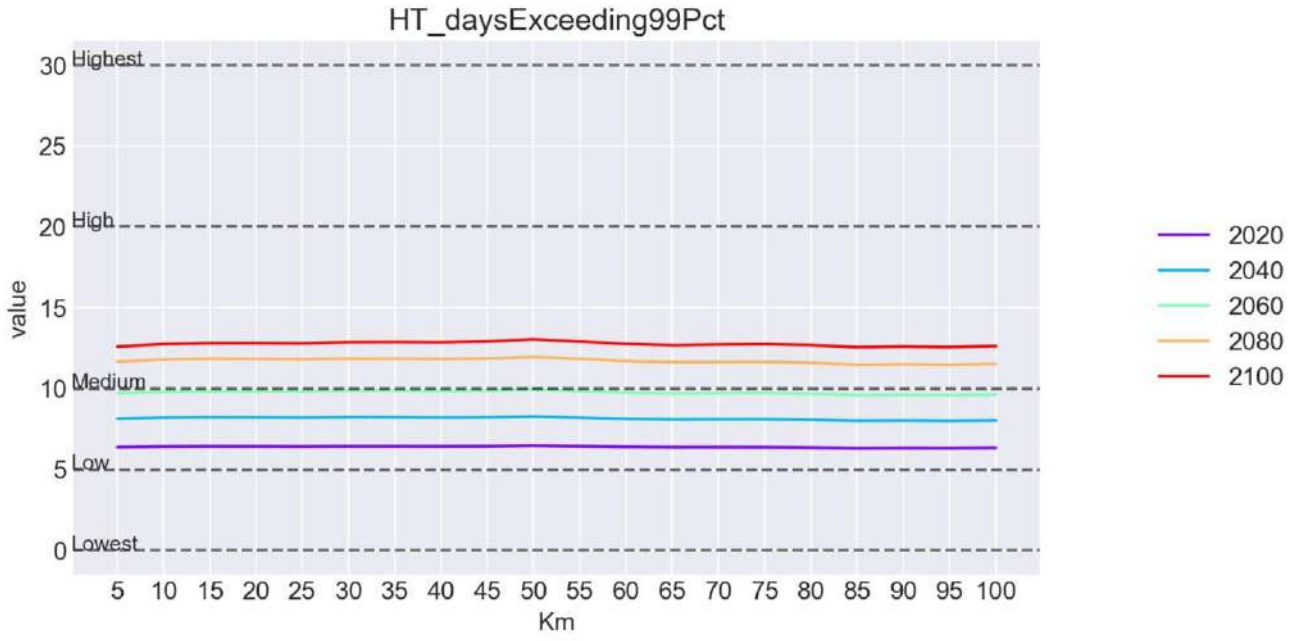



**Figure 13: Extreme Heat hazard, represented by the number of days per year with temperature exceeding the local historical 99th percentile temperatures – Intermediate Scenario.**

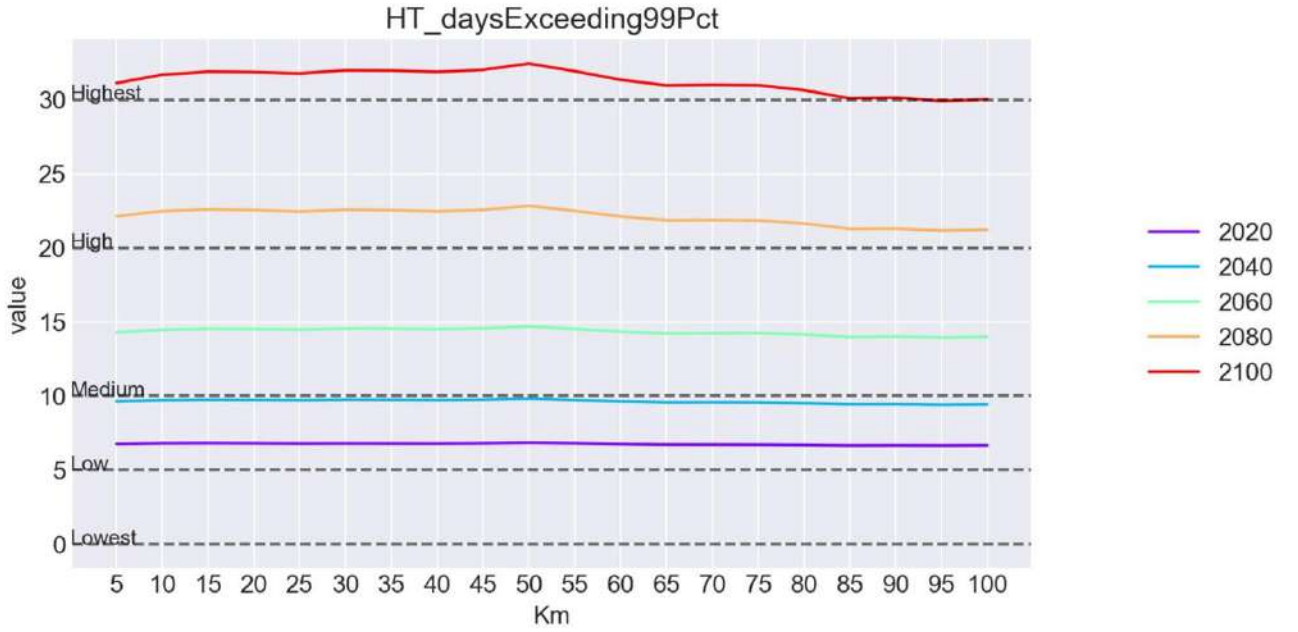



**Figure 14: Extreme Heat hazard, represented by the number of days per year with temperature exceeding the local historical 99th percentile temperatures – Pessimistic Scenario.**

**WILDFIRE HAZARD**

Wildfire hazard is a relevant hazard for the Project according to Jupiter data. The trend is increasing along the road in all scenarios and the hazard level changes between “Low” to “High” according to classification criteria given below.

**Table 5: Classification criteria for the Wildfire Hazard according to Jupiter Intelligence**

| Hazard Level | Threshold |
|---|---|
| Highest | > 20 fires |
| High | 8-20 fires |
| Medium | 4-8 fires |
| Low | 2-4 fires |
| Lowest | < 2 fires |

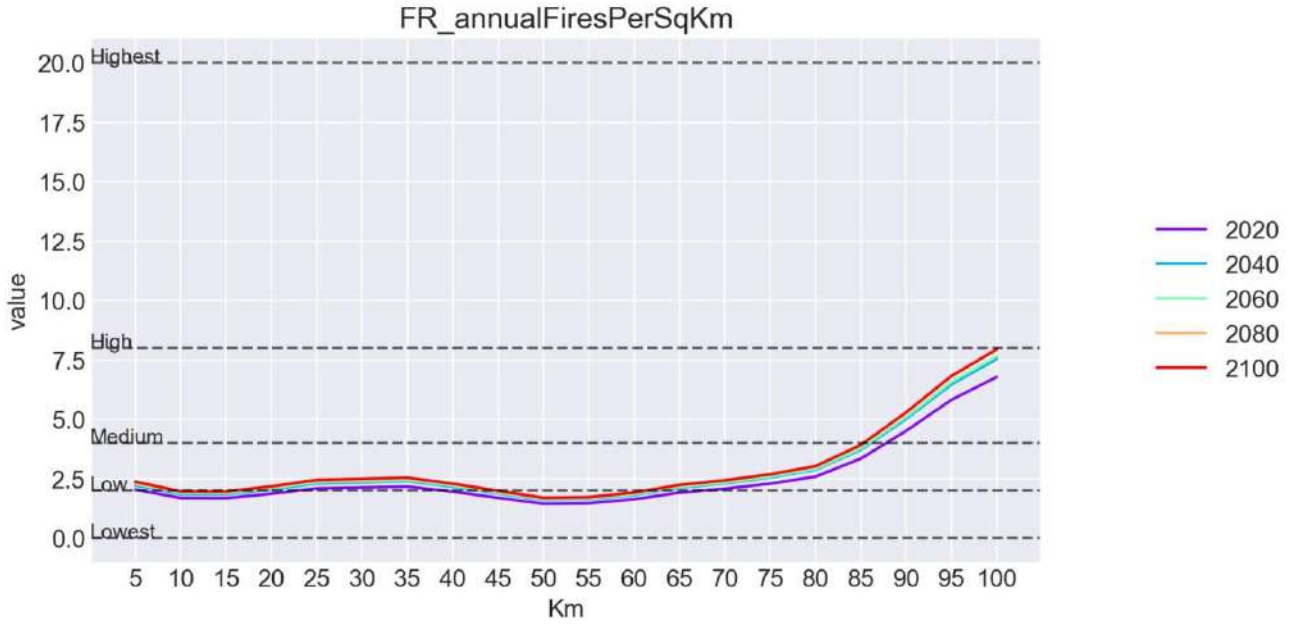



**Figure 15: Wildfire hazard, represented by mean annual number of wildfires that are expected in a 1 sq km grid cell – Optimistic Scenario.**

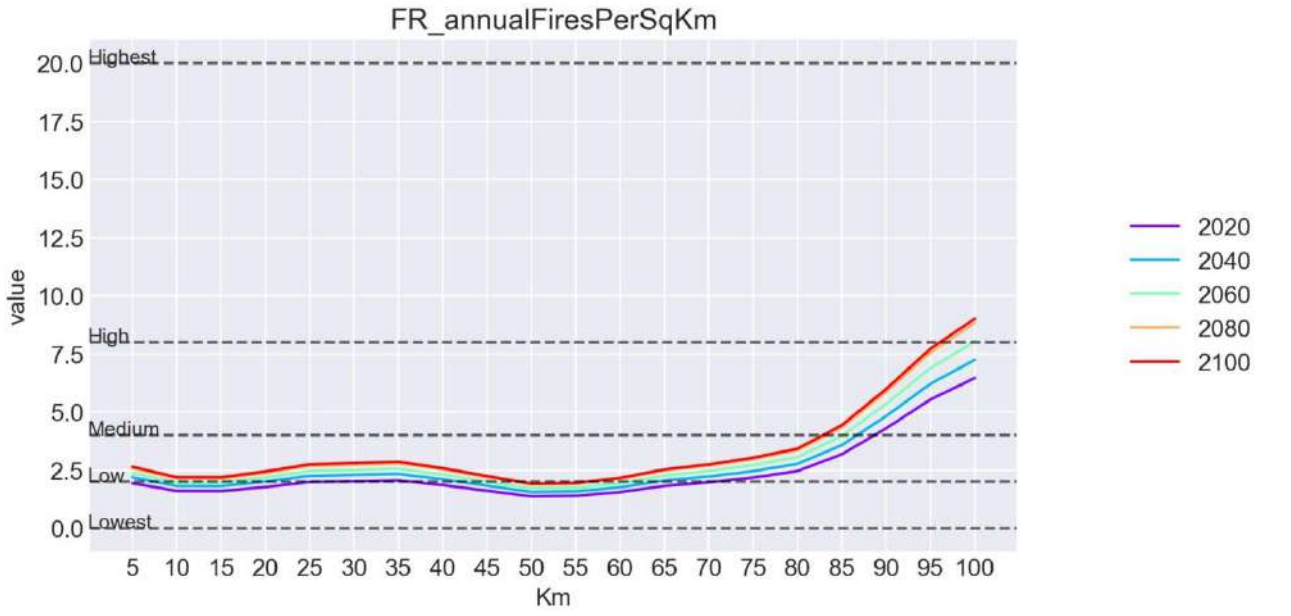



**Figure 16: Wildfire hazard, represented by mean annual number of wildfires that are expected in a 1 sq km grid cell – Intermediate Scenario**

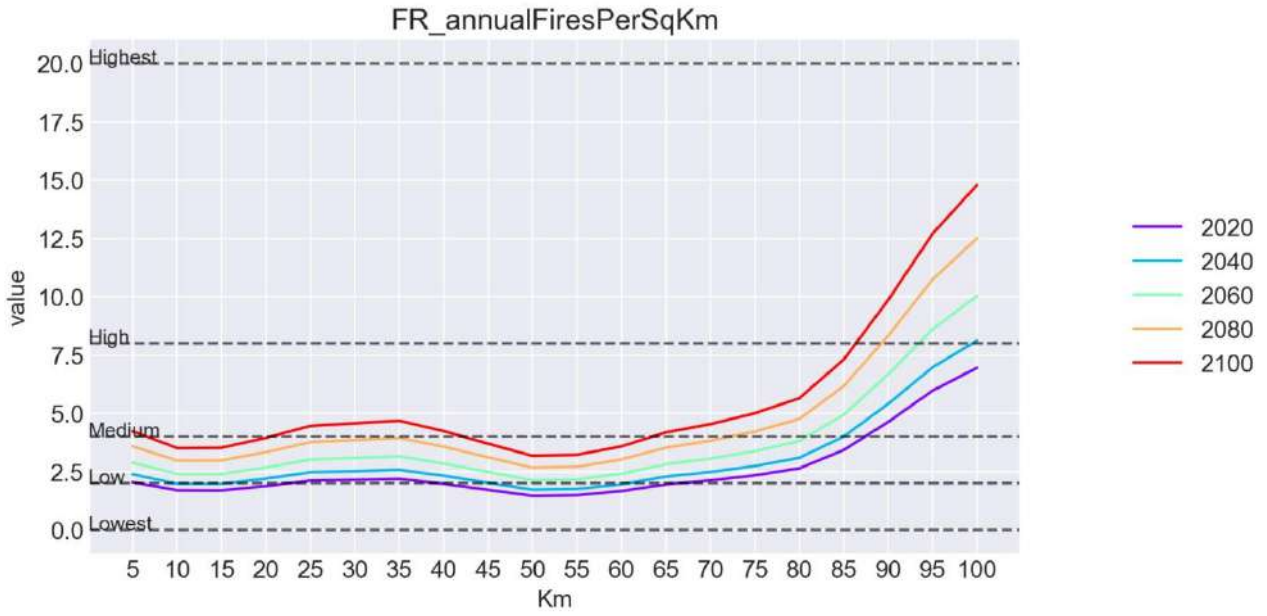



**Figure 17: Wildfire hazard, represented by mean annual number of wildfires that are expected in a 1 sq km grid cell – Pessimistic Scenario**

**STRONG WIND HAZARD**

Strong Wind is a relevant hazard for the Project. Values of the selected metric (maximum 1-minute sustained wind speed (in km/h) experienced at the 100-year return period) are around 75-100 km/h) which is classified as between “Low” and “Medium” hazard level for all scenarios according to classification criteria given below.

For all scenarios and for the entire temporal scope of this assessment, values are projected to remain stable, this is the reason why the three charts look similar and the lines related to different temporal scopes are overlapping.

**Table 6: Classification criteria for the Strong Wind Hazard according to Jupiter Intelligence**

| Hazard Level | Threshold |
|---|---|
| Highest | >178 km/h |
| High | 119-178 km/h |
| Medium | 90-119 km/h |
| Low | 63-90 km/h |
| Lowest | < 63 km/h |

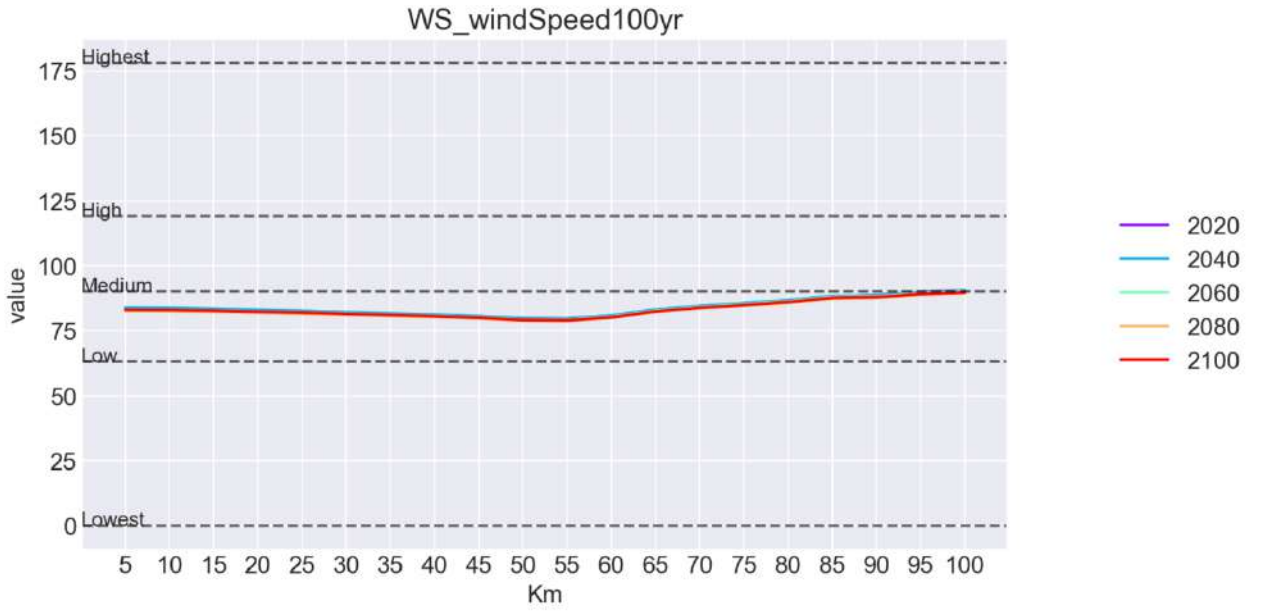



**Figure 18: Strong Wind hazard represented by the maximum 1-minute sustained wind speed (in km/hr) experienced at the 100-year return period – Optimistic Scenario**




**Figure 19: Strong Wind hazard represented by the maximum 1-minute sustained wind speed (in km/hr) experienced at the 100-year return period – Intermediate Scenario**




**Figure 20: Strong Wind hazard represented by the maximum 1-minute sustained wind speed (in km/hr) experienced at the 100-year return period – Pessimistic Scenario**

## SEVERE STORMS HAZARD

Severe Storms is a significant hazard according to Jupiter data and classification criteria given below. For both the intermediate and pessimistic scenarios, the level is expected to increase during the temporal scope. Dataset shows a gradual decrease throughout the road.

**Table 7: Classification criteria for the Severe Storms Hazard according to Jupiter Intelligence**

| Hazard Level | Threshold |
|---|---|
| Highest | > 30 days |
| High | 20 - 30 days |
| Medium | 10 - 20 days |
| Low | 5 - 10 days |
| Lowest | < 5 days |

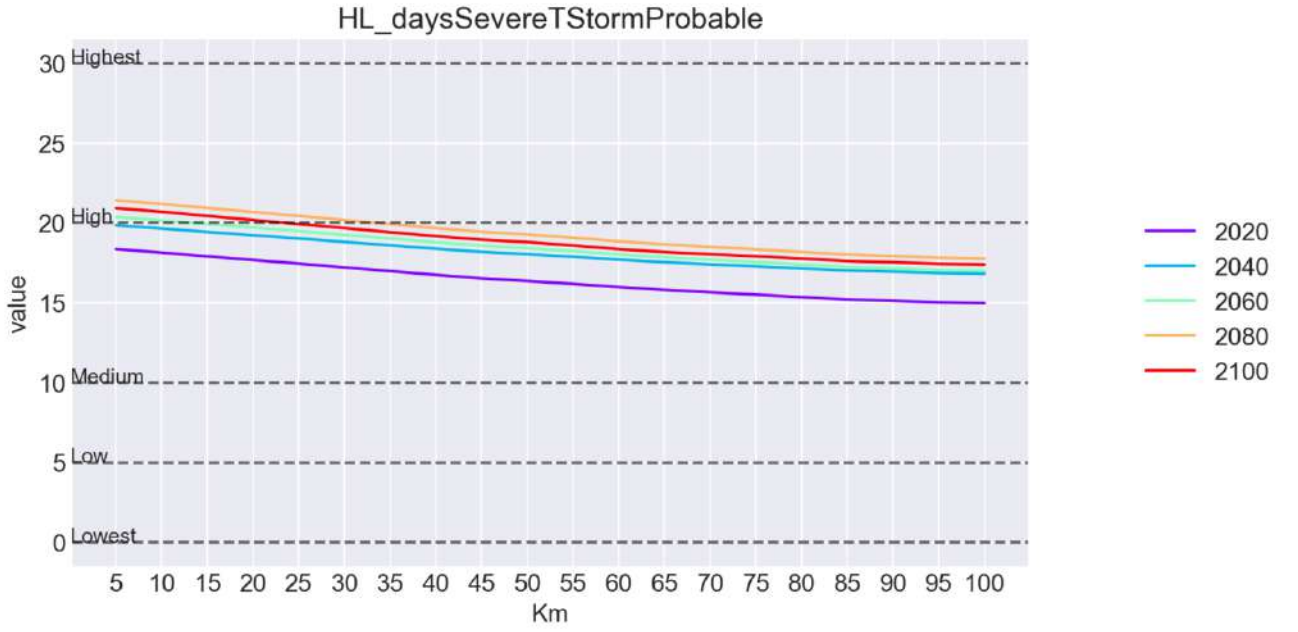



**Figure 21: Severe storms hazard, represented by the number of days per year where environmental conditions are conducive to severe thunderstorm formation – Optimistic Scenario.**

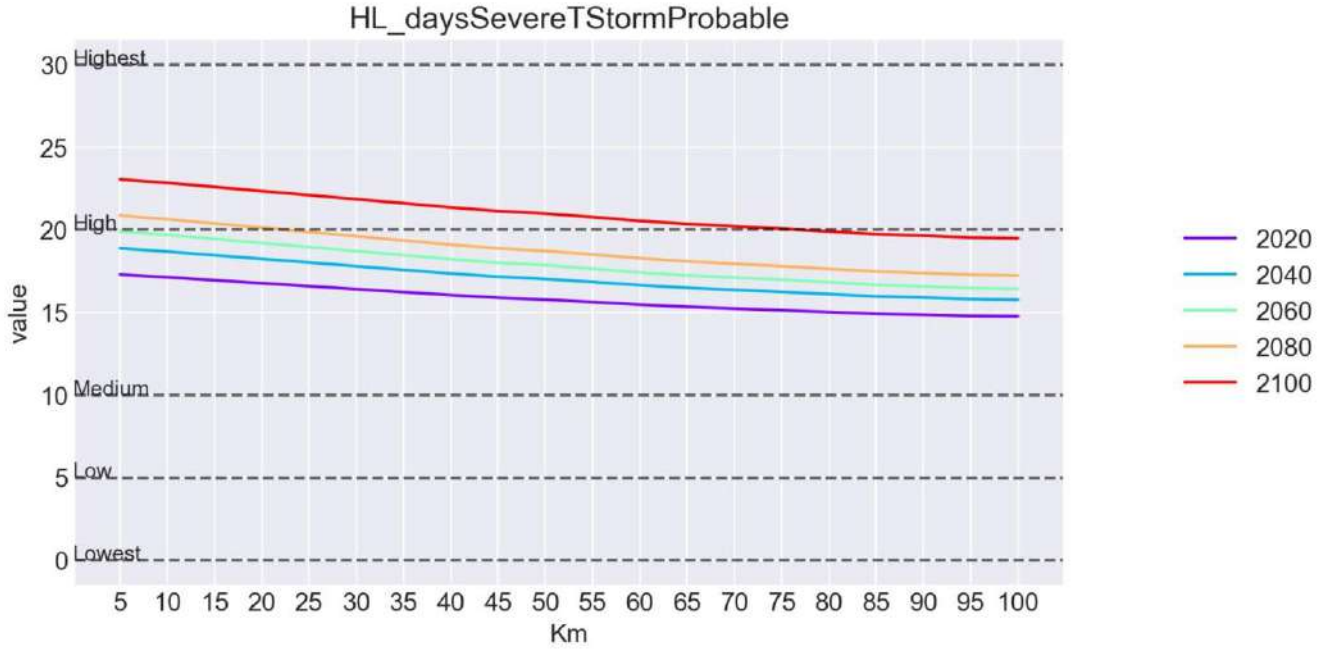



**Figure 22: Severe storms hazard, represented by the number of days per year where environmental conditions are conducive to severe thunderstorm formation – Intermediate Scenario**

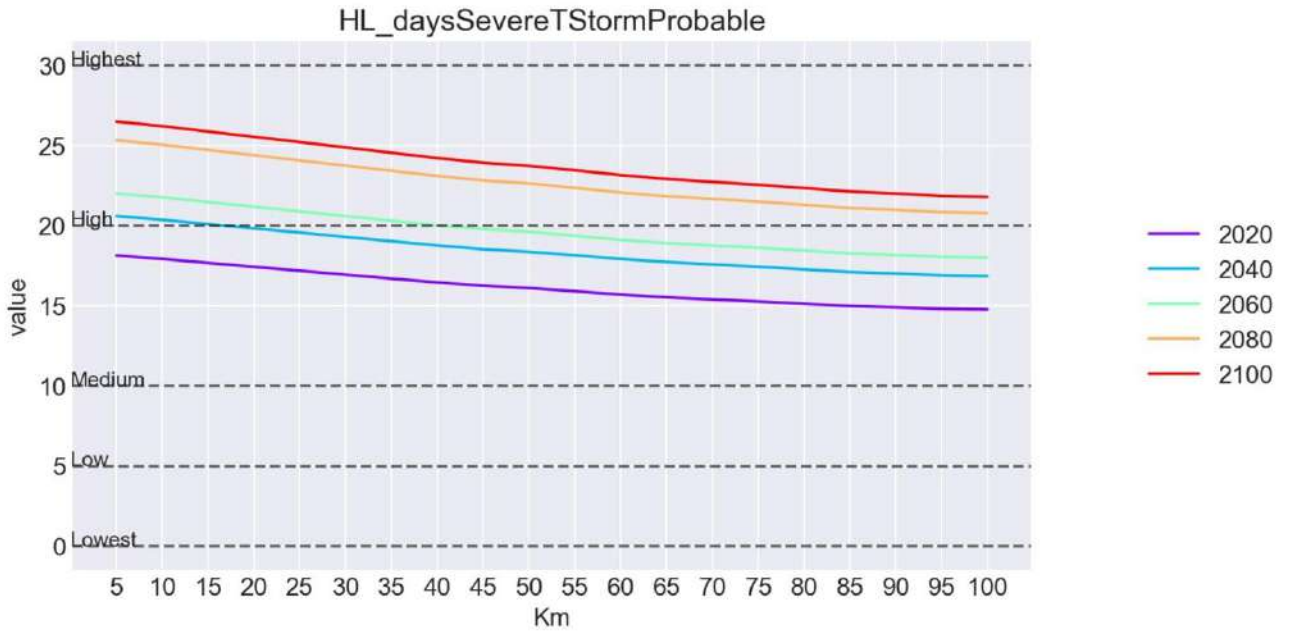



**Figure 23: Severe storms hazard, represented by the number of days per year where environmental conditions are conducive to severe thunderstorm formation – Pessimistic Scenario**

**EXTREME PRECIPITATIONS (RAIN)**

Extreme precipitation is a relevant hazard according to Jupiter data. For the future, no matter the emission scenarios, values remain stable and falls within the “Medium” hazard level according to classification criteria given below.

**Table 8: Classification criteria for the Extreme Precipitations Hazard according to Jupiter Intelligence**

| Hazard Level | Threshold |
|---|---|
| Highest | > 250 mm |
| High | 200-250 mm |
| Medium | 150-200 mm |
| Low | 100-150 mm |
| Lowest | < 100 mm |

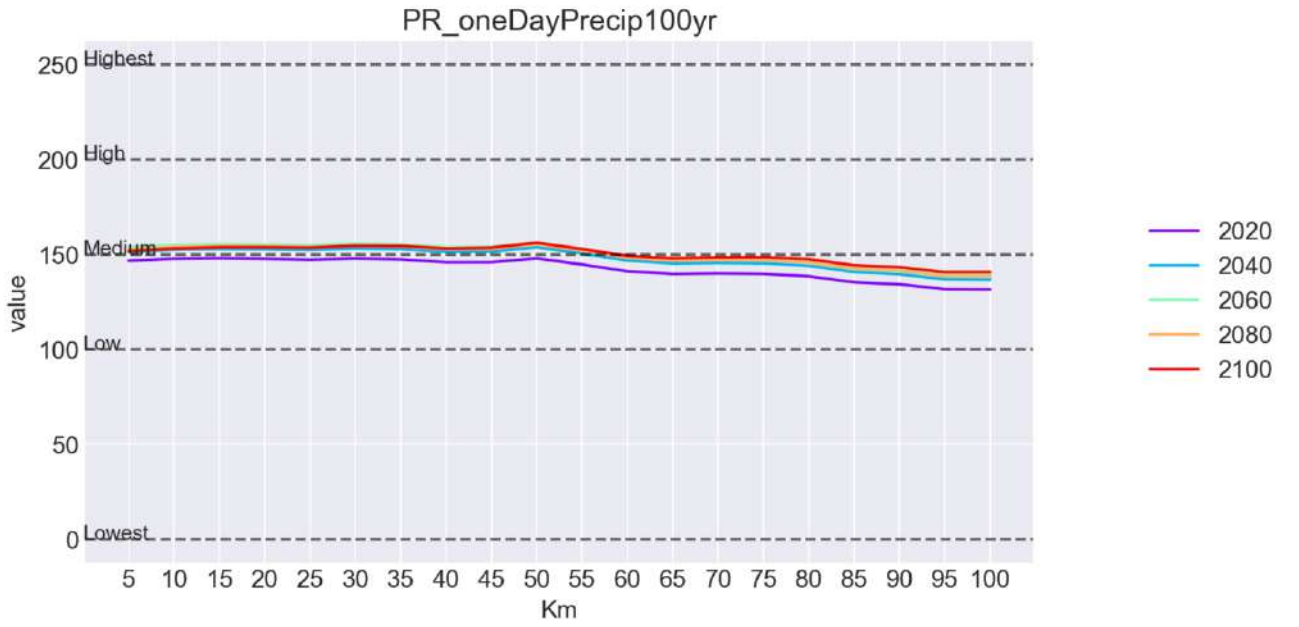



**Figure 24: Extreme precipitation (rain) hazard, represented by the maximum daily total water equivalent precipitation experienced at the 100-year return period – Optimistic Scenario.**




**Figure 25: Extreme precipitation (rain) hazard, represented by the maximum daily total water equivalent precipitation experienced at the 100-year return period – Intermediate Scenario**

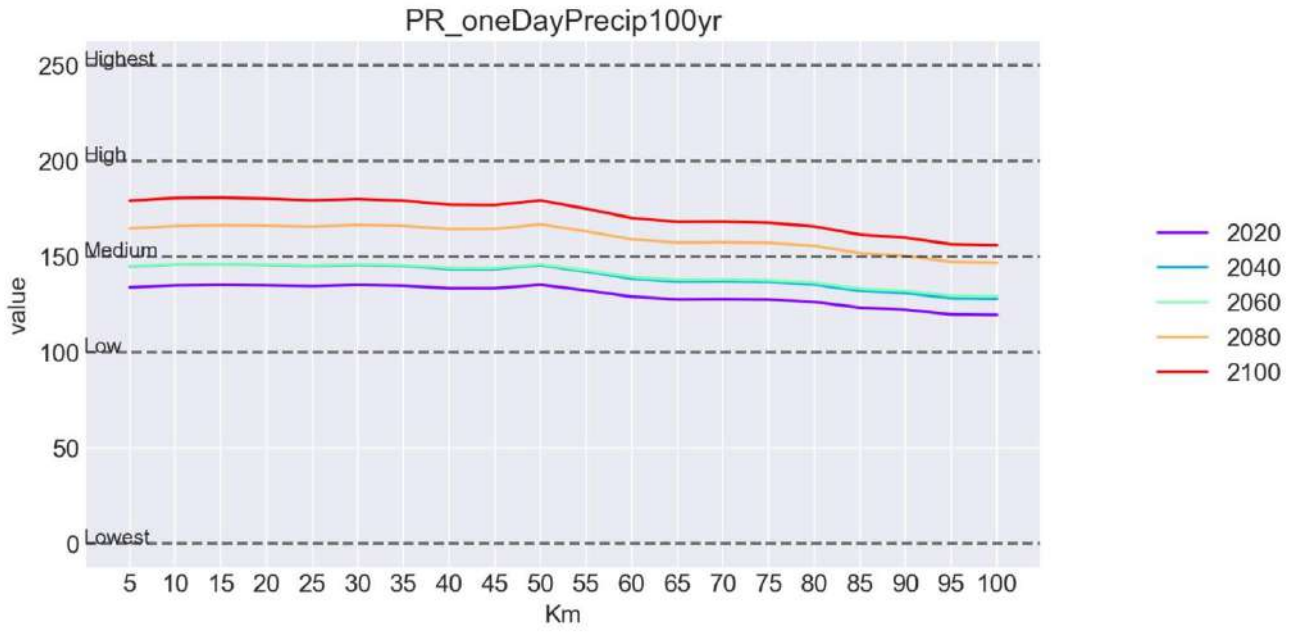



**Figure 26: Extreme precipitation (rain) hazard, represented by the maximum daily total water equivalent precipitation experienced at the 100-year return period – Pessimistic Scenario**

## FLOODING HAZARD

Flooding hazard is a relevant hazard for the Project. The hazard level, represented by the mean fraction of land within the 90m grid cell with flooding at the 100 year, is lowest along the entire road except the kilometres between 25-40 for the entire temporal scope according to all emission scenarios according to classification criteria given below.

**Table 9: Classification criteria for the Flooding Hazard according to Jupiter Intelligence**

| Hazard Level | Threshold |
|---|---|
| Highest | > 3 m |
| High | 2-3 m |
| Medium | 1-2 m |
| Low | 0.25 - 1 m |
| Lowest | < 0.25 m |

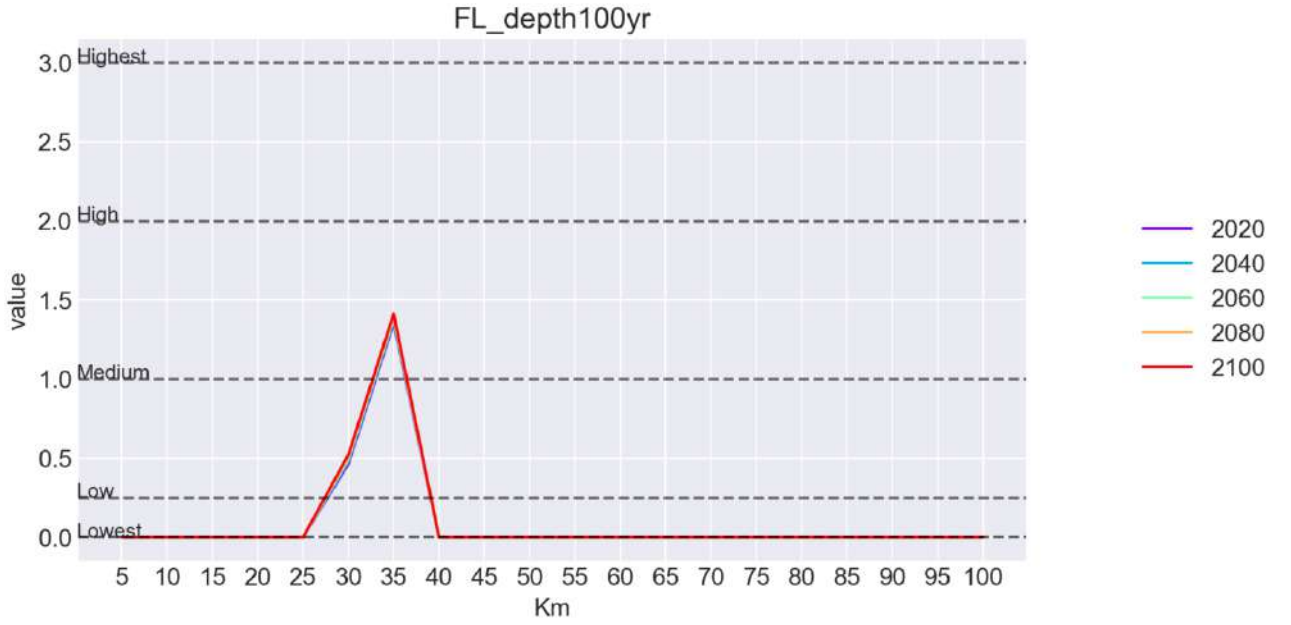



**Figure 27: Flooding hazard, represented by the mean depth of the water (in meters) at the 100-year return period – Optimistic Scenario.**

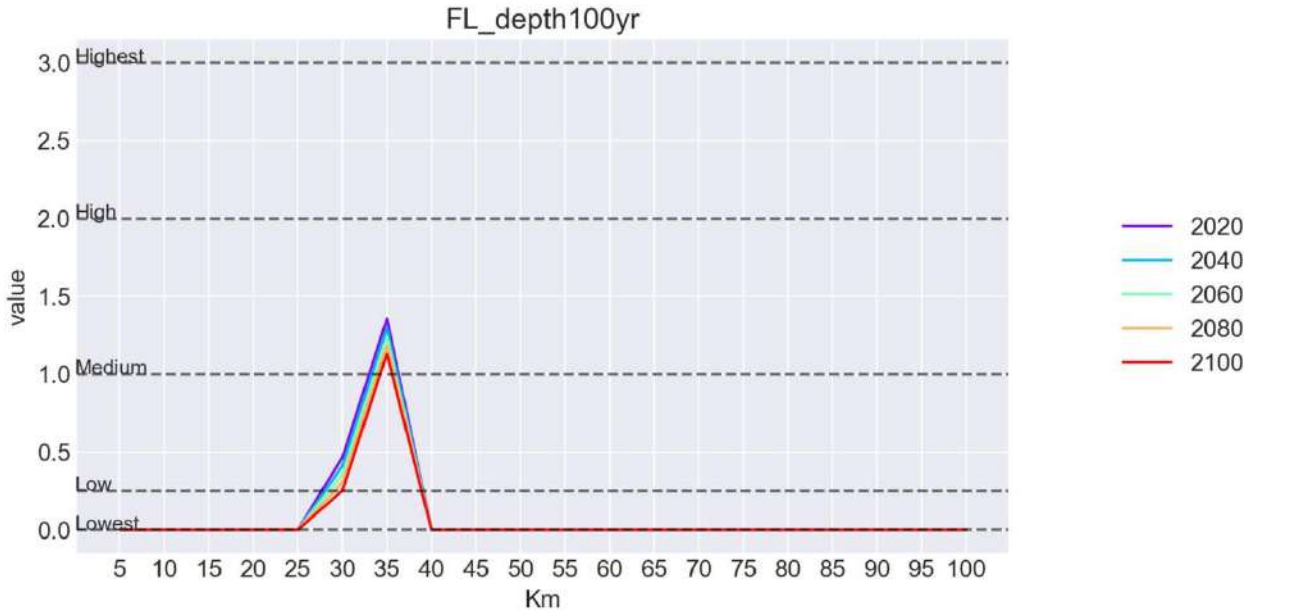



**Figure 28: Flooding hazard, represented by the mean depth of the water (in meters) at the 100-year return period – Intermediate Scenario**

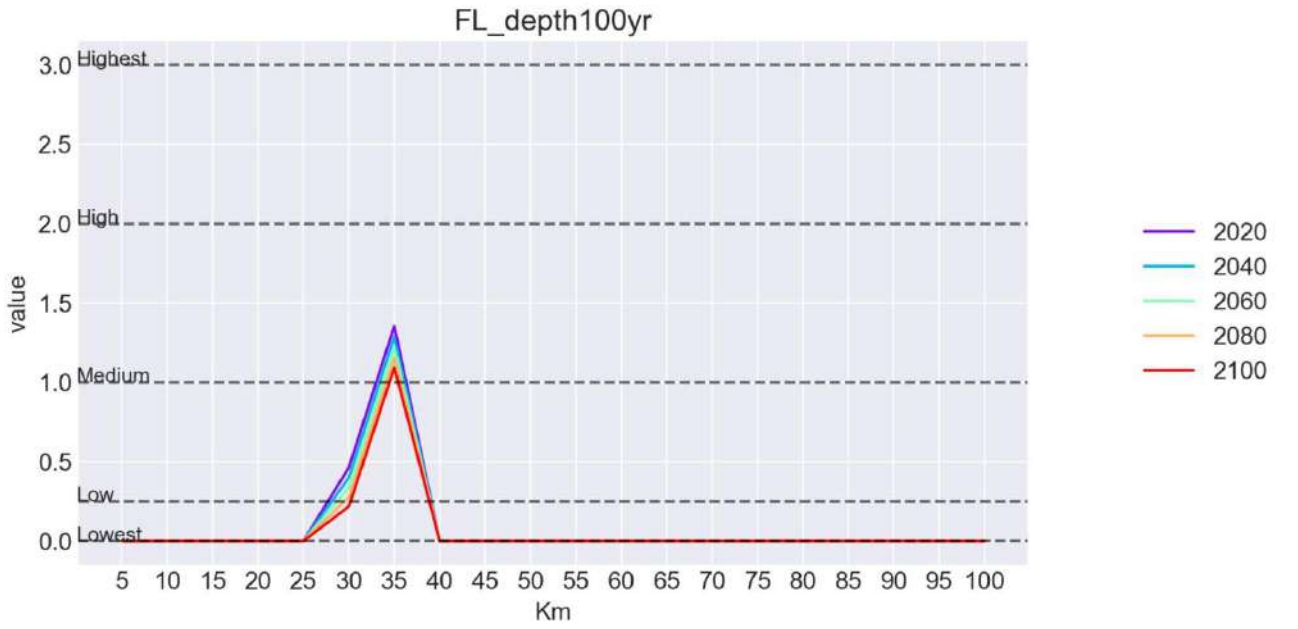



**Figure 29: Flooding hazard, represented by the mean depth of the water (in meters) at the 100-year return period – Pessimistic Scenario**

## 1.3.2 Assessment of Sensitivity, Adaptive-Capacity and Vulnerability

### *1.3.2.1 Sensitivity*

For each hazard, the Sensitivity was qualitatively characterized based on a set of indicators, selected according to the characteristics of the Project potentially exposed to that hazard. A workshop was held in June between the Project representative and a team of WSP Project experts to explain the process and to start identifying a set of most relevant indicators and information useful to support the assessment. Indicators were refined and related information collected with the support of the Project representative.

The final step was to assign a class of Sensitivity (“High”, “Medium” or “Low”), entailing all information collected through the assessment process, also considering their relative importance, reliability and completeness. Classification criteria for sensitivity classes are provided below.

**Table 10: Classification criteria for the Sensitivity classes**

| Sensitivity Class | Description |
|---|---|
| Low | No or minor impacts to the Project main components with no or minor impacts to the Project operativity |
| Medium | Moderate impacts to the Project main components with moderate impacts to the Project operativity |
| High | Significant impacts to the Project main components with significant impacts to the Project operativity |

A conservative approach has been adopted assigning a higher Sensitivity class whenever the assessment was uncertain due to inconsistent indicators.

The Project Sensitivity towards each hazard is presented below with the main considerations that justify the assessment.

**Sensitivity to Extreme Heat:** overall Sensitivity has been assigned “HIGH”. All mentioned impacts are potential damages of significant importance.

Here are the most relevant impacts that extreme heat could cause to all different Project elements:

- Extreme heat can cause asphalt to soften and become tacky at high temperatures, leading to deformation under the pressure of traffic. This can result in cracks and potholes that compromise the road's structural integrity and safety.
- Extreme heat can cause the expansion of concrete and steel used in overpasses and underpasses, leading to misalignment, cracking, or structural damage. Prolonged exposure without proper expansion joints may result in costly repairs, reduced lifespan of the structures, and safety concerns for vehicles.
- Extreme heat can affect the functionality and comfort of motorway service facilities, as high temperatures may strain cooling systems, increase energy consumption, and reduce the overall operational efficiency. Prolonged heat exposure may also cause degradation of building materials, affecting the longevity of the facilities.
- Extreme heat can cause overhead energy transmission lines to expand and sag, leading to potential electrical faults, power outages, and disruptions in energy supply. This could affect the operation of traffic signals and lighting, posing safety risks to both road users and maintenance personnel.
- High temperatures can negatively impact the health of workers on site, for examples potentially causing sunstrokes, intense fatigue and heat stress.

**Sensitivity to Wildfire:** overall Sensitivity has been assigned “MEDIUM”. All mentioned impacts are potential damages of significant importance.

Here are the most relevant impacts that wildfire could cause to all different Project elements:

- Wildfires can cause direct damage to the motorway infrastructure, including the road surface, overpasses, culverts, and noise barriers. High temperatures and flames can degrade or destroy these components.
- Wildfires create immediate safety hazards such as reduced visibility due to smoke, increased risk of falling debris, and potential road blockages caused by damaged infrastructure or fallen trees.
- Wildfires can directly impact motorway service facilities, threatening both buildings and essential services. The risk of fire damage to structures, utilities, and equipment could lead to service closures, prolonged downtime, and increased operational costs for facility operators.
- Wildfires pose a significant risk to overhead energy transmission lines and substations. The heat from wildfires can damage or destroy power infrastructure, leading to electrical outages that disrupt the operation of traffic signals and lighting, posing safety risks to both road users and maintenance personnel.

**Sensitivity to Strong Wind:** overall Sensitivity has been assigned “MEDIUM”. The potential impacts appear to be of medium magnitude, mainly relating to possible disruptions in the operation.

Here are the most relevant impacts that strong winds could cause to all different Project elements:

- Signs, lighting poles, and other roadside structures can be damaged or knocked down by strong winds, potentially leading to road blockages or hazards if these items fall onto the road.
- Strong winds can exert significant forces on overpasses, underpasses, and culverts, causing vibrations or oscillations. Over time, this can lead to structural wear or damage, particularly to elevated roadways,

potentially compromising their stability and integrity. This could necessitate emergency closures, costly repairs, and long-term disruptions to traffic.

- High winds can particularly affect high-sided vehicles like trucks and buses, increasing the risk of these vehicles tipping over. This risk is exacerbated on open stretches of road where there are few barriers to slow the wind.
- Strong winds can place stress on overhead energy transmission lines and substations, causing them to sway, sag, or even collapse. This can lead to power outages, affecting the operation of traffic signals and lighting. Disruptions in power supply could pose safety hazards to road users and require extensive repairs to restore service.
- Strong winds can also impact motorway service facilities, potentially causing damage to buildings, signage, and other infrastructure. This can result in service interruptions, increased maintenance costs, and disruptions to essential facilities, affecting both passengers and operators.
- Strong winds could also lead to a higher presence of dust in the air, thus lowering visibility for the workers and the accumulation of dust on the road.
- Strong winds could also pose a safety risk to personnel that work outdoors or in close proximity to structures that could collapse.

**Sensitivity to Severe Storm:** overall Sensitivity has been assigned “HIGH”. The potential impacts appear to be of significant magnitude, potentially affecting all different project elements.

Here are the most relevant impacts that severe storms could cause to all different Project elements:

- Severe storms can lead to road surface damage from flooding, debris, or high winds. Heavy rain can erode the roadbed, causing misalignment or instability. High winds can blow debris onto the road, creating hazards for drivers. This can result in service disruptions, increased maintenance costs, and heightened risks of accidents, endangering the safety of road users.
- Severe storms can cause significant damage to overpasses, underpasses, and culverts through intense rainfall, flooding, and high winds. Flooding can erode or undermine foundations, while wind can stress or damage structural components. Elevated roadways are particularly vulnerable to storm-induced forces and debris. Damage to these structures may require emergency repairs, causing prolonged road closures and increased operational costs.
- Severe storms can cause significant damage to energy transmission infrastructure along the motorway. High winds, heavy rain, and lightning can lead to power outages, structural damage, and electrical faults. Fallen trees and debris can also damage power lines and substations. Power outages can disrupt road operations, create safety hazards, and require extensive repair efforts to restore service, impacting the functionality of traffic lights and lighting.
- Storms can damage motorway service facilities, with intense rainfall and high winds potentially affecting buildings, utilities, and equipment. Flooding or debris accumulation can disrupt services, increase operational costs, and lead to service interruptions, affecting both passengers and operators.
- Lightning strikes can also damage the road and other Project components.
- Thunderstorms and especially lightning pose a safety risk to personnel that work outdoors or in close proximity to structures that could collapse.

- The drainage system capacity could also be exceeded with a high amount of water or blocked by the dust and other objects moved by the power of the storm.

**Sensitivity to Heavy precipitations (Rain):** overall Sensitivity has been assigned “MEDIUM”.

The potential impacts appear to be of medium magnitude, potentially affecting both the infrastructures and the workforce.

Here are the most relevant impacts that heavy precipitation could cause to all different Project elements:

- Persistent or heavy rainfall can erode the roadbed and embankments, potentially leading to landslides or the collapse of sections of the motorway. This erosion can undermine the structural integrity of the roadway and adjacent structures like culverts.
- Heavy precipitation can overwhelm drainage systems, causing flooding and erosion around overpasses, underpasses, culverts, and interchanges. Prolonged or intense rainfall can lead to structural damage, such as undermining foundations, causing collapse, or damaging the integrity of elevated roadways. In culverts and underpasses, excessive water flow can cause blockages or weaken structures. Structural failures can lead to emergency closures, extensive repairs, and significant disruptions to traffic.
- Heavy precipitation can damage energy transmission infrastructure along the motorway through flooding and waterlogging, which can undermine power poles, switchyards, and foundations. Excessive rain can also lead to electrical faults, increasing the risk of line collapse or damage. Power outages can disrupt road operations, create safety hazards, and require significant repair efforts to restore service, impacting critical systems such as traffic lights and lighting.
- Heavy precipitation can also impact motorway service facilities, potentially damaging buildings, utilities, and essential services. Heavy precipitation can cause disruptions to facilities, increase operational costs, and lead to service interruptions, affecting both passengers and operators.
- Rainwater, especially when it is acidic, can deteriorate road materials, including asphalt and concrete. This leads to quicker degradation
- Heavy rain can damage electronic signs and lighting systems, either through direct water damage or due to power outages associated with storms
- Extreme rain may affect people working on site, thus causing delays in operations. In particular, local flood could represent a relevant electrical or physical risk for workers.

**Sensitivity to Flooding:** overall Sensitivity has been assigned “MEDIUM”.

The potential impacts appear to be of medium magnitude, potentially affecting both the infrastructures and the workforce.

Here are the most relevant impacts that flooding could cause to all different Project elements:

- Flooding could affect workers, with the risk of been drawn by the flood wave, with mud and other sediments transported.
- Flooding can bring a significant amount of debris onto the motorway, including rocks, branches, and other materials that can cause accidents or damage vehicles.
- Overpasses may be particularly vulnerable to flooding, especially if the water levels rise significantly. Flooding can compromise their stability, potentially leading to structural failure.

- Flooding can damage electrical systems for lighting and traffic signals along the motorway, as well as digital signage, affecting their functionality and further compromising road safety.
- The drainage system capacity could also be exceeded with a high amount of water or blocked by other objects dragged by the force of the water into the system. If drainage systems along the motorway are overwhelmed or blocked by debris during a flood, water can accumulate on the road surface, leading to further damage and increased risk of accidents.
- Intense rainfall can quickly overwhelm drainage systems, leading to flooding on the motorway. This can cause temporary closures and force vehicles to take longer detours. Standing water can also hide other hazards, such as deep potholes or debris, which can damage vehicles or cause accidents.
- Flooding can also impact motorway service facilities, potentially damaging buildings, utilities, and essential services. Flooding can cause disruptions to facilities, increase operational costs, and lead to service interruptions, affecting both passengers and operators.

#### 1.3.2.1.1 Adaptive Capacity

Similarly to Sensitivity, the Adaptive Capacity was qualitatively assessed for the entire motorway as a whole through a participatory process that involved the Project representatives and WSP Project experts. The final step was to assign a class of Adaptive Capacity (“High”, “Medium” or “Low”), entailing all information collected through the assessment process, also considering their relative importance, reliability and completeness. Classification criteria for adaptive capacity classes are provided below.

**Table 11: Classification criteria for the Adaptive Capacity classes**

| Adaptive Capacity Class | Description |
|---|---|
| Low | No or little measures in place to either reduce, mitigate, prevent or avoid the potential impacts |
| Medium | Measures in place to moderately reduce, mitigate, prevent or avoid the potential impacts |
| High | Measures in place to significantly reduce, mitigate, prevent or avoid the potential impacts |

A conservative approach has been adopted assigning a lower Adaptive Capacity class whenever the assessment was uncertain due to inconsistent indicators.

Here following are some measures that apply to all different climate-related hazards. These measures will be considered in assigning a class of adaptive capacity of the Project.

- The Project owner is the Republic of Türkiye Ministry of Transport and Infrastructure (MoTI), General Directorate of Highways (KGM) and the Client is the EPC Contractor of the Project. Therefore, the Client will implement the spefications of KGM.
- In order to strengthen the mobile connectivity, which is crucial in case of extreme events, fiber optic network cables along the motorway will be installed in support of the existing GSM network. This infrastructure will support the monitoring of the Project via CCTV and sensors that will be installed along the motorway, operational 24/7. The project will be equipped with Intelligent Transportation Systems, enabling comprehensive oversight and enhanced safety features, such as immediately informing the motorists through Variable Message Signs (VMSs) located along the motorway.

- The Project route will be patrolled by the O&M Subcontractor in 4 hours intervals which will help checking for any potential disruption due to climate-related hazards.
- A quick-response strategy will be implemented for severe weather events, including staffing and equipment readiness.

**Adaptive Capacity to Extreme Heat**

The overall Adaptive Capacity to Extreme Heat has been assessed a “Medium” considering the following adaptive measures:

- Project specific weather monitoring stations are in place in addition to the government's stations. These stations are connected to the Main Control Centre through the SCADA system and can be monitored online.
- Cooling systems for critical infrastructure such as tunnels and service areas will be installed and maintained.
- The roadside vegetation is being regularly watered and will continue to be watered during operation to help cooling the surrounding area and maintain the health of greenery which can provide shade.

**Adaptive Capacity to Wildfires**

The overall Adaptive Capacity to Wildfires has been assessed a “Medium” considering the following adaptive measures:

- There will be a buffer zone named as “fire strip” as per the KGM specifications to reduce the risk of fire spreading to the road.
- Regular clearing and maintenance of vegetation will be conducted along the motorway to reduce the amount of combustible vegetation available for wildfires.
- Infrastructures will be built and maintained using non-combustible or fire-resistant materials, especially for signs, barriers as per the KGM specifications.
- There will be emergency U-turn locations on the motorway to be used in case of emergency situations such as wildfires.
- All service areas, toll plazas and O&M centres will be equipped with automated firefighting systems.

**Adaptive Capacity to Strong Wind**

The overall Adaptive Capacity to Strong Wind has been assessed a “Medium” considering the following adaptive measures:

- Project specific weather monitoring stations are in place in addition to the government's stations. These stations are connected to the Main Control Centre through the SCADA system and can be monitored online.
- All signs, light poles, and other structures will be securely anchored to withstand high winds.
- For high-sided vehicles during strong wind, there will be a system in place to notify local authorities and inform motorists. This will be done through Variable Message Signs (VMSs), advising them not to exceed predetermined speed limits.
- There will be a routine cleaning procedure followed by the patrollers of O&M subcontractor to clean debris potentially brought to the road surface.

**Adaptive Capacity to Severe Storm**

The overall Adaptive Capacity to Severe Storms has been assessed a “High” considering the following adaptive measures:

- All motorway infrastructure such as overpasses, signs and barriers are designed to withstand severe storm conditions.
- Project specific weather monitoring stations are in place in addition to the government's stations. These stations are connected to the Main Control Centre through the SCADA system and can be monitored online.
- There will be a routine cleaning procedure followed by the patrollers of O&M subcontractor to clean debris potentially brought to the road surface.
- Electrical systems will be equipped with surge protectors to prevent damage from lightning strikes. In addition to this, there will be lightning rods with sufficient protection area at service areas, toll plazas and O&M centres.
- There will be emergency U-turn locations on the motorway to be used in case of emergency situations such as severe storms.

**Adaptive Capacity to Heavy precipitations (Rain)**

The overall Adaptive Capacity to Heavy precipitations (Rain) has been assessed a “High” considering the following adaptive measures:

- Project specific weather monitoring stations are in place in addition to the government's stations. These stations are connected to the Main Control Centre through the SCADA system and can be monitored online.
- There will be a routine cleaning procedure followed by the patrollers of O&M subcontractor to clean debris potentially brought to the road surface.
- There will be emergency U-turn locations on the motorway to be used in case of emergency situations such as heavy precipitations.
- Permeable materials will be used for road surfaces to facilitate water drainage.
- High visibility and reflective road markings will be placed that are visible in heavy rain.

**Adaptive Capacity to Flooding**

The overall Adaptive Capacity to Flooding has been assessed a “Low” considering the following adaptive measures:

- There will be a routine cleaning procedure followed by the patrollers of O&M subcontractor to clean debris potentially brought to the road surface.

#### *1.3.2.2 Vulnerability*

The magnitude of potential effects and consequences were assessed for each hazard, combining the Sensitivity and the Adaptive Capacity. A qualitative approach has been used, applying the matrix shown in Figure 30.

| VULNERABILITY | | | |
|---|---|---|---|
| | SENSITIVITY | | |
| ADAPTIVE CAPACITY | Low | Medium | High |
| High | Lowest | Low | Medium |
| Medium | Low | Medium | High |
| Low | Low | High | Highest |

**Figure 30: Vulnerability Matrix**

The Project resulted more vulnerable to Extreme Heat and Flooding. For Extreme Heat this is due to the combination of a “High” Sensitivity, while this is due to the “Medium” Sensitivity and “Low” Adaptive Capacity.

The Project resulted less vulnerable to Wildfires, Strong Wind, Severe Storm and Heavy Precipitations when compared to Extreme Heat and Flooding. In all cases the Vulnerability resulted “Medium”, except for the Heavy Precipitations which resulted as “Low”, as the result of the application of quite an extensive list of adaptation measures which are supposed to reduce the potential impacts of each hazard.

**Table 12: Vulnerability assessment**

| Hazard | Sensitivity | Adaptive Capacity | Vulnerability |
|---|---|---|---|
| EXTREME HEAT | High | Medium | High |
| WILDFIRES | Medium | Medium | Medium |
| STRONG WIND | Medium | Medium | Medium |
| SEVERE STORM | High | High | Medium |
| HEAVY PRECIPITATIONS (RAIN) | Medium | High | Low |
| FLOODING | Medium | Low | High |

### 1.3.3 Risk Assessment

The Climate Change Risk has been assessed combining Vulnerability and Hazard levels, according to qualitative considerations based on the following matrix Figure 31.

| RISK | | | | | |
|---|---|---|---|---|---|
| | VULNERABILITY | | | | |
| HAZARDS | Lowest | Low | Medium | High | Highest |
| Lowest | Lowest | Lowest | Low | Low | Medium |
| Low | Low | Low | Low | Medium | Medium |
| Medium | Low | Medium | Medium | High | High |
| High | Low | Medium | High | High | Highest |
| Highest | Medium | High | High | Highest | Highest |

**Figure 31: Risk Matrix**

A summary of the results follows with the description of how each risk will evolve during the temporal scope according to the different emission scenarios.

- **Extreme Heat Risk:**

Extreme Heat Risk can be considered a significant risk for the Project. In fact, the Project resulted with a high level of vulnerability which combined with hazard levels at the different locations resulted in a range of risk level from medium to high or even highest, in particular considering the intermediate and pessimistic scenarios. Having in mind the evolution in time of this hazard, the risk of extreme heat is expected to become particularly relevant after 2040 and keeping increasing for the rest of the time horizon.

- **Wildfires**

Wildfires can be considered a relevant risk, but it depends on the locations along the road. In fact, having in mind the levels for this hazard according to all 3 different scenarios, there is an increasing chance of having wildfires after around KM:080+000. In particular for the optimistic and intermediate scenarios, there are not significant differences depending on the time frame, while for the pessimistic scenarios the chance of wildfires seems also increasing moving from present to future time period. The combination of these level of hazard with the vulnerability, which was assessed as “medium”, resulted in a risk assessment that can be summarized as follows:

  - KM:000+000 - 080+000: risk level ranging from “low” (for optimistic and intermediate scenarios) to “medium” (for the pessimistic scenario)
  - KM:080+000 – 100+000: ranging from “medium” (for the optimistic and intermediate scenarios) to “high” (for the pessimistic scenarios, in particular considering the second part of the century.

- **Strong Wind**

According to the outcome of the Risk Assessment, strong wind does not seem to be a very significant risk for the Project. In fact, for almost the entire road the hazard levels are low no matter the emission scenarios and temporal scope which combined with a level of vulnerability assessed as “medium” resulted in a “low” level of this risk.

- **Severe Storms**

Severe Storms resulted as a significant risk for the Project. In particular the risk is more critical at the beginning of the road, and it decrease towards the end of it. In fact, at the beginning of the road, the hazard level is “medium” at present reaching the “high” level yet around 2040-2060 (depending on the emission scenario) which combined with a “medium” vulnerability resulted in risk level ranging from “medium” to “high” risks. Instead, at the end of the road, the hazard level is “medium” at present reaching the “high” level yet later on, around 2080 (depending on the emission scenario) which combined with a “medium” vulnerability resulted in risk level “medium” almost for the entire temporal scope of the assessment expect for the very end of the century.

- **Heavy Precipitation**

According to the outcome of the Risk Assessment, heavy precipitation does not seem to be a very significant risk for the Project. In fact, from beginning of the road to the middle, the hazard level is “low” at present reaching the “medium” level yet around 2040-2080 (depending on the emission scenario) which combined with a “low” vulnerability resulted in risk level ranging from “low” to “medium” risks. Instead, from the middle of the road to the end, the hazard level is “low” at present reaching the “medium” level yet later on, around 2080 (depending on the emission scenario) which combined with a “low” vulnerability resulted in risk level “low” almost for the entire temporal scope of the assessment expect for the very end of the century.

- **Flooding**

As per Risk Assessment, flooding does not seem to be a very significant risk for the Project except from the section of the route around KM:025+000 – 040+000 km. In fact, the hazard level is “lowest” until KM:025+000 and after KM:040+000 which combined with a “high” vulnerability resulted in risk level “low” for all three scenarios for the entire temporal scope. Instead, around KM:035+000 the hazard level reaches to “medium” level which combined with a “high” vulnerability resulted in risk level “high” for all three scenarios for the entire temporal scope.

### 1.3.4 Risk Mitigation Actions and Conclusions

The risk assessment that has been performed shows a higher level of risk for extreme heat and severe storms. Flooding resulted a significant risk but only at a very specific location (around KM:035+000). Similarly, wildfires can be considered a critical risk but only at the end of the road (from around KM:080+000 to 100+000). Instead strong wind and heavy precipitations do not seem critical risks for the Project.

WSP suggests a list of potential adaptation measures that applies to all hazards to further prevent the related risks, to reduce the potential impacts towards all different Project elements and to increase the general awareness of climate-related risks. These are listed below:

- Earthworks will be designed to include measures to mitigate shrinkage such as a suitable foundation depth, selection of appropriate material and planting selection/location to ensure stability.
- The motorway and its structures should be regularly monitored for early detection of any potential issues, enabling timely maintenance and interventions to ensure the integrity of the infrastructure.
- After the extreme climate events, the motorway and its structures should be assessed for climate-induced damages, ensuring prompt repairs and minimizing disruptions to traffic flow and safety.
- Spare and emergency capacity should be integrated into safety and operational systems to ensure continuous service in the event of climate-related failures, maintaining the functionality of critical systems such as traffic management and lighting.
- Weather forecasts for extreme weather conditions (such as extreme temperatures, heavy rainfall, etc.) should be closely followed to inform planning and adjust working hours, as well as implement appropriate response strategies during these conditions.
- Expand the existing Emergency Plan to include procedures and measures to deal with climate hazards. The Plan should be regularly updated.
- Ensure appropriate training is provided about Climate Change and related risks to increase workers awareness.
- A collaborative, partnership approach to climate resilience should be adopted, involving stakeholders such as local authorities, environmental agencies, and infrastructure operators to enhance the Project's ability to adapt to climate challenges.
- Consider integrating the outcomes of the risk assessment into Risk Management Plan.

Additionally, appropriate operation-phase adaptive capacity measures will be captured within the operation ESMS and evidence will be provided on how recommended mitigation is being integrated into the Project delivery strategy, in addition to definition of monitoring requirements.

In addition to this, WSP would also like to suggest a list of potential adaptation measures specific to each hazard starting from those which resulted more critical according to this Climate Change Risk Assessment.

For **Extreme Heat** the following measures might be taken under consideration to further avoid, prevent or mitigate the potential impacts:

- Materials will be used in temporary construction facilities that are designed to withstand high temperatures and include appropriate ventilation features.
- Materials will be used in the pavement design that are designed to withstand high temperatures, to minimise the risk of thermal expansion and pavement buckling e.g. bitumen grade and modified binders.
- Design and construct infrastructure with materials that are resistant to high temperatures and thermal expansion.
- Implement programs to prevent heat-related illnesses among road maintenance and construction workers, including scheduling work during cooler hours of the day.
- Operation and maintenance plans will include requirements for regular maintenance of road surface and inspections following extended periods of high temperatures (heat waves).
- Operational Emergency Response Plan will incorporate health and safety measures for employees and road users during extreme high temperatures.

For **Severe Storms**, considering adding the following adaptive measures. Higher priority should be given to sections from beginning to the middle of road.

- Consider putting in place procedures to evaluate the integrity of main infrastructures after severe storms events.
- Consider putting in place procedures to evaluate the integrity of main electrical systems after severe storms events.
- Use the information coming from the existing meteorological station to reschedule the working hours of personnel that work outdoors to avoid been exposed in case of severe storms.
- Integrate the outcomes of the risk assessment into Risk Management Plan in particular for this climate-related hazard considering that the level for this risk is not fully mitigated despite the quite comprehensive existing adaptation measures.

For **Flooding**, considering adding the following adaptive measures, in particular focusing on the section between KM:025+000 - 040+000:

- Flood Risk Assessment will be undertaken to provide detailed analysis of the potential for flooding based on the site's topography, hydrology, and local climate conditions; and to identify areas vulnerable to flooding. Accordingly, the design will take into account the impacts of climate change, including appropriate allowance for climate change to ensure that the risk of flooding is minimised, and there is no increase in flood risk to surrounding areas as a result of the proposed development.
- Temporary or permanent flood barriers will be installed in areas identified to be at risk of flooding.
- Install sensors to detect rising water levels and provide early warnings to road users and maintenance teams.
- Flooding sensors and alerts will be installed or provided to alert workers and road users.

For **Wildfires**, considering adding the following adaptive measures.

- Consider building firebreaks along the motorway, especially in sections between KM:080+000 – 100+000 which resulted more prone to wildfires. These can act as barriers to slow or stop the spread of fire.
- Work closely with local fire departments and forest service agencies to develop coordinated response plans for wildfire emergencies. This includes joint training exercises and shared communication systems.

For **Strong Wind** considering adding the following adaptive measures.

- A more in-dept analysis of wind conditions during operation might be conducted to identify sections exposed to strong wind where eventually install windbreaks or barriers along exposed sections of the motorway to reduce wind velocity.

Finally for **Heavy Precipitations**, there are no additional measures to be recommended.

# Signature Page

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**REPORT**

# KINALI MALKARA MOTORWAY PROJECT

*Appendix I- Cultural Heritage Impact Assessment Maps and Cultural Heritage Management Plan (including Chance Find Procedure)*

Submitted to:

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**APPENDIX I**

# Cultural Heritage Impact Assessment Maps and Cultural Heritage Management Plan (including Chance Find Procedure)



# KINALI-MALKARA MOTORWAY PROJECT
# KINALI-MALKARA SECTION
# CULTURAL HERITAGE MANAGMENT PLAN

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## ABBREVIATIONS

| | |
|---|---|
| AD | Anno Domini |
| Archeo-Team | Archaeological Field Survey Team / Expert |
| Asst. Prof. | Assistant Professor |
| BC | Before Christ |
| CF | Chance Find |
| CHA | Cultural Heritage Area |
| CHMP | Cultural Heritage Management Plan |
| ICOMOS | International Council on Monuments and Sites |
| ICCROM | The International Centre for the Study of the Preservation and Restoration of Cultural Property |
| GIS | Geographical Information System |
| KM | Kilometer |
| KML | Keyhole Markup Language |
| KMZ | Keyhole Markup Language Zipped |
| IFC | International Finance Corporation |
| EBRD | European Bank for Reconstruction and Development |
| M | Meter |
| No | Number |
| Shp (shape) | Netcad data name |
| Project Owner | KGM - General Directorate of Highways |
| RoW | Right of way |
| UK | United Kingdom |
| UNESCO | The United Nations Educational, Scientific and Cultural Organization |
| WB | World Bank |
| WGS | World Geodetic System |

## 1.0 PURPOSE AND SCOPE

The purpose of this Cultural Heritage Management Plan ("CHMP") is to preserve the archaeological and cultural heritage within the scope of the Project and minimize the possible adverse impacts.

The impact mitigation considering the existing and potential archaeological sites within the Project Area is possible by developing a management plan. Based on that, the construction activities should be conducted under the scope of this CHMP in accordance with the national legislation and in international standards. Within the document, a management plan is defined in general terms for the archaeological heritage within the Project area.

.




**Figure 1** Known Archaeological Excavation Sites Around the Project Route

## 2.0 LEGISLATION FRAMEWORK

In this section, the legislation framework that is related to the management of cultural heritage is summarized.

### 2.1 Law on Protection of Cultural and Natural Assets (Law No: 2863 (published in the Official Gazette dated July 21, 1983))

In Türkiye, the movable and immovable cultural and natural assets are under protection and conservation with the "Law on Preservation of Cultural and Natural Assets", 2863 that was amended by law numbered 3386 (Date of Acceptance: 21.07.1983, published in the Official Newspaper issue 18113 with date 23.07.1983).[1] According to the Law, essential assets which are identified as cultural and natural heritage under legal protection are identified as follows:

- Natural and immovable cultural assets belonging to the 19th century and before;
- Any immovable cultural asset constructed after the end of the 19th Century but categorized as "a significant asset which requires preservation" by the Ministry of Culture and Tourism;
- Immovable cultural assets located within the Protection Sites (in the Law, Protection Sites are defined as ancient sites and city ruins that reflect the main social, economic or architectural characteristics of their era. Protection Sites may also be locations where fundamental historical events took place or areas containing considerable natural or cultural assets with natural or cultural features requiring preservation);
- Structures, buildings or places that have witnessed significant historical events during the Turkish Independence War or the foundation of the Turkish Republic, regardless of time and registration; and
- All dwellings and buildings that have been used by Mustafa Kemal ATATÜRK without considering their time of construction or registration.

Within the scope of this Law, the Ministry of Culture and Tourism and its local branches (Boards for Preservation of Cultural and Natural Assets, Museums) are responsible to take decisions at a national level and providing necessary legal actions to protect cultural and natural assets listed above. At the local level, Regional Boards for Preservation of Cultural and Natural Assets are responsible to register and classify the cultural and natural heritage, inspecting and taking decisions regarding land use and construction works related to motorway projects which can affect these assets. Declaration of site protection, covering discovered cultural heritage located in their area of authorization, is also under the responsibility of the Regional Boards whose decisions can directly affect the Project too.

According to Law on Preservation of Cultural and Natural Assets numbered 2863, all natural and cultural assets meeting conditions for legal preservation are the property of the State. Therefore, Regional Boards have the power and the authority to ensure legal protection and conservation of relevant sites and to approve or reject all activities which have the potential for negative impact on

[1] https://www.mevzuat.gov.tr/MevzuatMetin/1.5.2863.doc

these sites such as construction, destruction, road cut and excavation. Currently, the İstanbul 1 and Edirne Regional Board for Preservation of Cultural and Natural Assets are the board responsible for the Project Area.

Apart from the Law on Preservation of Cultural and Natural Assets numbered 2863, some additional regulations do exist governing the procedures about the protection and preservation of cultural and natural assets. First of these is the Principle Decision of the Ministry of Culture and Tourism of Türkiye named "Protection and Use Conditions of Archaeological Sites" (No. 658, issued 5 November 1999).[2] This decision states that all archaeological sites need to be classified and protected according to their significant features.

In the law archaeological sites are classified under three categories. These are:

- 1st Degree Archaeological Sites,
- 2nd Degree Archaeological Sites,
- 3rd Degree Archaeological Sites

Principle Decision No: 658 defines these sites as follows:

- **1st Degree Archaeological Sites:** Areas requiring highest level of protection. They should be preserved with the exception of scientific excavations. The area should be free of any type of buildings and construction. All kinds of construction, excavation, and modification activities are prohibited. However, for exceptional cases such as the necessity for infrastructure construction, Regional Preservation Boards may permit such activities based on the approval of the relevant museum and the head of the scientific excavation team.
- **2nd Degree Archaeological Sites:** Areas requiring ***high*** level of protection. They should be preserved based on the conditions of protection and utilization set by the Regional Preservation Boards. Additional construction is prohibited. As for the 1st Degree Site Degree archaeological sites, for exceptional cases such as the necessity for infrastructure construction, Regional Preservation Boards may permit such activities based on the approval of the relevant museum and the head of the scientific excavation team.
- **3rd Degree Archaeological Sites:** Lowest level of protection area. Construction is permitted based on the decisions of Regional Preservation Boards. Before applying for a construction permit, test pit excavations should be conducted and the outcomes of these excavations should be reviewed by the relevant museum and, if present, the head of the scientific excavation team. ***All excavations are under the supervision of museum expert.*** Reviews should be submitted to Regional Preservation Boards. The Boards may ask for extension of the areal test pit coverage before taking any decision.

[2] https://kvmgm.ktb.gov.tr/TR-44310/ilke-karari--karar-no-658--karar-tarihi-05111999.html

The archaeological and cultural heritage findings were listed in the Archaeology Baseline Report and is also given Appendix.

### 2.1.1 Definitions *(Article 3 of the Law numbered 2863)*

**Article 3 of the Protection of Cultural and Natural Entities Law provides the following definitions:**

- *Cultural Assets are all over-ground, underground or submarine movable and fixed assets related with science, culture, religion and fine arts, belonging to prehistoric and historic eras.*
- *Natural Assets are the over-ground, underground or submarine assets that belong to geological eras, prehistoric and historic eras and that shall be protected because of their rarity or specifications and preciousness.*

### 2.1.2 Obligation to Inform (Article 4 of the Law numbered 2863)

In case of chance find of movable or immovable cultural assets, the nearest museum directorate or mukhtar in the villages, local authorities in other places should be informed. If these cultural assets are encountered within military posts and forbidden areas, major commands should be duly informed. Mukhtar should inform the nearest ***local*** authority within a day (24 hours), the ***local*** authority and other authorities should report the incident to the Ministry of Culture and Tourism and the related museum directorate via formal letter. The Ministry of Culture and Tourism, General Directorate of Cultural ***Heritage and Museums*** and related ***Regional Board Directorate of Protection of Cultural Heritage*** are responsible for the registration of the cultural heritage

### 2.1.3 Legal Necessities before the Impact Mitigation Measures (Article 7 of the Law numbered 2863)

In Article 7, it is stated that the related ***Regional Board Directorate of Protection of Cultural Heritage*** are responsible for the registration of the cultural and natural heritage. Therefore, for the registration of the immovable cultural assets, it is required to apply officially and directly to the related ***Regional Board Directorate of Protection of Cultural Heritage***.

## 2.2 Regulation on Determination and Registration of Immovable Cultural and Natural Heritage (Official Gazette dated 10.12.1987 and numbered 19660)

The aim of this regulation is to introduce principles on permits about research and excavations to be conducted under the law of protection of cultural and natural entities, the preservation necessities of the findings, studies on these findings, the assignments, duties and authorizations, rights and expenses of the related persons.

## 2.3 European Convention on The Protection of The Archaeological Heritage (Revised) (Valetta, 16/01-1992)

This convention is known as the Valetta Convention. It sets guidelines for the funding of excavation and research work and publication of research findings. It also deals with public access, in particular

to archaeological sites, and educational actions to be undertaken to develop public awareness of the value of the archaeological heritage.

### 2.4 Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972

Türkiye is a signatory to this Convention (The World Heritage Convention), which was approved by The General Conference of the United Nations Educational, Scientific and Cultural Organization (UNESCO), meeting in Paris from 17 October to 21 November 1972.

The signatories to this Convention have agreed "to ensure that effective and active measures are taken for the protection, conservation and presentation of the cultural and natural heritage" on their territories.

## 3.0 ROLES AND RESPONSIBILITIES

Project Owner will be responsible for the preparation and implementation of the environmental and social impact assessment-based management plans, which will be project specific. These plans shall be practical, detailed procedures for use in the field.

Project Owner will ensure the implementation of the commitments stated in the ESIA.

Project Owner will also be responsible for the performance of all contractors and subcontractors with respect to the project specific plans and shall comply with all relevant project standards, statutory requirements, permit and license conditions and secure all applicable permits and licenses.

### 3.1 Management of Cultural Heritage

The basic definitions regarding the management of cultural heritage are given in the following bullets:

- Ministry of Culture and Tourism is the responsible authority.
- Museum Directorate is responsible to provide experts for the sites within 24 hours after being informed and to officially define the Chance Find (see Appendix-2). ***Museum directorate is responsible excavation of chance find areas. Museum Directorate will follow the directions and decisions from Regional Board Directorate of Protection of Cultural Heritage***.
- ***Regional Board Directorate of Protection of Cultural Heritage*** is the only decision maker on any intervention, which would be made on the site after the chance find.
- Project Owner is responsible for the management of archaeological issues during the progress of construction of the Project area and implementation of related management plan and chance find procedure.
- Project Owner will employ archaeologists at the Project site responsible for the monitoring of ground disturbance activities. They are also responsible with the monitoring of the implementation of the CHMP and chance find procedure.
- Project Owner will ensure that Chance Finds procedure is adequately enforced during ground disturbance activities. During the implementation of the Chance Finds procedure on site, Project Owner will directly report the issue to Museum archaeologist and relevant Regional Preservation Board.
- Salvage excavation (and other Chance find issues) (If necessary) are under the responsibility of Project Owner.
- Project Owner is also responsible for giving necessary trainings to the field staff about the implementation of the chance find procedure.
- Project Owner will record all chance finds on the Chance Finds Report Form and in the Chance Finds Register as per the Chance Find Procedure in Appendix-2.

## 3.2 Management Structure and Responsibilities

Project Owner will be responsible for the execution of the plan and procedure about archaeological issues of Project site. The Archaeologist of Project Owner will train the employees about cultural heritage and chance find procedure (see Section 5.1). Also, the monitoring of the construction works will be the responsibility of Project Owner Archaeologist (see Section 5.3).

The Project Manager will be in charge of the all-construction work team.

The Archaeologists will work with the equipment operators and have authority to the stop work. Each will accompany topsoil stripping crew during RoW clearing. They will direct the operator to stop work or redirect stripping activities in case of a chance find. They will submit scheduled progress reports and special reports of chance finds to Environmental and Social Coordinators.

In addition to the Chance Find Procedure, the Edirne and İstanbul 1 No Regional Board Directorates will decide for the requirement of a salvage excavation if needed. The contact information of these board directorate is given in Appendix-3. The excavation permissions will be obtained by the relevant museum directorate from the General Directorate of Cultural Heritage and Museums. Following the permission, Project Owner will provide a team of qualified archaeologist to conduct the salvage excavation within the framework of their contract under the guidance of Project Archaeologist / Consultant archaeologist, who will follow the instructions of the related museum directorate. These works may cover non-destructive research methods such as remote sensing and geophysics and test pit excavations. The negotiations and meetings with the related Regional Board Directorate of Protection of Cultural Heritage on technical topics during and after the salvage excavation will be held by Project Archaeologist / Consultant archaeologist.

**During the construction activities, there will be no blasting within 300 m of archaeological sites (see "Implementing Regulation of Mining Activities, Item 24")[3].**

[3] https://www.resmigazete.gov.tr/eskiler/2010/11/20101106-6.htm

## 4.0 ARCHAEOLOGICAL FINDINGS

The procedure given below that must be followed in case of encountering a chance find is based on national legislation and provisions in international standards. The significance of the archaeological finding may vary upon evaluation opinions of related museum experts.

### 4.1 Intangible Cultural Heritage

Project Owner will liaise with local authorities to identify if project activities can interfere with traditional celebrations or festivities; alternative solutions will be agreed with local authorities. Furthermore, Project Owner will liaise with local authorities to identify if project activities restrict access to elements of traditional culture; alternative solutions will be agreed with local authorities

### 4.2 Archaeological Findings of Minor Significance

This type of archaeological findings is comprised of a finding isolated from its environment or findings in notably small sizes which may be found by chance. In this case, chance find procedure (CHMP, Appendix-2) will be followed.

The finding will be reported to the archaeologist. The construction activities will be ceased in the field where the finding is discovered and the finding will be reported to the relevant museum expert by archaeologist. Following the completion of investigation of the notified relevant Museum Directorate, the necessary arrangements, such as the identification of the boundaries of the archaeological asset/site (finding), preservation by a protection band, notification of workers in order to prevent any physical intervention.

The archeological and cultural heritage findings and preservation methods and mitigation measures for each finding for the Project Area are listed in Appendix-1.

### 4.3 Archaeological Findings of Moderate Significance

This type of archaeological findings is small scale findings in groups or single findings with medium size architectural elements such as tombs. In this case, chance find procedure (CHMP, Appendix-2) will be followed. In order to prevent a possible damage, necessary arrangements must be made to determine the boundaries of the archaeological remains to keep the construction equipment out of access.

The finding will be reported to the construction manager and archaeologist by the Project Owner. The construction activities will be ceased in the field where the finding is discovered and the finding will be reported to the relevant museum expert by archaeologist. Following the completion of investigation of the notified relevant Museum Directorate, the necessary arrangements will be taken, such as the identification of the boundaries of the archaeological asset/site (finding), preservation by a protection band, notification of workers in order to prevent any physical intervention.

### 4.4 Archaeological Findings of Major Significance

This type of findings is comprised of findings with great importance such as a settlement area, a tumulus, a mound or a big necropolis (wide graveyard areas with archaeological characteristic) and

the construction activities must be immediately stopped and chance find procedure (CHMP, Appendix-2) will be followed. This type of chance find may cover the entire construction site in such a way that the entrance and exit of the construction equipment and vehicles cannot be managed without giving any damage to the archaeological remains.

The finding will be reported to the construction manager and archaeologist by the archaeologist of Project Owner. The construction activities will be ceased in the field where the finding is discovered and the finding will be reported to the relevant museum expert by archaeologist. Following the completion of investigation of the notified relevant Museum Directorate, the necessary arrangements will be taken, such as the identification of the boundaries of the archaeological asset/site (finding), preservation by a protection band, notification of workers in order to prevent any physical intervention.

## 5.0 TRAINING, REPORTING AND MONITORING

### 5.1 Training

The Archaeological Monitoring archaeologist/consultant of Project Owner will provide cultural heritage training to all project crew including the implementation of the chance find procedure as part of the Project trainings. Archaeologists of Project Owner will receive archaeological training as well as specialized training for the procedures they are to follow for monitoring site construction activities.

### 5.2 Reporting

Project Owner will record all chance finds on the Chance Finds Report Form (see CHMP, Appendix-2) and in the Chance Finds Register (see Appendix-3) as per the Chance Find Procedure in Appendix-2. The register will be kept up to date by ***Project Owner*** archaeologist. ***The chance finds report form will be kept in hard copy by the archaeologist.***

### 5.3 Monitoring

The function of the archaeological monitoring process will be as follows:

- Provide advice to define the areas where the construction activities may continue or shall be stopped due to Archaeological findings.
- To record archaeological features observed on, and close to the existing project site.
- To record archaeological features discovered during construction activities.
- To provide advice in the form of a 'preliminary assessment' to the construction superintendent on the significance and implications of new archaeological discoveries on the project site.

***All ground disturbance activities will be monitored by Project Owner's archaeologist*** during the construction of the project site and its Above Ground Facilities ***for evidence of cultural heritage items.*** In case of encountering archaeological findings, the Chance Find Procedure described in Appendix-2 will be initiated.

## 6.0 REFERENCES


- Council of Europe ETS No 143, “European Convention on the Protection of the Archaeological Heritage (Revised) (The Valletta Convention)”, 1992.
- General Directorate of Preservation of Cultural and Historical Heritage, “Law on Protection of Cultural and Natural Assets (1) Law No. 2863”, 1983.
- ICOMOS (International Council of Monuments and Sites) “Guidance on Impact Assessment for Cultural World Heritage”, January 2011.
- IFA (Institute of Field Archaeologists) Standard and Guidance for the Collection, “Documentation, Conservation and Research of Archaeological Materials”, 2001.
- IFA (Institute of Field Archaeologists) 1994, “Standard and Guidance for an Archaeological Desk Based Assessment” (revised 1999)
- IFA (Institute of Field Archaeologists) 1994, “Standard and Guidance for an Archaeological Watching Brief” (revised 1999)
- IFA (Institute of Field Archaeologists) 1994, “Standard and Guidance for an Archaeological Field Evaluation” (revised 1999)
- UNESCO, “Convention Concerning the Protection of the World Cultural and Natural Heritage”, November 1972

**APPENDIX 1-** Archaeological and Cultural Heritage Findings and Mitigation Measures

*Table 1: Impact Analysis Table (1st Survey)*

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| **1** | **HRM-1** | 5+500 | Altun Tepe Tumuli | Roman | 328 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring.<br><br>The notifications of the museum directorate should be followed. |
| **2** | **HRM-2** | 4+00 | Settlement | Roman and Byzantium | 515+500 | **5** | **ABOVE 150 M.**<br><br>**NO EFFECT** | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **3** | **HRM-3** | 0+500 | Bridge | Early Republic | Start Point of Access Road | | | No | **Medium** | No Change | Neutral | Neutral | Using the structure for the trespassing of especially heavy tonnage vehicles within the scope of construction activities should be strictly avoided. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area |

| No | Findings Code | Project KP | Name / Type | Period | Distance Between Route | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **4** | **HRM-4** | NA | Bridge | Early Republic | 2500 m | | | No | **Medium** | No Change | Neutral | Neutral | Using the structure for the trespassing of especially heavy tonnage vehicles within the scope of construction activities should be strictly avoided. The general architectural layout has various deformations. If its use by the Project vehicles is unavoidable, then speed limitation warnings and preventions must be utilized. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **5** | **HRM-8** | 17+500 | Settlement | Late Roman/Byzantium | 320 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **6** | **HRM-9** | Marmara Ereğlisi Access Road | Tumuli | Roman Era | 650 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **7** | **HRM-10** | 18+500 | Bridge | Ottoman Era | 2600 m | | | Yes | **Medium** | No Change | Neutral | Neutral | Extra care should be taken in the selection of alternative routes that can lead to the Project Site and heavy tonnage loads should not be passed over this specific bridge. Said so, it is recommended that this bridge should be recorded on constraint maps, its possible use must be avoided, and if any transitions are inevitable, they must be realized under the supervision of archaeologists when necessary. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **8** | **HRM-13** | 33+800 | Flat settlement | Late Ottoman Era | 380 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **9** | **HRM-14** | 40+050 | Flat settlement | Late Ottoman Era | 450 m | | | No | **Low** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **10** | **HRM-15** | 41+500 | Potential Tumuli | Roman Era | 330 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **11** | **HRM-16** | 47+00 | Settlement and Necropolis | Roman Era | 160 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring.<br><br>The notifications of the museum directorate should be followed. |
| **12** | **HRM-17** | 50+00 | Flat settlement | Late Ottoman Era | 750 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **13** | **HRM-20** | 60+00 | Flat settlement and Tomb | Late Ottoman Era | 560 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **14** | **HRM-22** | 60+300 | Necropolis | Byzantium | 205 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **15** | **HRM-25** | 61+800 | Aqueduct | Roman Era | 235 m | | | Yes | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **16** | **HRM-26** | 63+100 | Necropolis | Byzantium | 200 m | | | No | **High** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **17** | **HRM-29** | 73+400 | Rural settlement | Roman | 230 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **18** | **HRM-31** | 78+300 | Cemetery | Modern | 355 m | | | No | **Low** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>Although the archaeological site is not close to the route, this cemetery is considered within the scope of intangible and tangible cultural heritage. Passing of construction machinery from this section must be strictly avoided especially during the construction phase and people that will come to visit the cemetery should not be disturbed. |
| **19** | **HRM-32** | 81+00 | Cemetery | Ottoman and Modern | 308 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>Although the archaeological site is not close to the route, this cemetery is considered within the scope of intangible and tangible cultural heritage. Passing of construction machinery from this section must be strictly avoided especially during the construction phase and people that will come to visit the cemetery should not be disturbed. |
| **20** | **HRM-33** | 90+700 | Flat settlement | Byzantium | 335 m | | | No | **High** | Negligible Change | Neutral/Slight | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **21** | **HRM-34** | 91+100 | Flat settlement | Byzantium | 205 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **22** | **HRM-27** | 63+300 | Settlement and Necropolis | Ottoman | 148 m | **4** | **100-150 M LOW** | No | **Medium** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **23** | **HRM-36** | 97+600 | Flat settlement | Byzantium | 105 m | | | No | **High** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| **24** | **HRM-5** | 7+501 | Mound | Roman | 53 m | | | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **25** | **HRM-6** | 9+800 | Settlement | Byzantium-Ottoman | 63 m | **3** | **50-100 m Medium** | No | **High** | No Change | Neutral | Neutral | The Project Route passes through the southern part of the identified area. There is no direct contact with the Project Route. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **26** | **HRM-11** | 22+300 | Flat settlement | Late Ottoman Era | 80 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| **27** | **HRM-12** | 34+500 | Flat settlement | Late Ottoman Era | 84 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **28** | **HRM-24** | Around Km 61<br>Access Road | Potential Tumuli | Roman Era | 75 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **29** | **HRM-28** | 67+200-<br>Access Road | Flat settlement | Late Ottoman Era | 52 m | | | No | **Medium** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| **30** | **HRM-35** | 91+800 | Settlement and Necropolis | Late Roman/Byzantium | 65 m | | | No | **High** | Moderate Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **31** | **HRM-37** | 100+200 | Necropolis | Roman Era | 97 m | | | No | **High** | No Change | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **32** | **HRM-23** | Access Road | Flat settlement | Late Ottoman Era | **5** | **2** | **0-50 m Risky** | **No** | **Medium** | Moderate Change | Moderate | Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| **33** | **HRM-30** | 74+100 | Flat settlement | Late Ottoman Era | 10 m | | | No | **Medium** | Minor Change | Slight | Neutral/Slight | Due to its proximity to the archaeological site Museum-controlled pre-works within the area are advised. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **34** | **HRM-40** | 105+00 | Potential Necropolis | Late Roman/Byzantium | 35 m | | | No | **High** | Negligible Change | Neutral/Slight | Neutral | Due to the proximity of the area to the Project construction site, it is recommended to conduct a museum-controlled preliminary study to clearly understand the spread of the site. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| **35** | **HRM-7** | 11+700 | Mound | Chalcolithic, Roman, Byzantium | **On The Route** | **1** | **On The Route Axis**<br>**High Risk** | **No** | **High** | Moderate Change | Moderate / Large | Moderate / Slight | The Project Route passes over the determined area. Thus, a re-evaluation of the route in this specific area is recommended. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | Museum. The construction works around the area require archaeological on-site monitoring. |
| **36** | **HRM-18** | Tekirdağ Süleymanpaşa Access Road | Tumuli | Roman Era | **On The Route** | | | **No** | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **37** | **HRM-19** | Tekirdağ Süleymanpaşa Access Road | Tumuli | Roman Era | **On The Route** | | | **No** | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **38** | **HRM-21** | Around KM 60 Access Road | Flat settlement | Late Ottoman Era | **On The Route** | | | **No** | **Medium** | Negligible Change | Neutral/Slight | Neutral | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant |

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| | | | | | | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **39** | **HRM-38** | 102+00 | Flat settlement | Late Roman/Byzantium | **On The Route** | | | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed. Since the area coincides directly with the Project axis, it is recommended to carry out a museum-controlled preliminary study. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |
| **40** | **HRM-39** | 104+200 | Potential Necropolis | Hellenistic Era-Roman | **On The Route** | | | No | **High** | Moderate Change | Moderate / Large | Moderate / Slight | First of all, the route change should be evaluated. If changes cannot be made, the notifications of the museum directorate should be followed. Since the area is directly on the Project axis, it is recommended to carry out a museum-controlled preliminary study. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. |

*Table 2: Impact Analysis Table (2nd Survey)*

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | |
| 1 | CHA1 | Çakılköy | Cemetery | Modern | 27,300 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 2 | CHA2 | Çakılköy | Settlement | Late Ottoman | 27,200 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | Since it is very close to the Project facilities, it is recommended to conduct a preliminary study under the supervision of the Museum.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 3 | CHA3 | Çakılköy | Potential Arc. Site | Late Roman | 27,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Medium | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 4 | CHA4 | Danamandıra | Cemetery | Early Rep./Modern | 2,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The |

| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Code Categorization (Interaction of the area with the Project) Ranking | Code Categorization (Interaction of the area with the Project) Explanation | Registration Status | Impact Analysis as per ICOMOS Guidance: Value of Heritage Asset | Impact Analysis as per ICOMOS Guidance: Scale of Impact | Impact Analysis as per ICOMOS Guidance: Significance of Impact before Mitigation Measure | Impact Analysis as per ICOMOS Guidance: Significance of Residual Impact (After Mitigation Measures | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 5 | CHA5 | Küçüksinekli | Sinekli Train Station | Late Ottoman | On The Access Road | 1 | On The Access Road<br><br>High Risk | Registered | High | Minor Change | Moderate / Large | Slight | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>Since this route is planned to be used during transportation, the slow passing of the heavy tonnage vehicles from this point is recommended. This is especially recommended within the limits of the settlement as the vibration effect that might be created by the heavy load of the trucks can damage the structures. |
| 6 | CHA6 | Beyciler | Cemetery | Early Rep./Modern | 15 m | 2 | 0-50 m<br><br>Risky | Unregistered | Low | Unknown | Neutral/Slight | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 7 | CHA7 | Çeltik | Mound | Hellenistic-Roman | 800 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a site because the settlement area in question should also have a necropolis. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | |
| | | | | | | | | | | | | | Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 8 | CHA8 | Çeltik | Tumuli | Roman | 1,200 | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located on the edge of the area called Storage Area – 1 (Çeltik) and at the entrance of the village. These areas should be taken into account in site selection for construction works. Moreover, despite the uncertainty on the state of registration of the aforementioned area the Directorate of the İstanbul Archaeology Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 9 | CHA9 | Yolçatı | Cemetery | Early Rep. / Modern | 480 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 10 | CHA10 | Yolçatı | Settlement | Late Roman | 590 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | The site lies towards the north of Yolçatı Village and stands near the river. It is also located in Storage Area – 1 (Çeltik) area. Particular attention should be paid to this area when choosing a site because the settlement area in question should also have a necropolis.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| | | | | | | | | | | | | | proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 11 | CHA11 | Çanta | Tumuli | Roman | 2,550 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located almost in the middle of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits on it. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 12 | CHA12 | Çanta | Cemetery | Early Rep. / Modern | 3,050 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 13 | CHA13 | Çanta | Mosque | Late Ottoman | 3,200 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| 14 | CHA14 | Çanta | Church | Late Ottoman | 3,300 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | Medium | Unknown | Neutral | Neutral | It is located to the west of the field named Storage Area-2 (Çanta) and towards the east of the old village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 15 | CHA15 | Çanta | Remains of Old Village | Late Ottoman | 3,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | High | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 16 | CHA16 | Çanta | Cemetery | Late Ottoman | 2,800 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | It is located to the west of the field named Storage Area-2 (Çanta) and towards the east of the old village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| 17 | CHA17 | Çanta | Tumuli | Roman | 750 m | 5 | ABOVE 150 M.<br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits still visible on the tumulus. The tumulus, which is quite high, is among the highest in the region. It is recommended not to work in areas close to the registered tumulus, but if planning has to be done in these areas, the directorate of the İstanbul Archaeological Museums should be informed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 18 | CHA18 | Çanta | Tumuli | Roman | 650 m | 5 | ABOVE 150 M.<br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits still visible on the tumulus. It is recommended not to work in areas close to the registered tumulus, but if planning has to be done in these areas, the directorate of the İstanbul Archaeological Museums should be informed.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 19 | CHA19 | Çanta | Tumuli | Roman | 1,050 m | 5 | ABOVE 150 M.<br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. There are illicit digging pits still visible on the tumulus. It is recommended not to work in areas close to the registered tumulus, but if planning has to be done in these areas, the directorate of the İstanbul Archaeological Museums should be informed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| | | | | | | | | | | | | | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 20 | CHA20 | Çanta | Cemetery | Late Ottoman | 1,700 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | It is located towards the south of the area named Storage Area-2 (Çanta). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 21 | CHA21 | Değirmenköy | Tumuli | Roman | 830 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is a potential tumulus. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| 22 | CHA22 | Seymen | Settlement | Late Ottoman | 575 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 23 | CHA23 | Türkgücü | Cemetery | Early Rep./ Modern | 950 m | 5 | ABOVE 150 M.<br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It will likely be affected by any of the construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 24 | CHA24 | Türkgücü | Tumuli | Roman | 1,250 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a site because the settlement area in question should also have a necropolis. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 25 | CHA25 | Türkgücü | Settlement | Late Romann | 1,500 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located within the borders of the area named Borrow Pit-2 (Türkgücü). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
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| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| | | | | | | | | | | | | | either as a 1st or 3rd Degree Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 26 | CHA26 | Türkgücü | Tumuli | Roman | 680 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | | | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 27 | CHA27 | Yenice | Settlement | Hellenistical-Roman | 340 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Since 2 different archaeological sites were identified in the route studies, care should be taken around this area.<br>In this aspect, Museum-controlled trial excavations which will be realized during the pre-construction period are strongly recommended to evaluate the potential risks and for making plans for damage prevention.<br>As the site lies directly on the Borrow Pit-3 (Yenice) area, the Project operators should act in accordance with the decisions that will be taken by the Museum Directorate or Edirne Regional Board for Preservation of Cultural and Natural Assets.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 28 | CHA28 | Karatepe | Settlement | Late Romann | 3,500 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a location.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| | | | | | | | | | | | | | an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 29 | CHA29 | Karatepe | Nekropol | Late Romann | 3,100 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a location.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 30 | CHA30 | Karatepe | Settlement | Late Romann | 3,800 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | Particular attention should be paid to this area when choosing a location.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 31 | CHA31 | Karatepe | Tumuli | Roman | 2,800 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unknown | High | Unknown | Neutral | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
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| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| 32 | CHA32 | Karatepe | Tumuli | Roman | 60 m | 3 | 50-100 m<br>Medium | Unknown | High | Unknown | Moderate/<br>Large | Slight | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered. It has been damaged as a result of agricultural ploughing.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 33 | CHA33 | Sarılar | Tumuli | Roman | 30 m | 2 | 0-50 m<br>Risky | Registered | High | Unknown | Moderate/<br>Large | Slight | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 34 | CHA34 | Sarılar | Tumuli | Roman | 145 m | 4 | 100-150 M<br>LOW | Registered | High | Unknown | Slight | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
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| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | |
| | | | | | | | | | | | | | the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 35 | CHA35 | Balabanlı | Tumuli | Roman | 80 m | 3 | 50-100 m<br>Medium | Registered | High | Unknown | Slight | Neutral | The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 36 | CHA36 | Balabanlı | Cemetery | Early Rep. / Modern | 5 m | 2 | 0-50 m<br>Risky | NA | Low | Unknown | Moderate/ Large | Slight | It is situated at the edge of the shipping route, and it will likely be affected by any of the construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 37 | CHA37 | Çevrimkaya | Cemetery | Early Rep. / Modern | 5 m | 2 | 0-50 m<br>Risky | NA | Low | Unknown | Moderate/ Large | Slight | It is situated at the edge of the shipping route, and it will likely be affected by any of the construction works. During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
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| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| | | | | | | | | | | | | | As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 38 | CHA38 | Hüsnülü | Tumuli | Roman | 20 m | 2 | 0-50 m<br>Risky | Unregistered | High | Unknown | Moderate/<br>Large | Slight | It is located at the edge of the shipping route. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 39 | CHA39 | Hüsnülü | Settlement | Late Romann | 700 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located at the north border of the area known as Storage Area-6 (Hüsnülü). The area should be taken into account in site selection during construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 40 | CHA40 | Hüsnülü | Tumuli | Roman | 60 m | 3 | 50-100 m<br>Medium | Unregistered | High | Unknown | Slight | Neutral | It is located within the area known as Storage Area-6 (Hüsnülü). The area should be marked on constraint maps and taken into account in site selection during construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
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| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| | | | | | | | | | | | | | the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 41 | CHA41 | Hüsnülü | Settlement | Late Romann | 450 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | High | Unknown | Neutral | Neutral | It is located at the north border of the area known as Storage Area-6 (Hüsnülü). The area should be taken into account in site selection during construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 42 | CHA42 | Hüsnülü | Monumental Tree | Ottoman | On The Access Road | 1 | On The Access Road<br><br>High Risk | Unknown | Medium | Unknown | Slight | Neutral/<br><br>Slight | The monumental tree is in the village but at a point which is very close to the transportation route. It is recommended that the transport vehicles that will use this route should pass slowly and carefully through the settlement, in accordance with the HS rules. Furthermore, additional measures should be taken to prevent the risk of accidents in the area where the relevant monument tree is located. In addition, the Department of Conservation of Natural Assets of the Ministry of Environment, Urbanization and Climate Change should be notified.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 43 | CHA43 | Gazioğlu | Cemetery | Modern | 980 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. These areas should be taken into account during construction works and site selection. The site will likely be affected by construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
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| No | Findings Code | Village | Type | Period | Distance Between Nearest Project Component | Ranking | Explanation | | Value of Heritage Asset | Scale of Impact | Significance of Impact before Mitigation Measure | Significance of Residual Impact (After Mitigation Measures | |
| | | | | | | | | | | | | | on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 44 | CHA44 | Gazioğlu | Settlement | Byzantium-Ottoman | 500 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unregistered | Medium | Unknown | Neutral | Neutral | It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. These areas should be taken into account during construction works and site selection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 45 | CHA45 | Gazioğlu | Settlement | Byzantium | 45 m | 2 | 0-50 m<br><br>Risky | Unregistered | Medium | Unknown | Slight | Neutral | It is within the area determined for the main campsite and Concrete Batching Plant-2 towards the south of the village. These areas should be taken into account during construction works and site selection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 46 | CHA46 | Köseilyas | Cemetery | Modern | 75 m | 3 | 50-100 m<br><br>Medium | NA | Low | Unknown | Slight | Neutral | It is located at the north border of the area known as Storage Area-8 (Yenişehir). and lies towards the east of the village. The area should be taken into account in site selection during construction works. The site will likely be affected by any of the construction works. |

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| | | | | | | | | | | | | | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 47 | CHA47 | Yenişehir | Tumuli | Roman | 45 m | 2 | 0-50 m<br><br>Risky | Registered | High | Unknown | Slight | Neutral | It is located at the north of the area designated as Storage Area-8 (Yenişehir). The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is in a position that is visible from the points of the other tumuli in the region. It is recommended not to work in areas close to the tumulus, which is estimated to be registered.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 48 | CHA48 | Yağcı | Cemetery | Modern | 1,650 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | It is situated at the Storage Area-9 (Yağcı) and it will likely be affected by any of the construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
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| 49 | CHA49 | Ottoman | Building | Late Ottoman | 1,900 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 50 | CHA50 | Bıyıkali | Cemetery | Ottoman -Late Ottoman -Modern | 2,500 m | 5 | ABOVE 150 M.<br>NO EFFECT | Unregistered | Low | Unknown | Neutral | Neutral | It is situated at the northeast of the Bıyıkali basalt quarry that will likely be affected by any of the construction works.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 51 | CHA51 | Bıyıkali | Tumuli | Roman | 750 m | 5 | ABOVE 150 M.<br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali quarry plant. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed.<br>Despite the uncertainty on the state of registration of the aforementioned area the Directorate of the İstanbul Archaeology Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
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| | | | | | | | | | | | | | The construction works around the area require archaeological on-site monitoring. |
| 52 | CHA52 | Hacıköy | Tumuli | Roman | 1,500 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Registered | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali basalt quarry. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed.<br><br>Despite the uncertainty on the state of registration of the aforementioned area the Directorate of the İstanbul Archaeology Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged.<br><br>The construction works around the area require archaeological on-site monitoring. |
| 53 | CHA53 | Hacıköy | Cemetery | Modern | 2,400 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | NA | Low | Unknown | Neutral | Neutral | The site is located towards the west of the Bıyıkali basalt quarry and south of the villages entrance. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It will likely be affected by the construction works.<br><br>It is recommended that any construction activities conducted on or around the site should be subjected to archaeological on-site monitoring.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 54 | CHA54 | Hacıköy | Tumuli | Roman | 1,700 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unknown | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali basalt quarry. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
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| | | | | | | | | | | | | | on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 55 | CHA55 | Seymenli | Tumuli | Roman | 850 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unknown | High | Unknown | Neutral | Neutral | The site is located towards the south of the Bıyıkali quarry plant. The area should be marked on the constraint maps, and these areas should be taken into account in site selection during construction works. It is recommended not to work near the tumuli that are known to be registered. If any planning is to be done in these areas, the Directorate of the Tekirdağ Archaeology Museum should be informed.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 56 | CHA56 | Seymen | Cemetery | Early Rep.-Modern | 5 m | 2 | 0-50 m<br><br>Risky | NA | Low | Unknown | Moderate/<br><br>Large | Slight | It is at the edge of the road route and should be taken into account in site selection during construction works. It will likely be affected by any of the construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 57 | CHA57 | İnecik | Bath | Ottoman | 40 m | 2 | 0-50 m<br><br>Risky | Registered | Medium | Unknown | Moderate/ | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
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| | | | | | | | | | | | | | and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged.<br>The construction works around the area require archaeological on-site monitoring. |
| 58 | CHA58 | İnecik | Mosque | Ottoman | 90 m | 3 | 50-100 m<br>Medium | Registered | Medium | Unknown | Large | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged.<br>The construction works around the area require archaeological on-site monitoring. |
| 59 | CHA59 | İnecik | Government Office | Ottoman | 20 m | 2 | 0-50 m<br>Risky | Registered | Medium | Unknown | Moderate/ | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged. The construction works around the area require archaeological on-site monitoring. |
| 60 | CHA60 | İnecik | Ancient Bridge | Roman | 5 m | 2 | 0-50 m<br>Risky | Registered | High | Unknown | Large | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection. During the construction activities, this area needs to be marked and should be prevented from being damaged.<br>The construction works around the area require archaeological on-site monitoring. |
| 61 | CHA61 | İnecik | Settlement | Ottoman | On The Access Road | 1 | On The Access Road<br>High Risk | Registered | Medium | Unknown | | Moderate/<br>Large | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection.<br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Degree Archaeological Site by the Museum. The construction works around the area require |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | Registration Status | Impact Analysis as per ICOMOS Guidance | | | | Recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | |
| | | | | | | | | | | | | | archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 62 | CHA62 | İnecik | Road Remain | Ottoman | On The Access Road | 1 | On The Access Road<br><br>High Risk | Unknown | Low | Unknown | Neutral/<br><br>Slight | Neutral/<br><br>Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 63 | CHA63 | İnecik | Cemetery | Ottoman | 350 m | 5 | ABOVE 150 M.<br><br>NO EFFECT | Unknown | Low | Unknown | Neutral | Neutral | It is situated at the Concrete Batching Plant-3 and it will likely be affected by any of the construction works.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed.<br><br>As local people continue to visit the cemetery, they should not be adversely affected by the construction process by restricting or blocking their access to the cemetery. |
| 64 | CHA64 | İnecik | Settlement | Hellenistical-Roman | 55 m | 3 | 50-100 m<br><br>Medium | Unregistered | High | Unknown | Moderate/<br><br>Large | Slight | It is located within the mid to eastern edge of the area designated as Concrete Batching Plant-3. Since many archaeological areas are known to be found around this point this area should be taken into account during construction works and site selection. In this aspect, Museum-controlled trial excavations which will be realized during the pre-construction period are strongly recommended to evaluate the potential risks and for making plans for damage prevention. |

| | | | | | | Code Categorization (Interaction of the area with the Project) | | | Impact Analysis as per ICOMOS Guidance | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **No** | **Findings Code** | **Village** | **Type** | **Period** | **Distance Between Nearest Project Component** | **Ranking** | **Explanation** | **Registration Status** | **Value of Heritage Asset** | **Scale of Impact** | **Significance of Impact before Mitigation Measure** | **Significance of Residual Impact (After Mitigation Measures** | **Recommendation** |
| | | | | | | | | | | | | | During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |
| 65 | CHA65 | İnecik | Settlement | Late Ottoman | On The Plant Area | 1 | On The Plant Area<br><br>High Risk | Unregistered | Low | Unknown | Moderate/<br><br>Large | Slight | It is located within the area designated as Concrete Batching Plant-3 and also the village. These areas should be taken into account during construction works and site selection.<br><br>During the construction activities, this area needs to be marked and should be prevented from being damaged. It is recommended that the Directorate of the relevant Archaeological Museum should be informed of its existence to carry out on-site field inspections and if needed for registration to ensure its protection. If an on-site inspection will be done the archaeological area in mention could be proposed for being declared either as a 1st or 3rd Degree Archaeological Site by the Museum. The construction works around the area require archaeological on-site monitoring. The notifications of the museum directorate should be followed. |

**APPENDIX-2:** Chance Find Procedure



# KINALI-MALKARA MOTORWAY
# PROJECT KINALI-MALKARA SECTION
# CHANCE FIND PROCEDURE

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APRIL/2023

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## APPENDICES

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APPENDIX B: CHANCE FINDS REGISTER

## ABBREVIATIONS

| | |
|---|---|
| **CHMP** | Cultural Heritage Management Plan |
| **ICOMOS** | International Council of Monuments and Sites |
| **IFA** | Institute of Field Archaeologists |
| **No** | Number |
| **PROJECT** | Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project<br>Kınalı -Malkara Section |
| **UNESCO** | United Nations Educational, Scientific and Cultural Organization |

## 1. PURPOSE

The purpose of this Archaeological Chance Find Procedure is to provide guidance to all parties and employees regarding the actions to be taken in case of discovery of an archaeological asset.

## 2. SCOPE

It is likely to encounter archeological findings during the construction activities of the Project. Any type of activity requiring excavation or any type of intervention on the landscape through earthworks has potential to lead to discovery or destroying of archeological entities.

## 3. PROCEDURE

Any physical remains of past human activity, including artifacts, plant and animal remains, structural remains and soil features are defined as archaeological entities. All actions to be carried out in case of discovery of an archaeological entity should comply with the Law on Cultural and Natural Assets Conservation Law Numbered 2863 (Law Number: 2863, Date of Approval: 21.7.1983, Publication in the Official Gazette: Date: 23/7/1983 No: 18113).

In the event of discovery of an archaeological entity, the following procedure shall be implemented:

- All construction and other relevant activities in the vicinity of the chance find will be ceased by the Archaeologist of the Project Owner or anyone, who encounters a chance find.
- Project archaeologist will contact construction manager as soon as a chance find is encountered.
- Project archaeologist will contact museum directorate archaeologist immediately.
- Archaeologist of the Project will properly secure chance find site via flagging, no-entry signs, etc. and prevent/limit the vehicle traffic within the immediate vicinity of chance find and also protect the site by not moving, removing or further disturbing the chance find.
- Boundaries of discovered archaeological site coordinates will be recorded and photograph of the location and the finding will be taken and also video record will be made.
- The site and its vicinity will be secured against damage or loss until a final decision is made about this site by the Board.
- Archaeologist of Project will fill out Part A of Chance Find Form and send a copy to Museum archaeologist within 24 hours keeping a copy as a record,
- If any human remains such as contemporary grave or graveyard are noticed, security forces will be informed. Unless the remains are determined to be recent, the local administration (village head: mukhtar, or district governor) has the full authority.
- Further steps to be followed and proper procedures to be implemented for the management of the finding(s) (changes in the layout, conservation, preservation, restoration or salvage) will be decided and reported in writing by the Museum Directorate.
- In case the site is considered to be of no significance by the Museum Directorate, Project archaeologist will inform the Construction Manager and they will inform their managers. Subsequent of filling out Part B of Chance Find Form by Archaeologist of Project within

24 hours while retaining a copy of the Chance Find form as a record, the construction works will proceed since no further actions are required.

- In case the site is considered to be of significance by the Museum Directorate, Project archaeologist will be informed by the Museum Directorate about the decision on the further actions. Project archaeologist will inform the construction manager and their managers. Subsequent of filling out Part B of Chance Find Form by Archaeologist of Project within 24 hours while retaining a copy of the Chance Find form as a record, the instructions of the Museum Directorate will be followed. After field investigation, Museum Directorate will declare their decision on the significance of the site and the actions to be followed as per their decision are summarized in Table 1.

*Table 1: Actions to be followed*

| Site to be of no Significance | Site to be of Minor Significance | Site to be of Major Significance |
|---|---|---|
| ✓ Project's archaeologists/relevant personnel will inform their managers,<br>✓ Archaeologist of the Project will record the decision in Part C of Chance Find Form within 24 hours,<br>✓ Archaeologist of the Project will retain a copy of Chance Find form as a record,<br>✓ No further actions will be required,<br>✓ This step closes out the chance find procedure,<br>✓ Construction activities may resume. | ✓ A salvage excavation is to be completed<br>✓ Museum Directorate will provide instructions, and/or supervision for salvage archaeological excavation Project archaeologist,<br>✓ Project's archaeologists will inform their managers,<br>✓ Under the guidance of Museum archaeologist (following instructions from other authorities, Edirne or İstanbul 1 No Regional Board etc.), Project will provide a team of qualified archaeologist to conduct the salvage excavation,<br>✓ Once the excavation is completed, Archaeologist of Project will provide a report to construction manager,<br>✓ Project archaeologist will provide a report to the Museum Directorate,<br>✓ Regional Board Directorate of Protection of Cultural Heritage will officially confirm the completion of recovery and inform Project archaeologist,<br>✓ Project archaeologist will inform the construction manager that no further actions are required,<br>✓ Project's archaeologists will inform their managers,<br>✓ Archaeologist of Project will record the decision in Part C of Chance Find Form within 24 hours,<br>✓ Archaeologist of Project will retain a copy of Chance Find form as a record,<br>✓ No further actions will be required,<br>✓ This step closes out the chance find procedure<br>✓ Construction activities may resume. | ✓ An excavation is to be completed,<br>✓ Site will be treated according to "Law on the Conservation of Cultural and Natural Property (2863)",<br>✓ Museum Directorate will provide instructions, and/or supervision for salvage archaeological excavation to Project archaeologist,<br>✓ Project's archaeologists will inform construction manager and their managers,<br>✓ Under the guidance of Museum archaeologist (following instructions from other authorities, Edirne or İstanbul 1 No Regional Board etc.), Project will provide a team of qualified archaeologist to conduct the salvage excavation,<br>✓ Once the excavation is completed, Archaeologist of Project will provide a report to construction manager,<br>✓ Project archaeologist will provide a report to the Museum Directorate,<br>✓ Regional Board Directorate of Protection of Cultural Heritage will officially confirm the completion of recovery and inform Project archaeologist,<br>✓ Site will be officially recorded and protected according to Turkish regulations,<br>✓ Project archaeologist will inform the construction manager that no further actions are required, or that a relocation is required,<br>✓ Project's archaeologists will inform their managers,<br>✓ Archaeologist of Project will record the decision in Part C of Chance Find Form within 24 hours,<br>✓ Archaeologist of Project will retain a copy of Chance Find form as a record,<br>✓ No further actions will be required,<br>✓ This step closes out the chance find procedure,<br>✓ Construction activities may resume, or relocation is implemented. |

**APPENDIX-A:**

CHANCE FIND REPORT FORM

RASLANTISAL BULUNTU RAPOR FORMU

To be filled out in English
Ingilizce doldurunuz

| **PART A BÖLÜM A** | | |
|---|---|---|
| Location:<br>*Mevkii* | Date:<br>*Tarih* | ID: |
| Name of person reporting the chance find:<br>*Rastlantısal buluntuyu rapor eden kişinin ismi* | | |
| Name of contractor employee contacted:<br>*İletişime geçilen yüklenici çalışanı ismi* | | |
| Was work stopped in the immediate vicinity of chance find?<br>*Rastlantısal buluntunun tam çevresinde iş durduruldu mu?* | ☐ Yes *Evet* | ☐ No *Hayır* |
| Was a buffer zone created to protect chance find?<br>*Rastlantısal buluntuyu korumak için tampon bölge oluşturuldu mu?* | ☐ Yes *Evet* | ☐ No *Hayır* |
| **NOTIFICATION**<br>***BİLDİRİM*** | | |
| Contractor construction manager contacted<br>*Yüklenici inşaat müdürü ile irtibata geçildi* | ☐ Yes *Evet* | ☐ No *Hayır* |
| PROJECT archaeologist contacted<br>*PROJE arkeoloğu ile iletime geçildi* | ☐ Yes *Evet* | ☐ No *Hayır* |
| **CHANCE FIND DETAILS**<br>***RASLANTISAL BULUNTU AYRINTILARI*** | | |
| GPS coordinates<br>*GPS koordinatları* | Photo record ☐Yes ☐No<br>(HD quality – no cell phone photos)<br>*Fotoğraf kaydı Evet Hayır*<br>*(HD kalitesinde – cep telefonu fotoğrafı değil)*<br>If not, explain why:<br>*Yok ise nedenini açıklayınız*<br><br>Other records ☐Yes ☐<br>No Specify (drawings, HD quality videos, etc.): *Diğer kayıtlar Evet*<br>*Hayır Belirtin*<br>*(çizimler, HD kalite videolar, vb.)* | |

| |
|---|
| Description of chance find:<br>*Rastlantısal buluntunun tanımı* |
| Description of site and vegetation: (e.g. surface sediment type, ground surface visibility, distance to closest watercourse, etc.)<br>*Sahanın ve bitki örtüsünün tanımı: (örn. Yüzey sediman türü, yüzey zemin görünürlüğü, en yakın suyoluna olan mesafe, vb.)* |
| **PART B**<br>***BÖLÜM B*** |
| **NOTIFICATION OF_____MUSEUM DIRECTORATE ARCHAEOLOGIST**<br>***_____MÜZE MÜDÜRLÜĞÜ ARKEOLOĞUNA BİLDİRİ*** |
| PROJECT archaeologist contacted museum directorate archaeologist ☐Yes ☐No<br>*PROJE arkeoloğu müze müdürlüğü arkeoloğu ile irtibata geçti. Evet Hayır*<br><br>Date of notification:<br>*Bildirim tarihi*<br><br>Name of the museum directorate archaeologist :<br>*Müze müdürlüğü arkeoloğunun ismi*<br><br>Contact number of museum directorate archaeologist:<br>*Müze müdürlüğü arkeoloğunun iletişim numarası* |
| **DECISION OF_____MUSEUM DIRECTORATE ARCHAEOLOGIST**<br>***_____MÜZE MÜDÜRLÜĞÜ ARKEOLOĞUNUN KARARI*** |
| Date of initial investigation:<br>*İlk araştırma tarihi* |
| ☐ Site of no significance - Construction to proceed with no further investigation – End of chance find procedure<br>*Önemsiz saha – İnşaat daha fazla araştırma yapılmadan devam edilebilir – rastlantısal buluntu prosedürün sonu.*<br><br>Date of notice to resume work :<br>*İşe başlama tarihi bildirisi* |
| ☐ Site of significance - Further investigation required<br>*Önemli saha – Ek araştırma gerekmektedir*<br><br>Fill out Part C<br>*Bölüm C'yi doldurun.* |
| Name of the museum directorate archaeologist:<br>*Müze müdürlüğü arkeoloğunun ismi*<br><br>Contact information:<br>*İletişim numarası* |
| PROJECT construction manager contacted ☐ Yes ☐ No<br>*PROJE inşaat müdürü ile irtibata geçildi Evet Hayır* |
| Contractor archaeologist contacted ☐ Yes ☐ No<br>*Yüklenici arkeoloğu ile irtibata geçildi Evet Hayır* |

| | | |
|---|---|---|
| **PART C**<br>***BÖLÜM C*** | | |
| FURTHER FIELD INVESTIGATION<br>*EK SAHA ARAŞTIRMASI* | | |
| ☐ Site of no significance<br>*Önemsiz saha* | ☐ Site of minor significance<br>*Az önemli saha* | ☐ Site of major significance<br>*Çok önemli saha* |
| Describe additional work to be conducted:<br>*Yapılması gereken ek işlerin tanımları* | | |
| Date started:<br>*Başlangıç tarihi* | Date completed:<br>*Bitiriş tarihi* | |
| Date of notice to resume work :<br>*İşe başlama tarihi bildirisi* | | |
| Name of museum directorate archaeologist:<br>*Müze müdürlüğü arkeoloğunun ismi:*<br><br>Contact information:<br>*İletişim numarası* | | |
| Construction manager contacted<br>*İnşaat müdürü ile irtibata geçildi* | ☐ Yes<br>*Evet* | ☐ No<br>*Hayır* |
| PROJECT archaeologist contacted<br>*PROJE inşaat müdürü ile irtibata geçildi* | ☐Yes<br>*Evet* | ☐No<br>*Hayır* |

**APPENDIX B:** CHANCE FINDS REGISTER

| | |
|---|---|
| | **CHANCE FIND REGISTER** |
| | **Reporting Period:** |

| **Total of chance find** | |
|---|---|
| **To date** | **To date** |
| | |

| ID (*) | DATE OF CHANCE FIND | LOCATION | CHANCE FIND SUMMARY | NAME OF AUTHORITY NOTIFIED | DATE PART A COMPLETED | DATE PART B COMPLETED | DATE PART C COMPLETED | ACTION TAKEN | STATUS OPEN OR CLOSED | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| Project 1 | | | | | | | | | | |
| Project 2 | | | | | | | | | | |
| Project 3 | | | | | | | | | | |
| Project 4 | | | | | | | | | | |

(*) Keep same ID format

**APPENDIX 3:** Contact Information of Related Museum Directorates and Regional Board Directorates

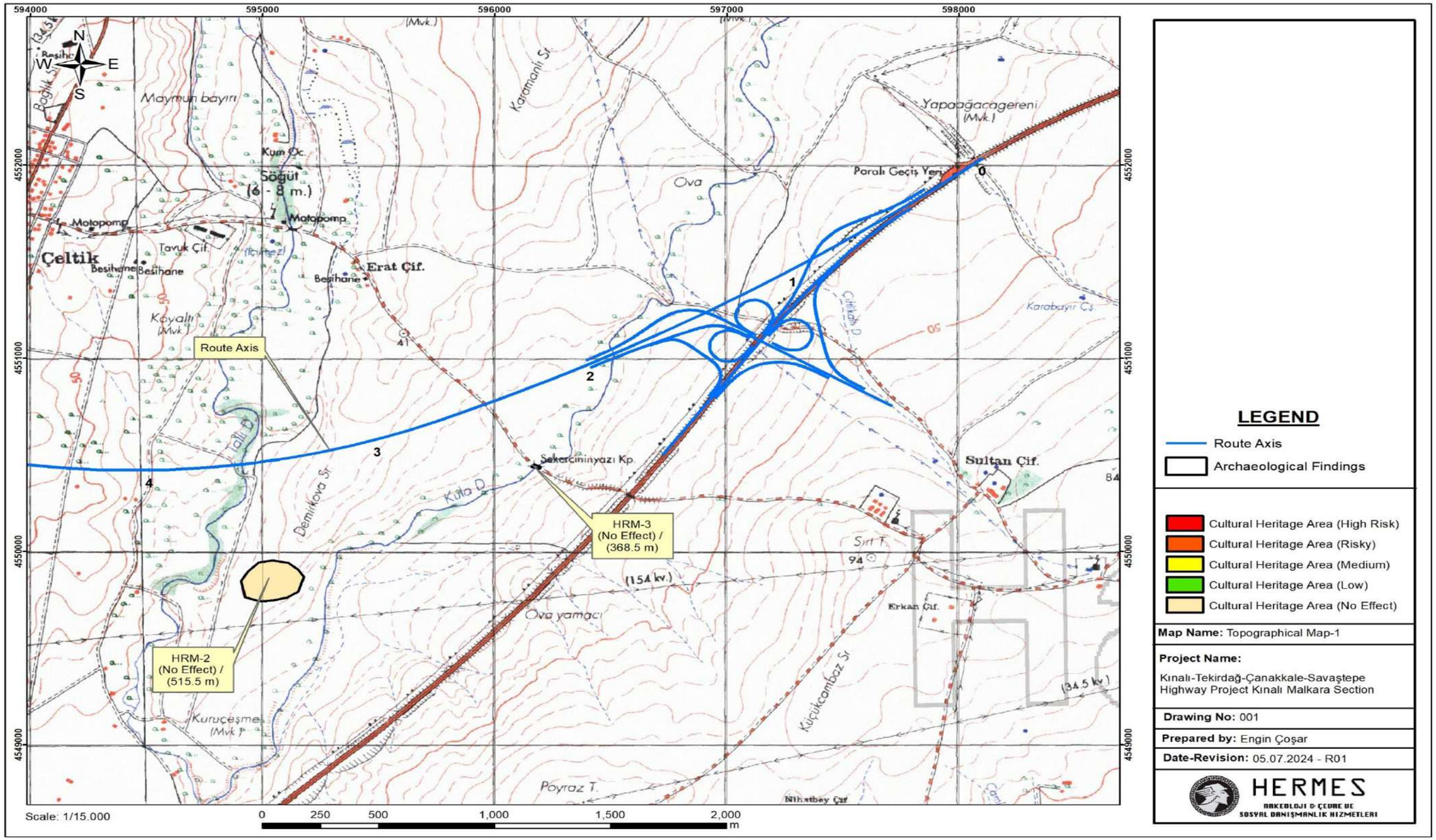
*Museum Contact Information*

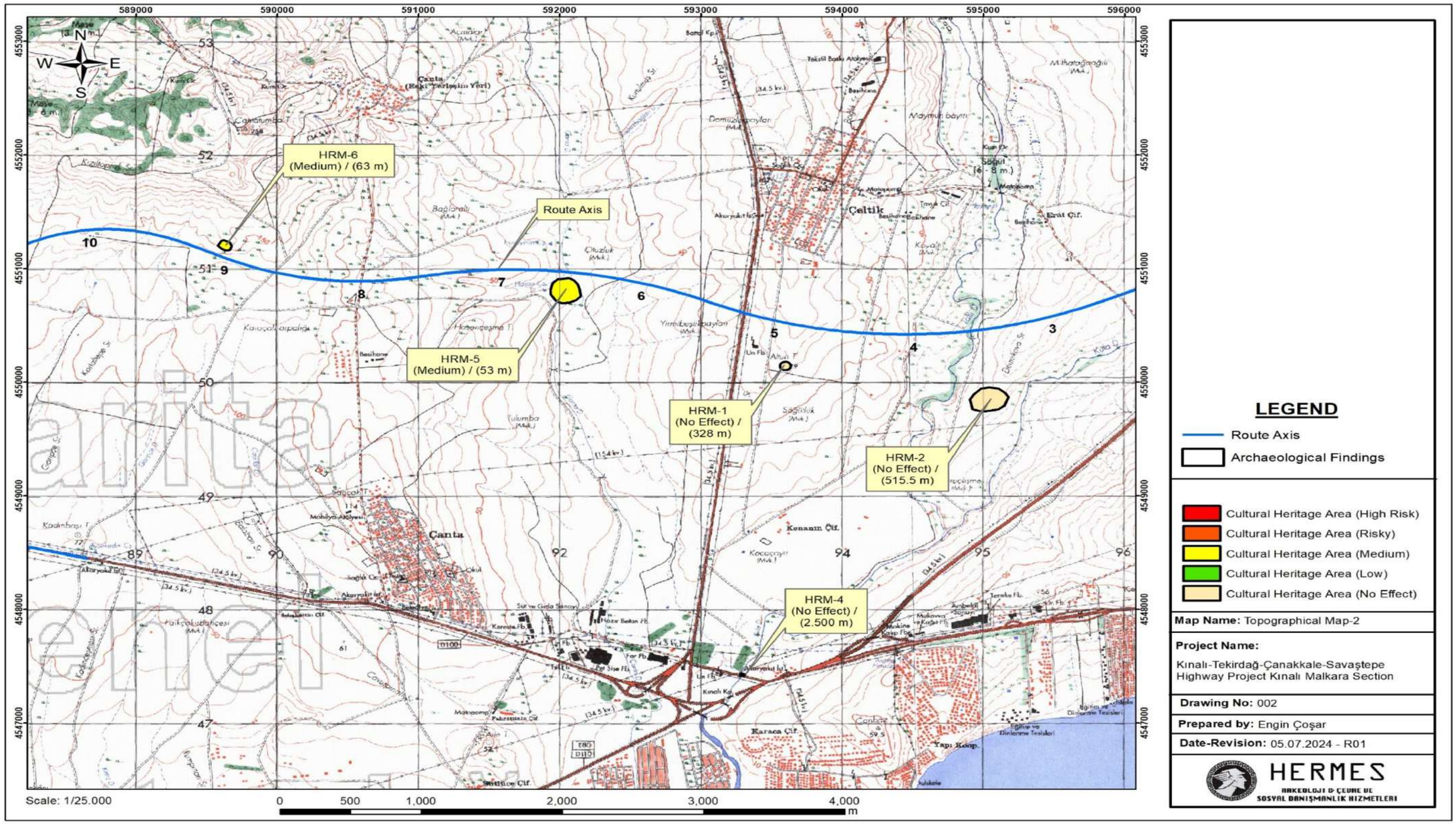
| Name | Phone | Adress |
|---|---|---|
| **Istanbul Archaeology Museum Directorate** | 0212 520 77 40 | Alemdar Caddesi,Osman Hamdi Bey Yokuşu,Gülhane İSTANBUL |
| **Tekirdağ Archaeology Museum Directorate** | 0 (282) 261 20 82 | Ertuğrul Mah. Rakoczi Cad. No:1 TEKİRDAĞ |

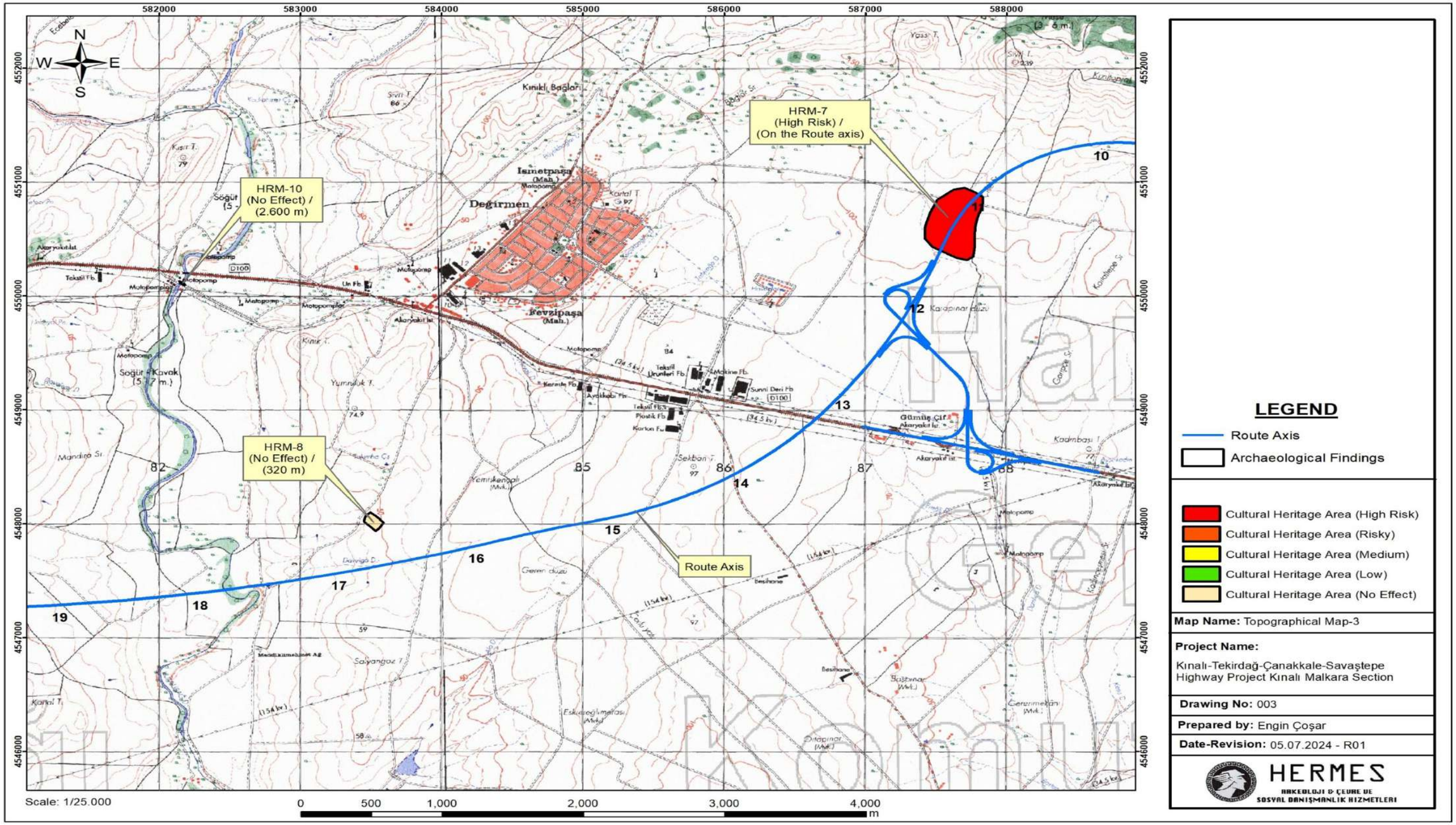
*Contact Information of Regional Board Directorates*

| Name | Phone | Adress |
|---|---|---|
| **Istanbul 1 No Cultural Assets Regional Board Directorate** | (0212) 528 24 78 | Hobyar Mahallesi Hamidiye Caddesi Elkon İş Hanı No:5 Kat:3 Sirkeci/Fatih/ İSTANBUL |
| **Edirne Cultural Assets Regional Board Directorate** | 0284 213 04 91 | Mithatpaşa Mah. Maarif Cad. No:20 Merkez/EDİRNE |

**APPENDIX 4:** Maps of Archaeological Findings




HRM-6
(Medium) / (63 m)
Route Axis
HRM-5
(Medium) / (53 m)
HRM-1
(No Effect) /
(328 m)
HRM-2
(No Effect) /
(515.5 m)
HRM-4
(No Effect) /
(2.500 m)
Çanta
Çaltık
Karaca Cif.
Scale: 1/25.000
0 500 1,000 2,000 3,000 4,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Topographical Map-2
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 002
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
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SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-3

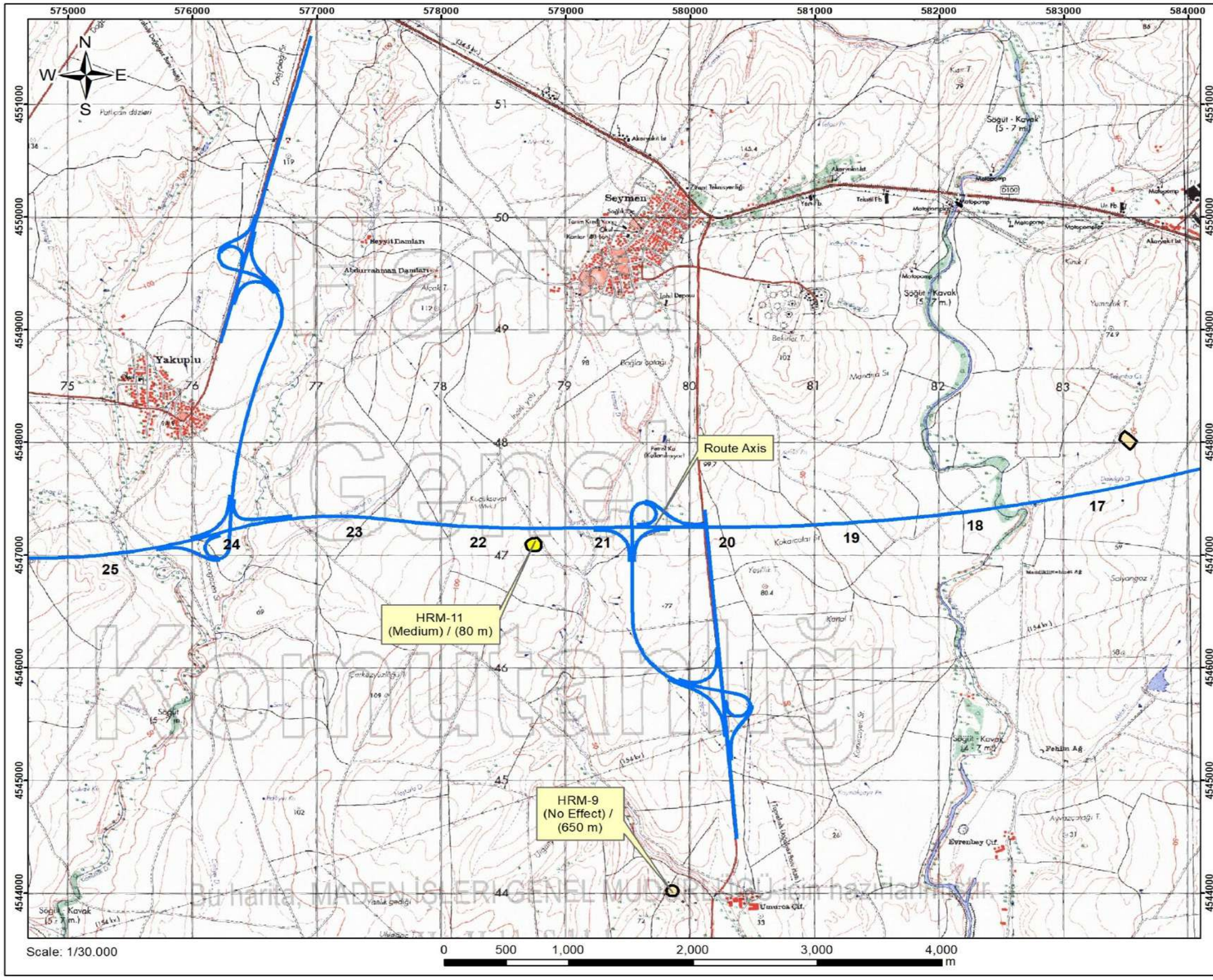
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

**Drawing No:** 003

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

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## LEGEND

- Route Axis
- Archaeological Findings

- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-4

**Project Name:**

Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

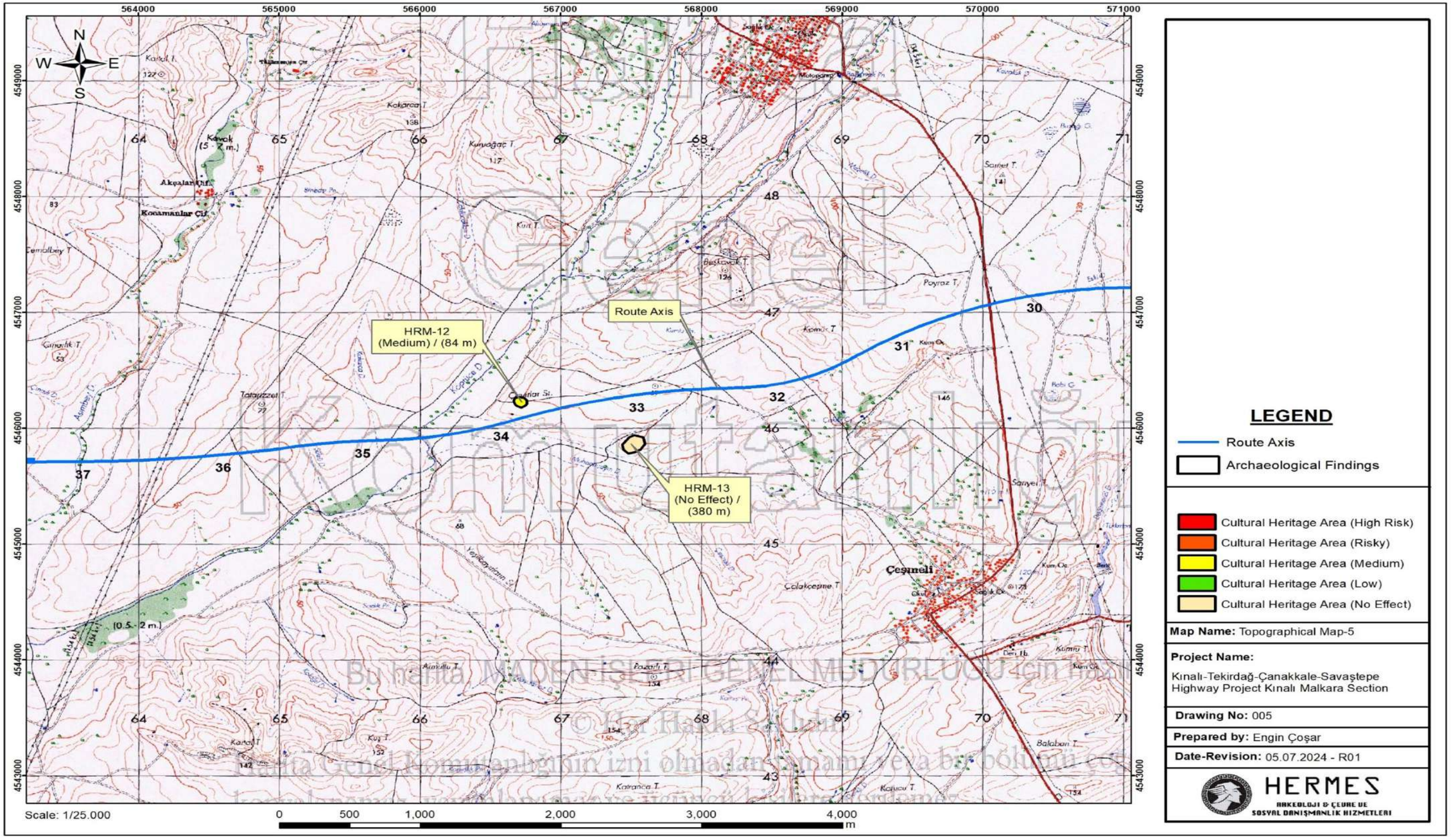
**Drawing No:** 004

**Prepared by:** Engin Çoşar

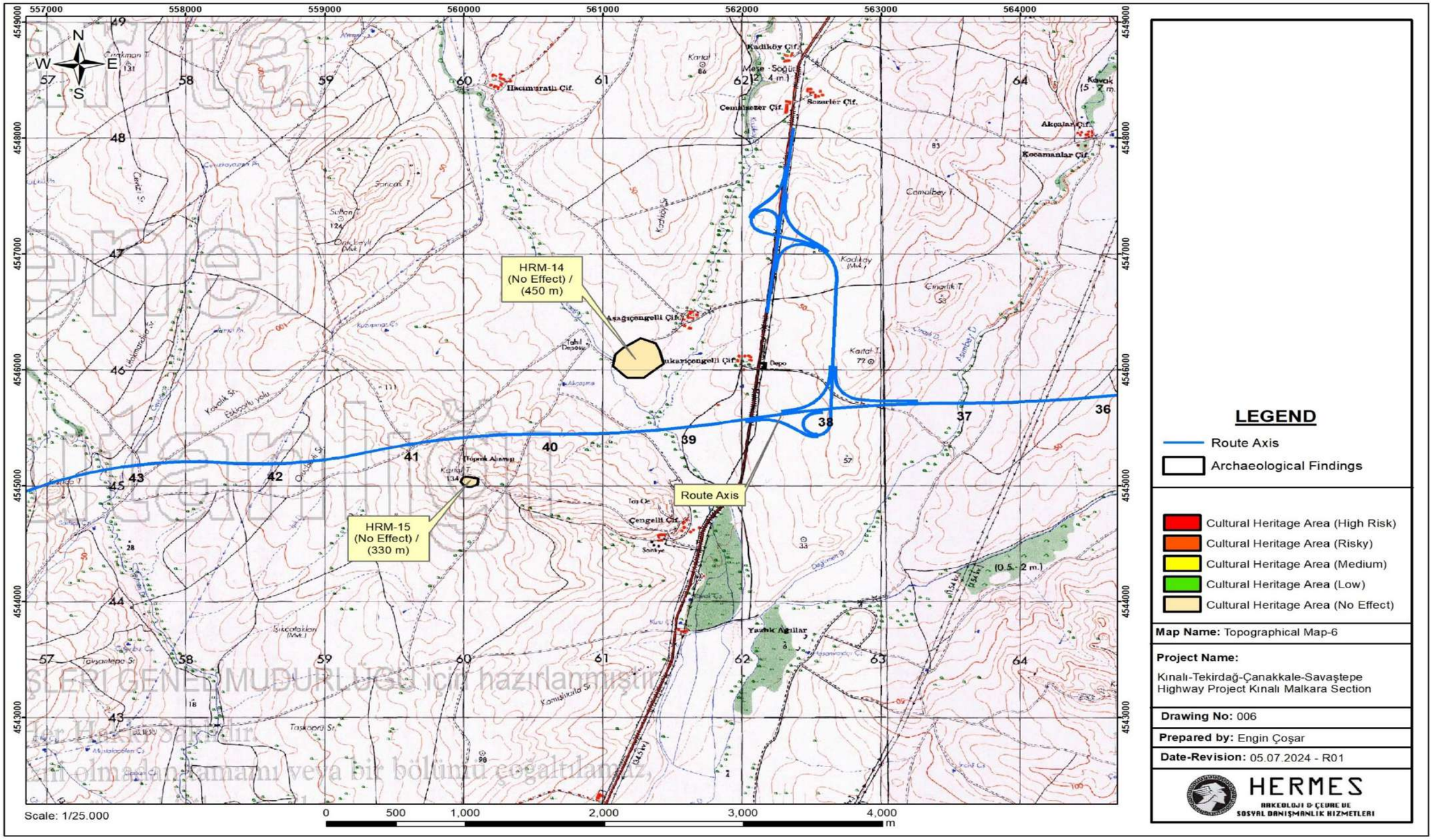
**Date-Revision:** 05.07.2024 - R01

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SOSYAL DANIŞMANLIK HİZMETLERİ

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## LEGEND

- Route Axis
- Archaeological Findings

- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-6

**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

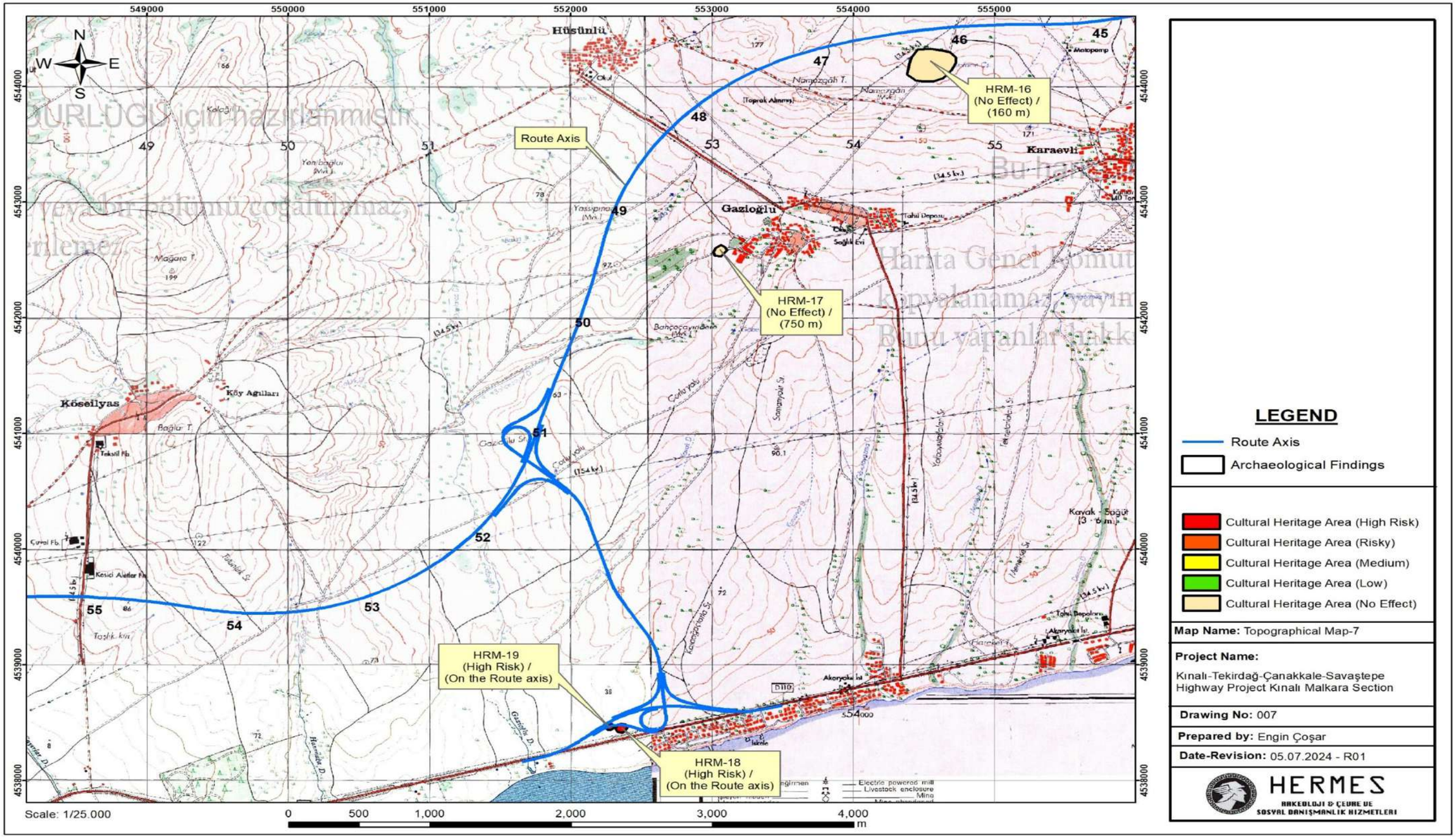
**Drawing No:** 006

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

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ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ

ŞLERİ GENEL MÜDÜRLÜĞÜ için hazırlanmıştır.
ler Hakları saklıdır.
zin olmadan tamamı veya bir bölümü çoğaltılamaz,




**LEGEND**

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-7

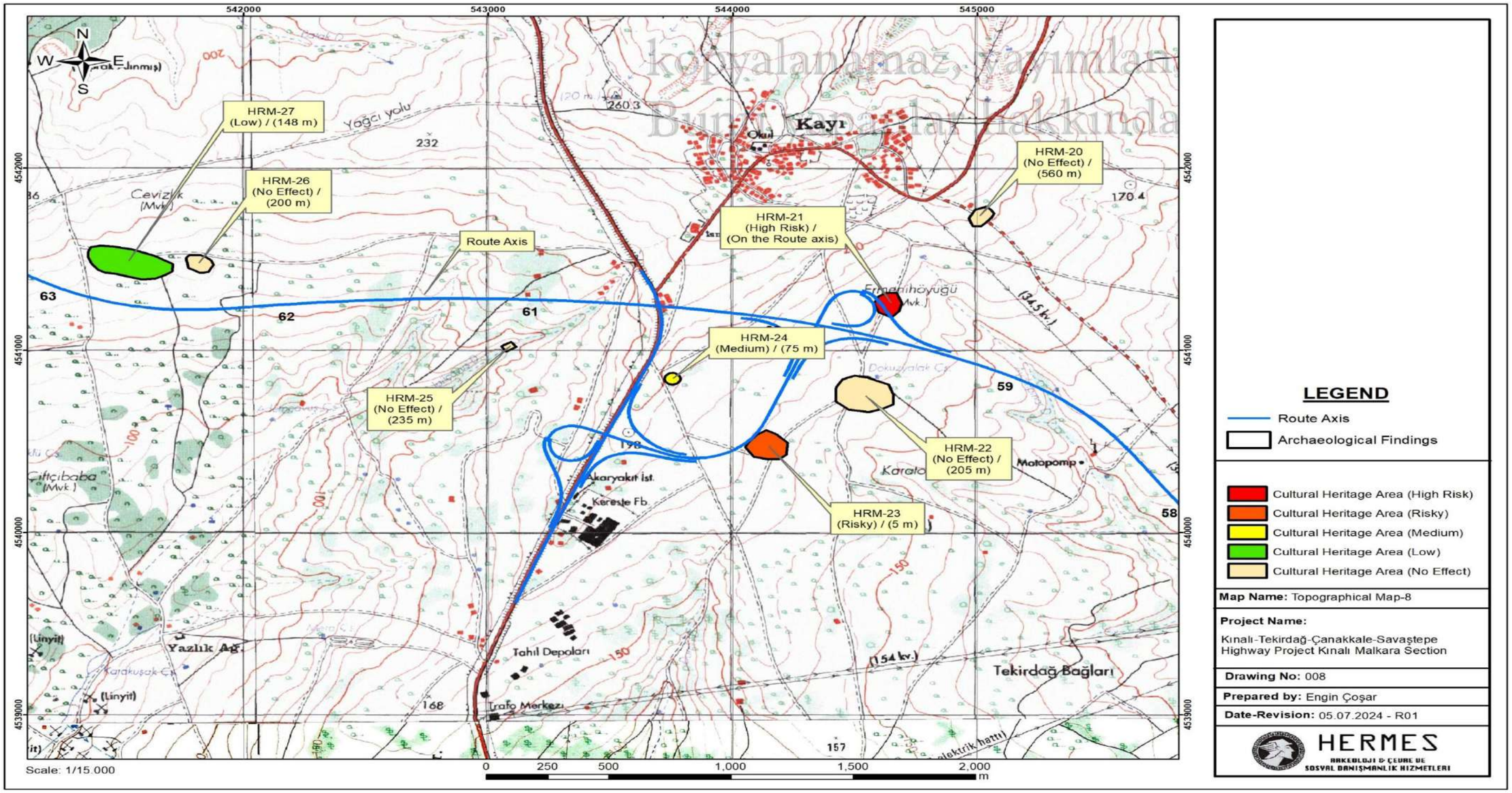
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

**Drawing No:** 007

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




kopyalanamaz, yayımlanamaz
Bunun tüm hakları saklıdır

**LEGEND**

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-8

**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

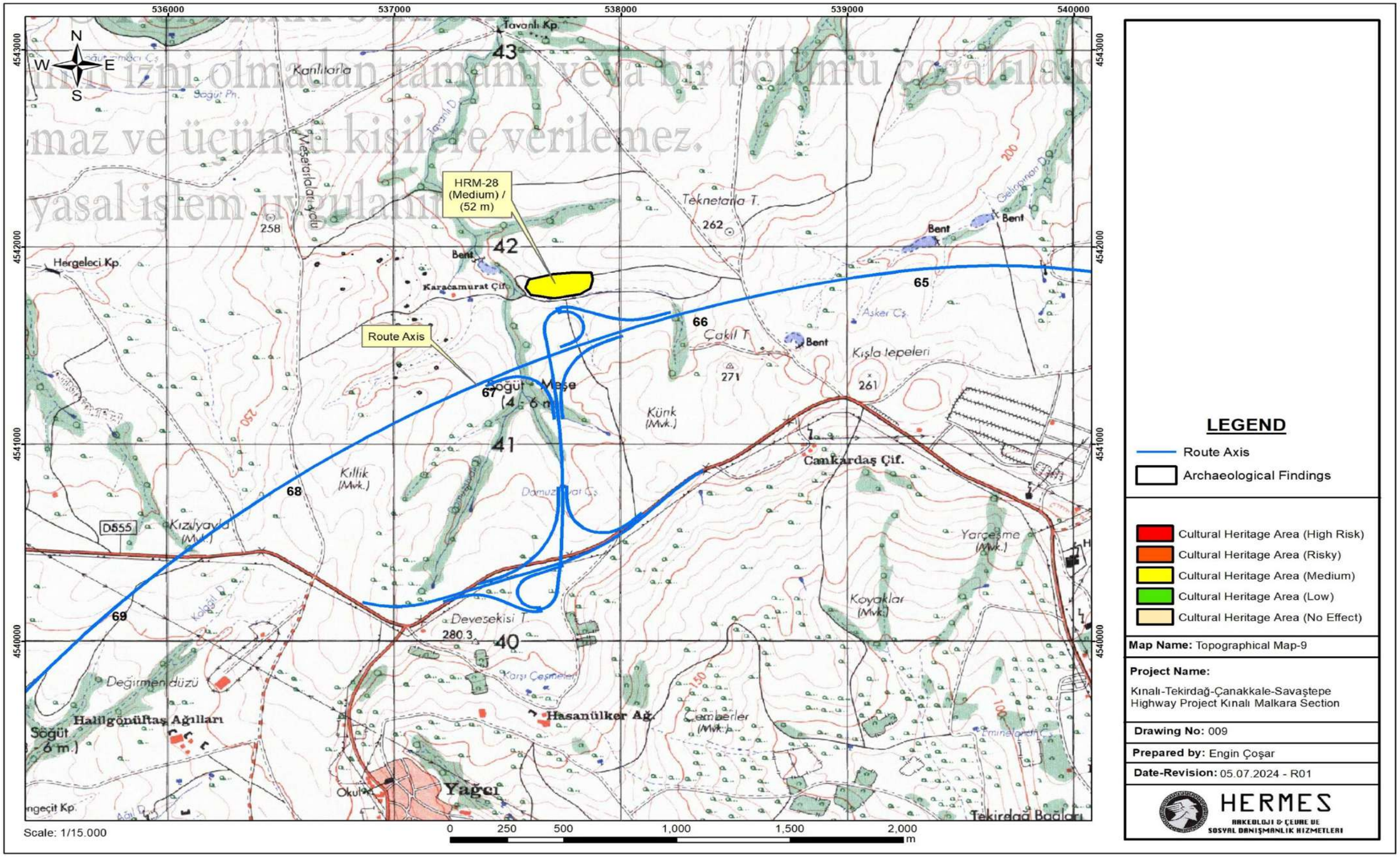
**Drawing No:** 008

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ

...izni olmadan tamamı veya bir bölümü çoğaltılamaz ve üçüncü kişilere verilemez. yasal işlem uygulanır.




## LEGEND

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-9

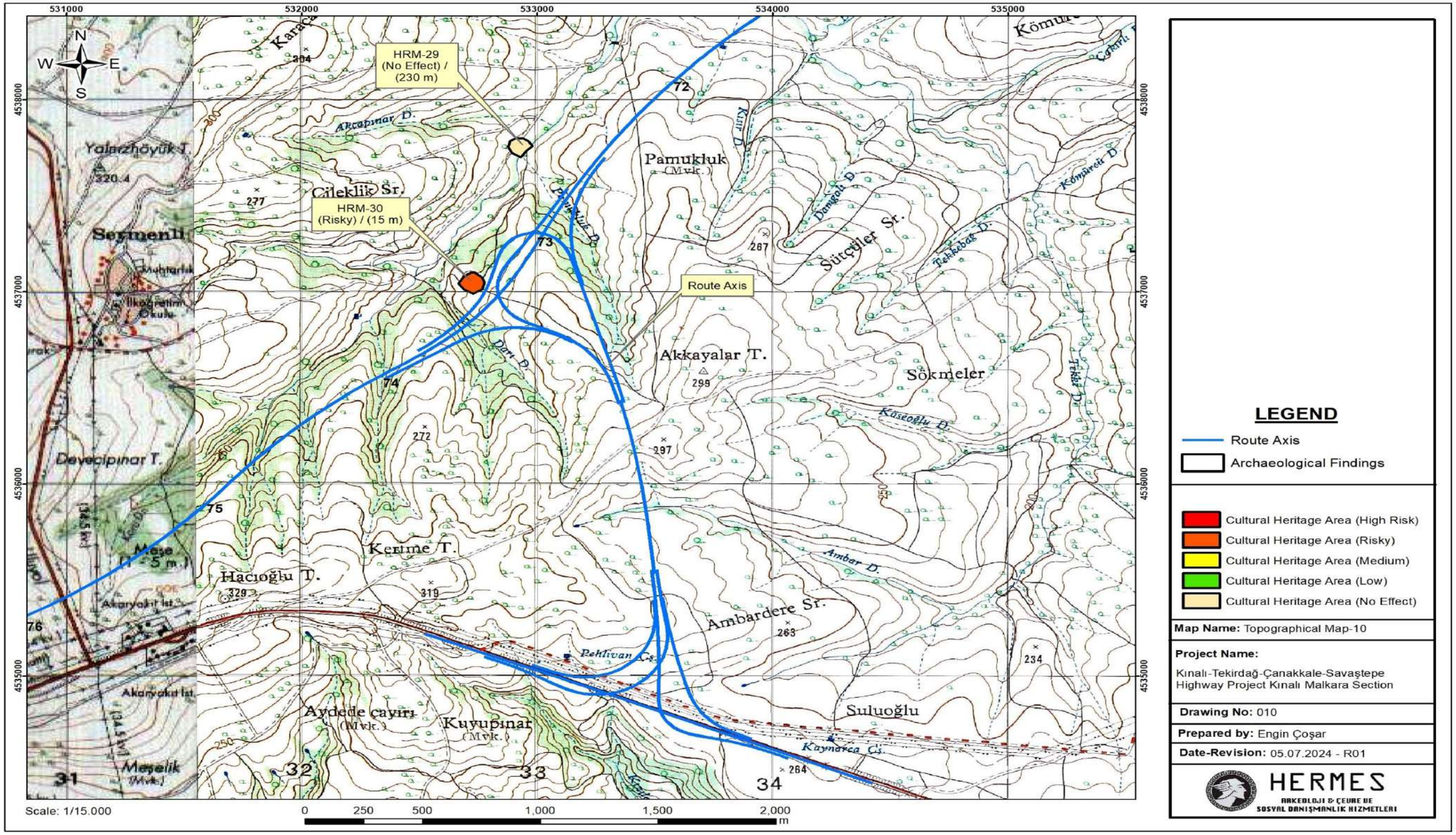
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

**Drawing No:** 009

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings

- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-10

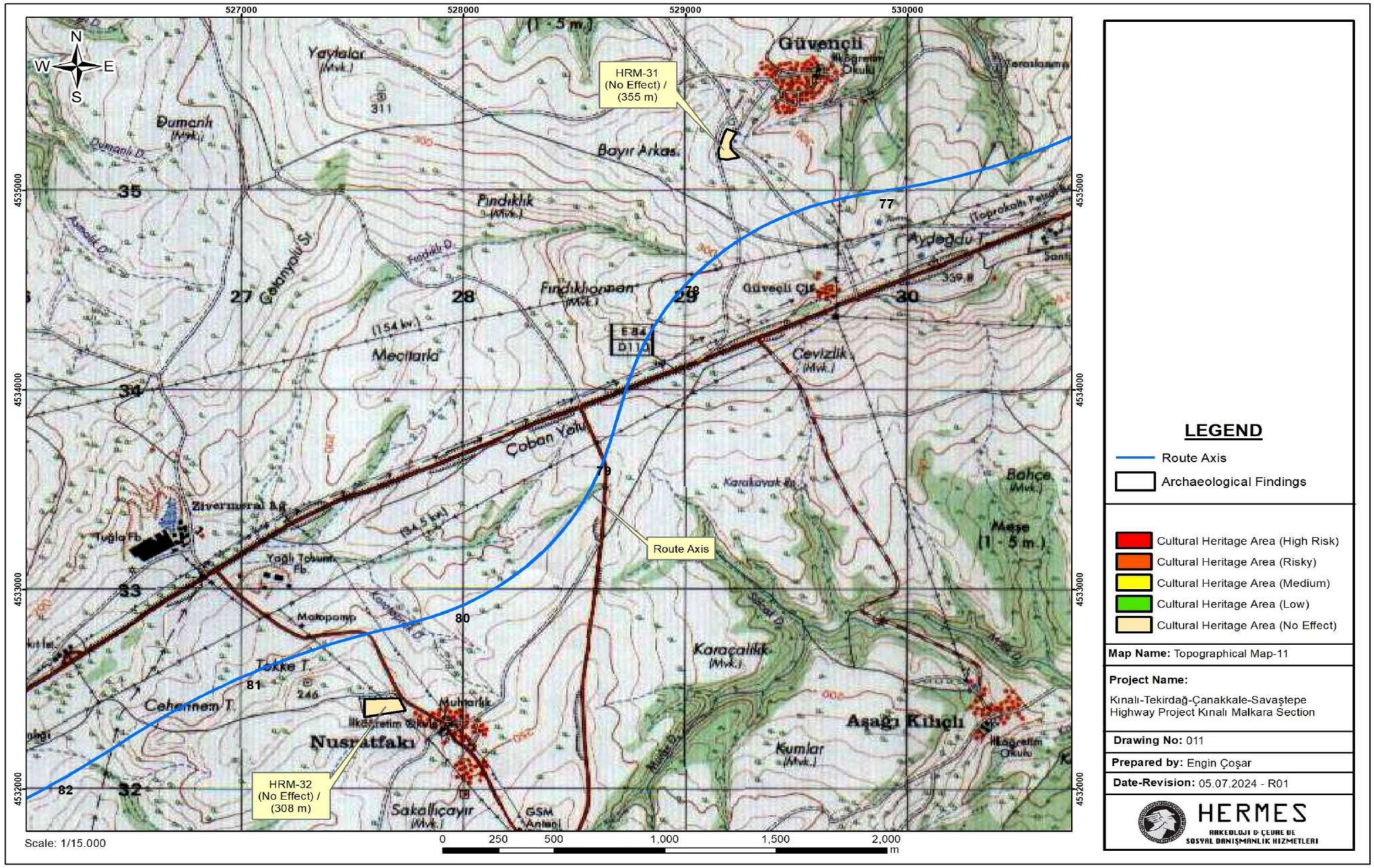
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

**Drawing No:** 010

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings

- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-11

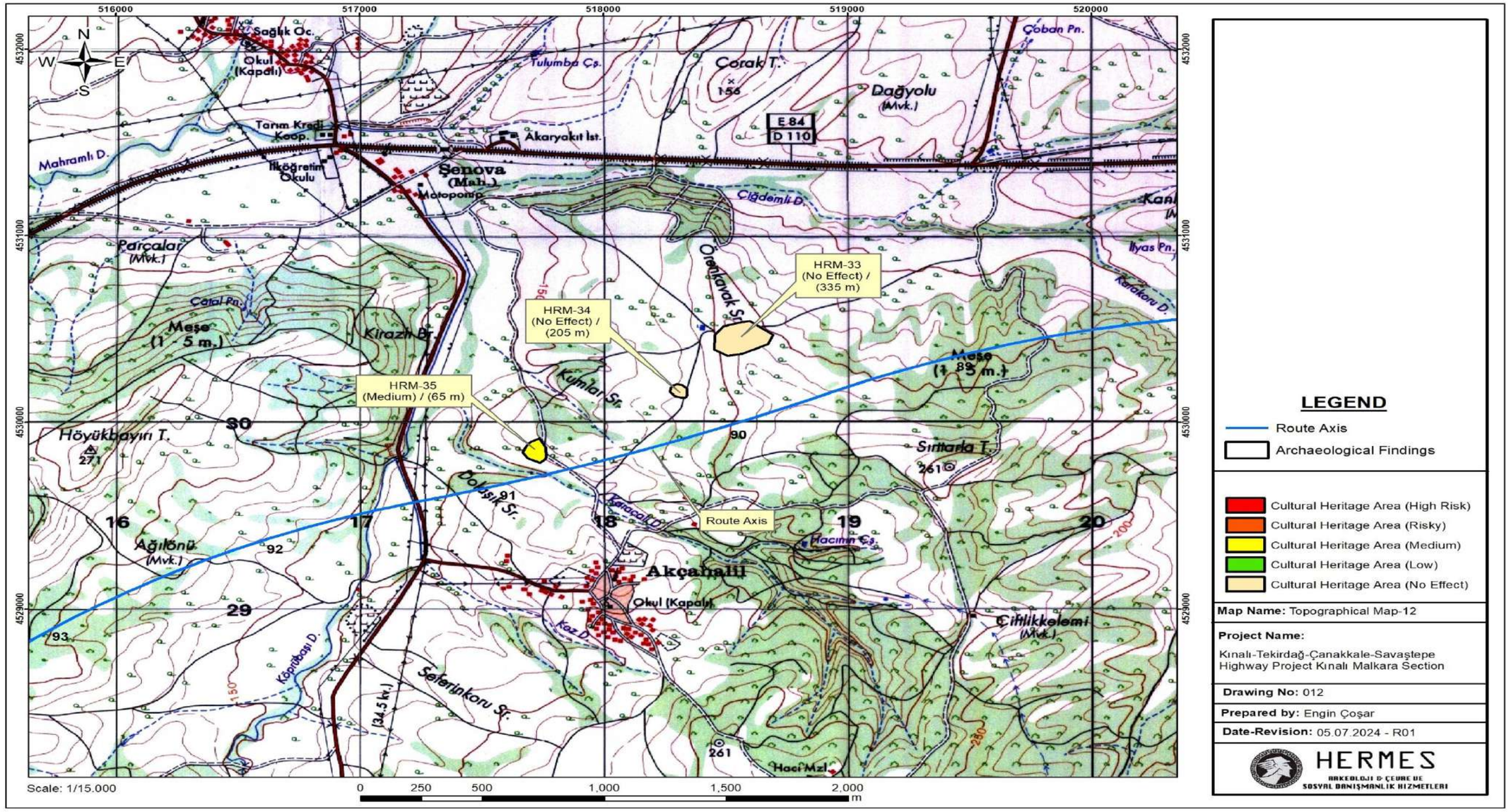
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

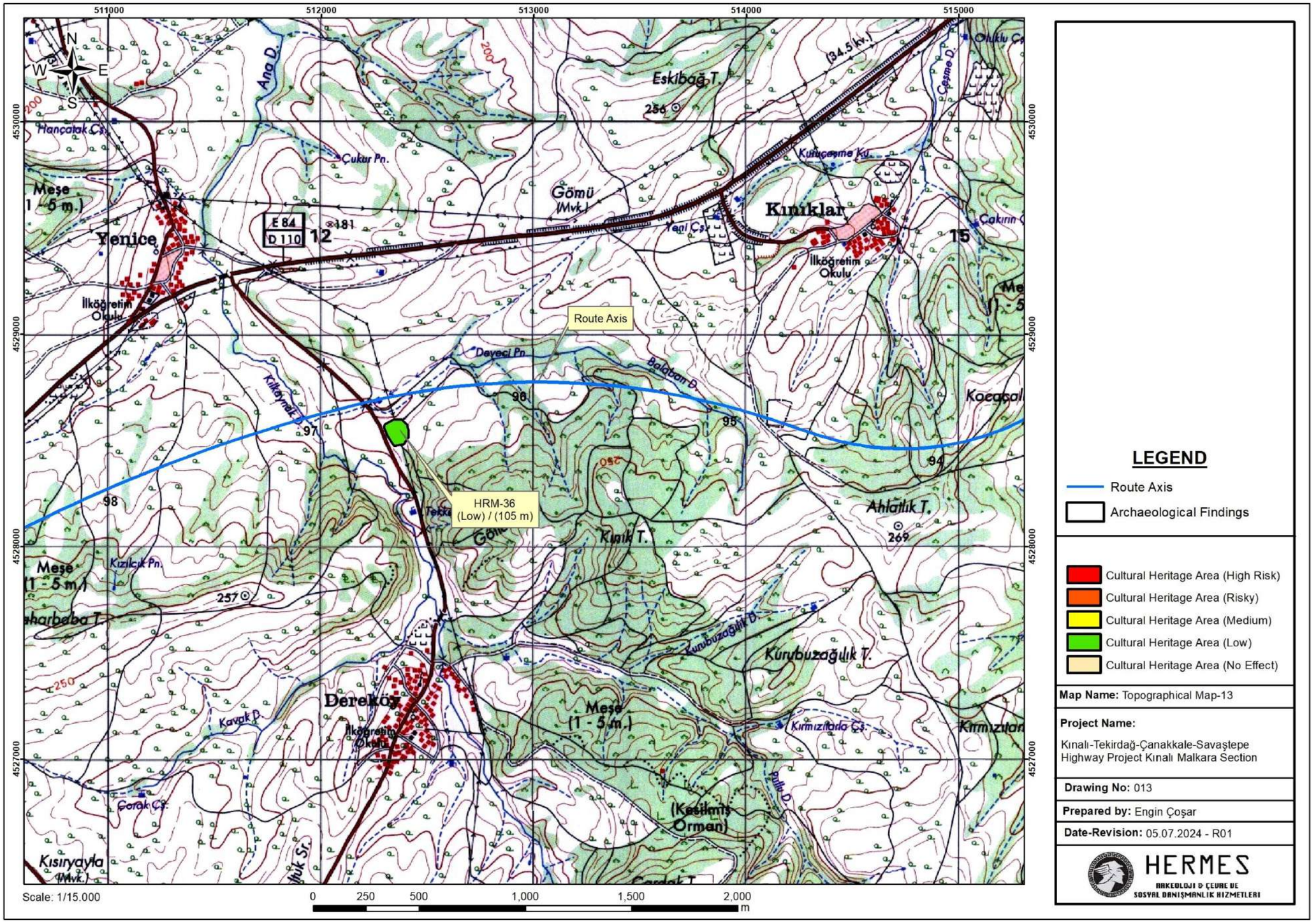
**Drawing No:** 011

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


516000
517000
518000
519000
520000
4532000
4531000
4530000
4529000
N
W
E
S
Sağlık Oc.
Okul (Kapalı)
Tulumba Çş.
Corak T.
156
Çoban Pn.
Dağyolu (Mvk.)
E 84
D 110
Tarım Kredi Koop.
Akaryakıt İst.
Mahramlı D.
İlköğretim Okulu
Şenova (Mah.)
Motopolis
Çiğdemli D.
Parçalar (Mvk.)
Çatal Pn.
Meşe (1 - 5 m.)
Kirazlı Bt.
HRM-33 (No Effect) / (335 m)
HRM-34 (No Effect) / (205 m)
HRM-35 (Medium) / (65 m)
Kumlar Sr.
Meşe (1 -5 m.)
Höyükbayırı T.
271
30
90
Sınarla T.
261
Dolışık Sr.
91
Karaçal D.
Route Axis
16
17
18
19
20
Ağılönü (Mvk.)
92
Akçahalil
Hacımın Çş.
29
Okul (Kapalı)
Çiftlikkelemi (Mvk.)
93
Kaz D.
Köprübaşı D.
150
(34.5 kv.)
Şeferinkoru Sr.
261
Hacı Mzl.
200
250
Scale: 1/15.000
0
250
500
1,000
1,500
2,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Topographical Map-12
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 012
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings

- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-13

**Project Name:**

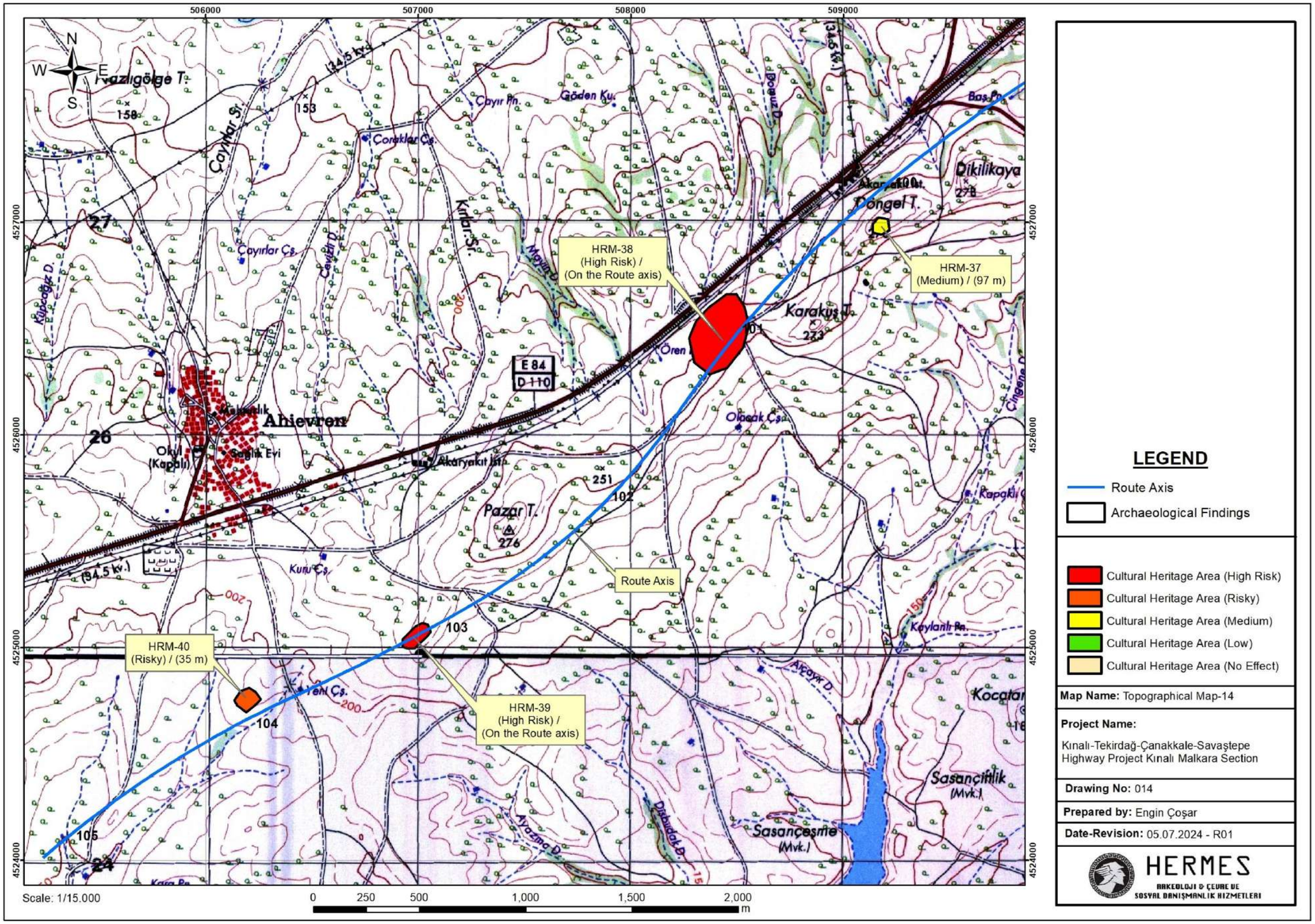
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

**Drawing No:** 013

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Topographical Map-14

**Project Name:**

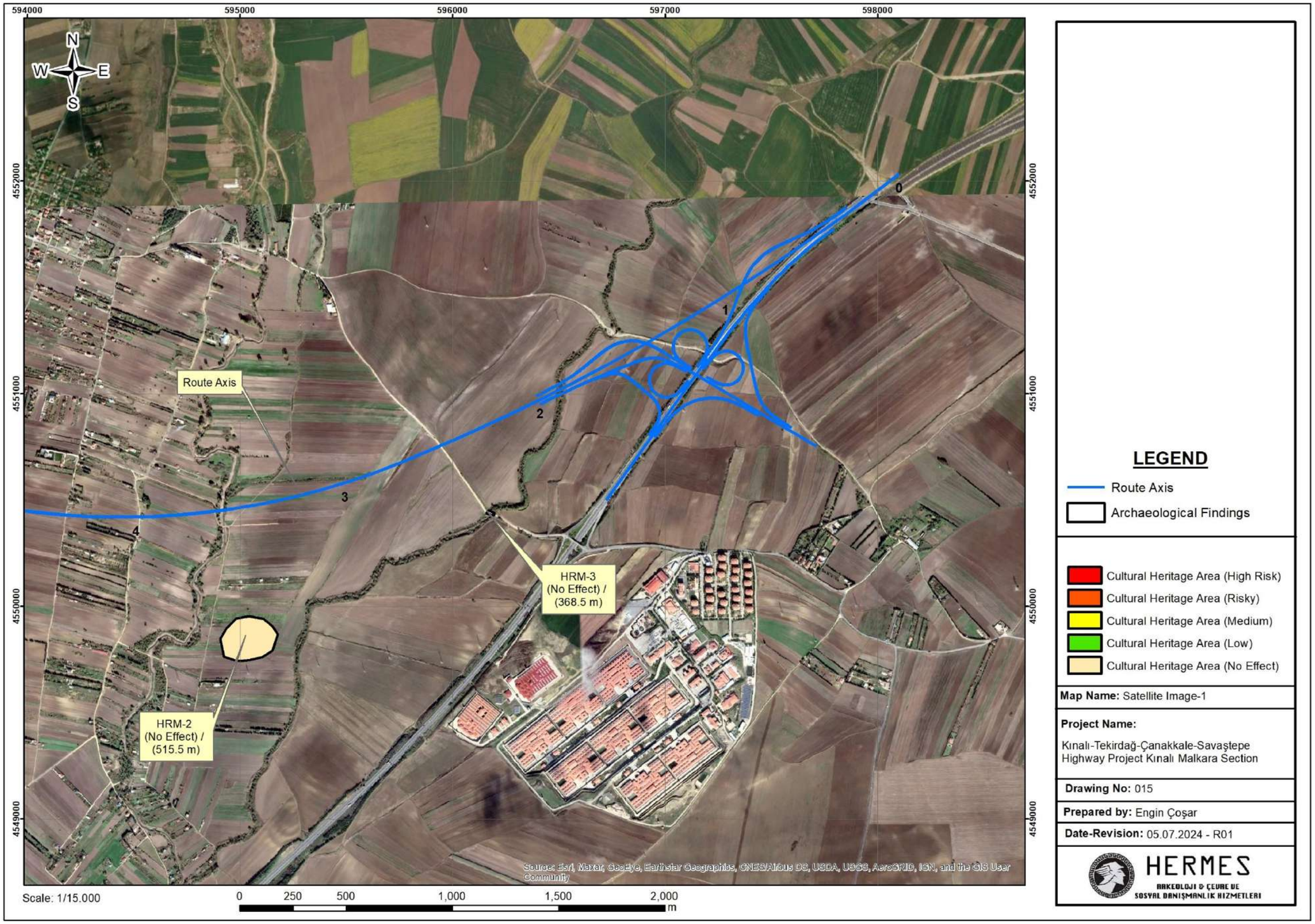
Kınalı-Tekirdağ-Çanakkale-Savaştepe
Highway Project Kınalı Malkara Section

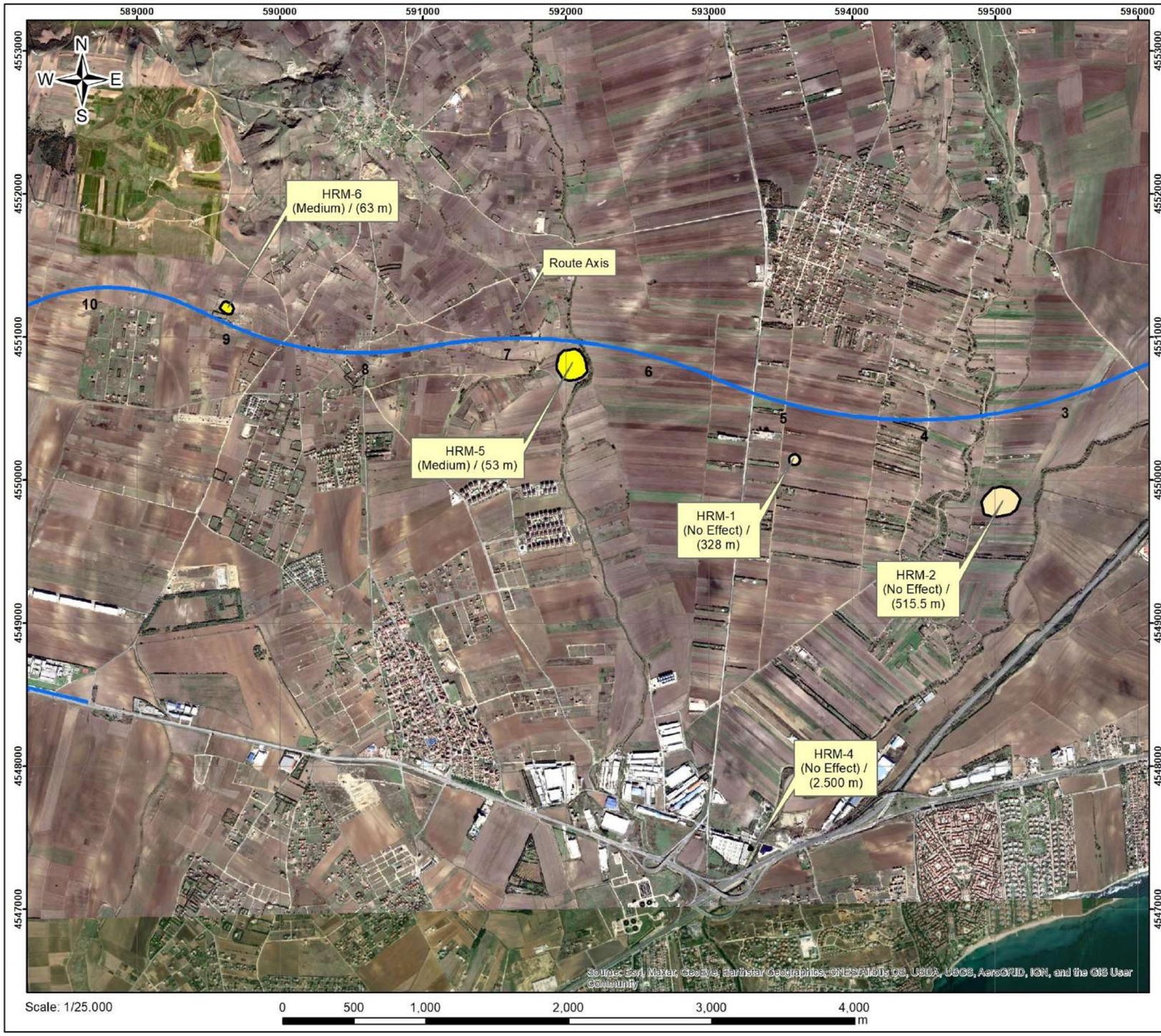
**Drawing No:** 014

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


594000
595000
596000
597000
598000
4552000
4551000
4550000
4549000
N
W
E
S
Route Axis
0
1
2
3
4
HRM-3
(No Effect) /
(368.5 m)
HRM-2
(No Effect) /
(515.5 m)
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Scale: 1/15.000
0 250 500 1,000 1,500 2,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-1
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 015
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Satellite Image-2

**Project Name:**

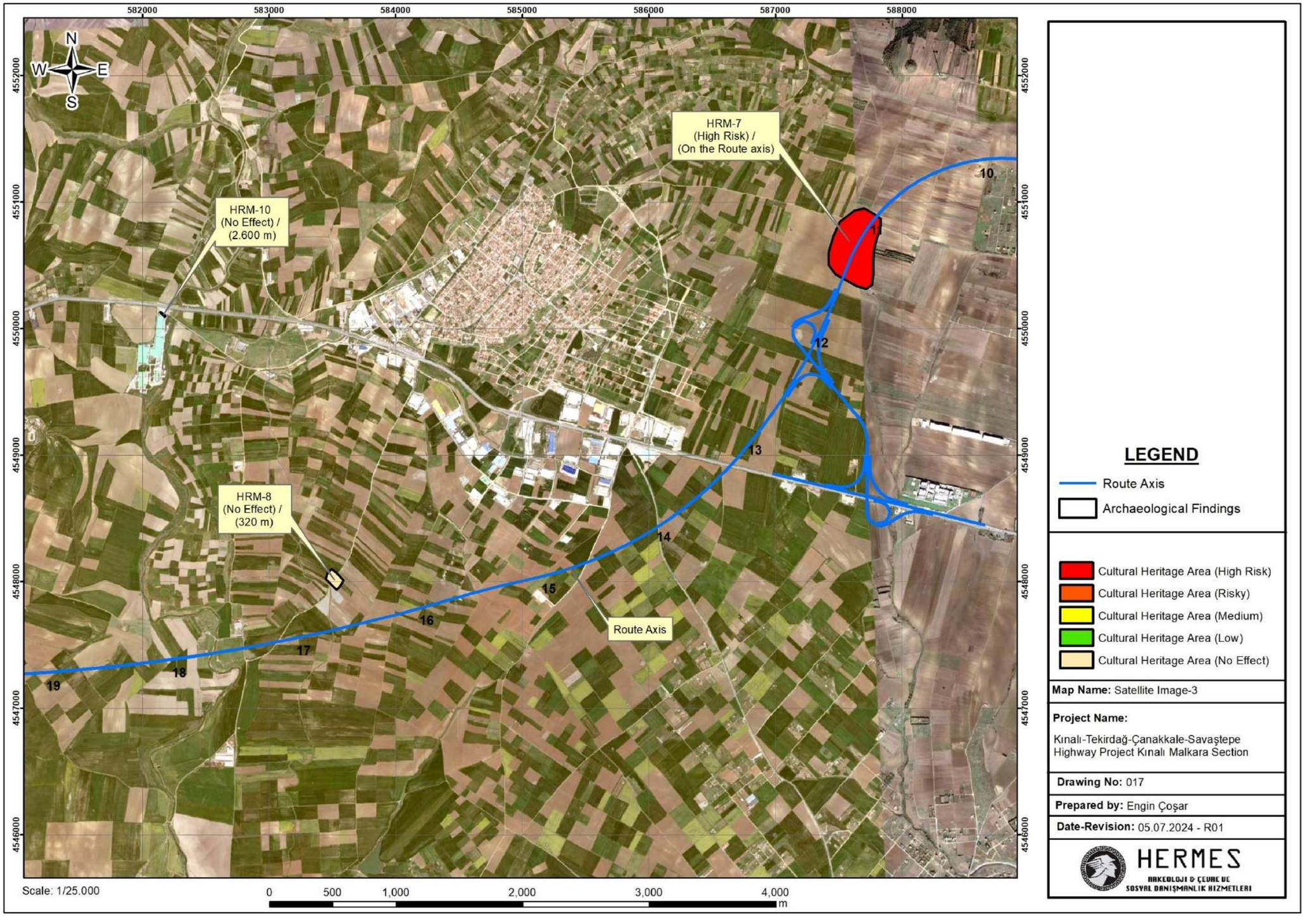
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

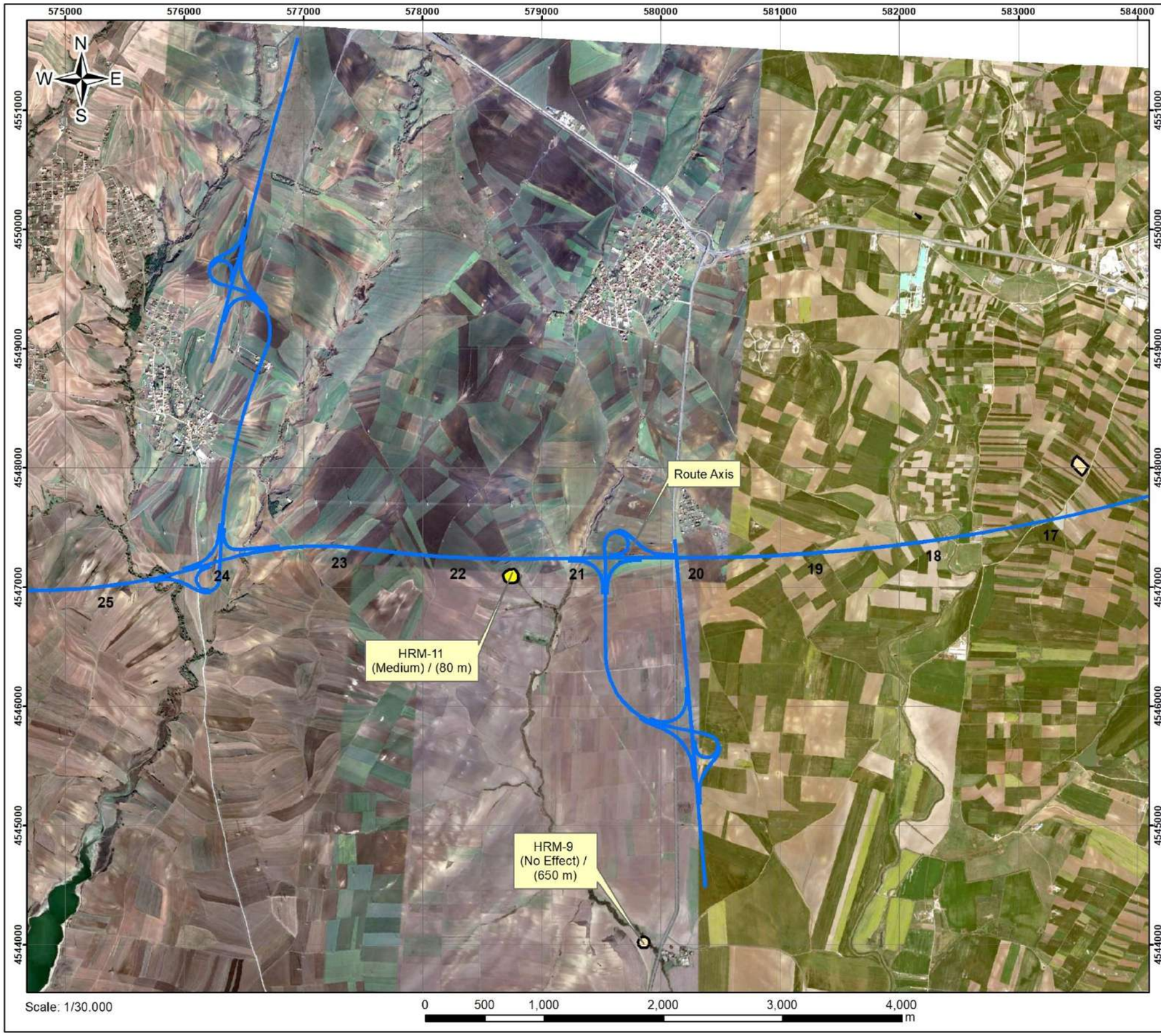
**Drawing No:** 016

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


582000
583000
584000
585000
586000
587000
588000
4552000
4551000
4550000
4549000
4548000
4547000
4546000
N
W
E
S
HRM-7
(High Risk) /
(On the Route axis)
HRM-10
(No Effect) /
(2.600 m)
HRM-8
(No Effect) /
(320 m)
Route Axis
10
11
12
13
14
15
16
17
18
19
Scale: 1/25.000
0
500
1,000
2,000
3,000
4,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-3
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 017
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Satellite Image-4

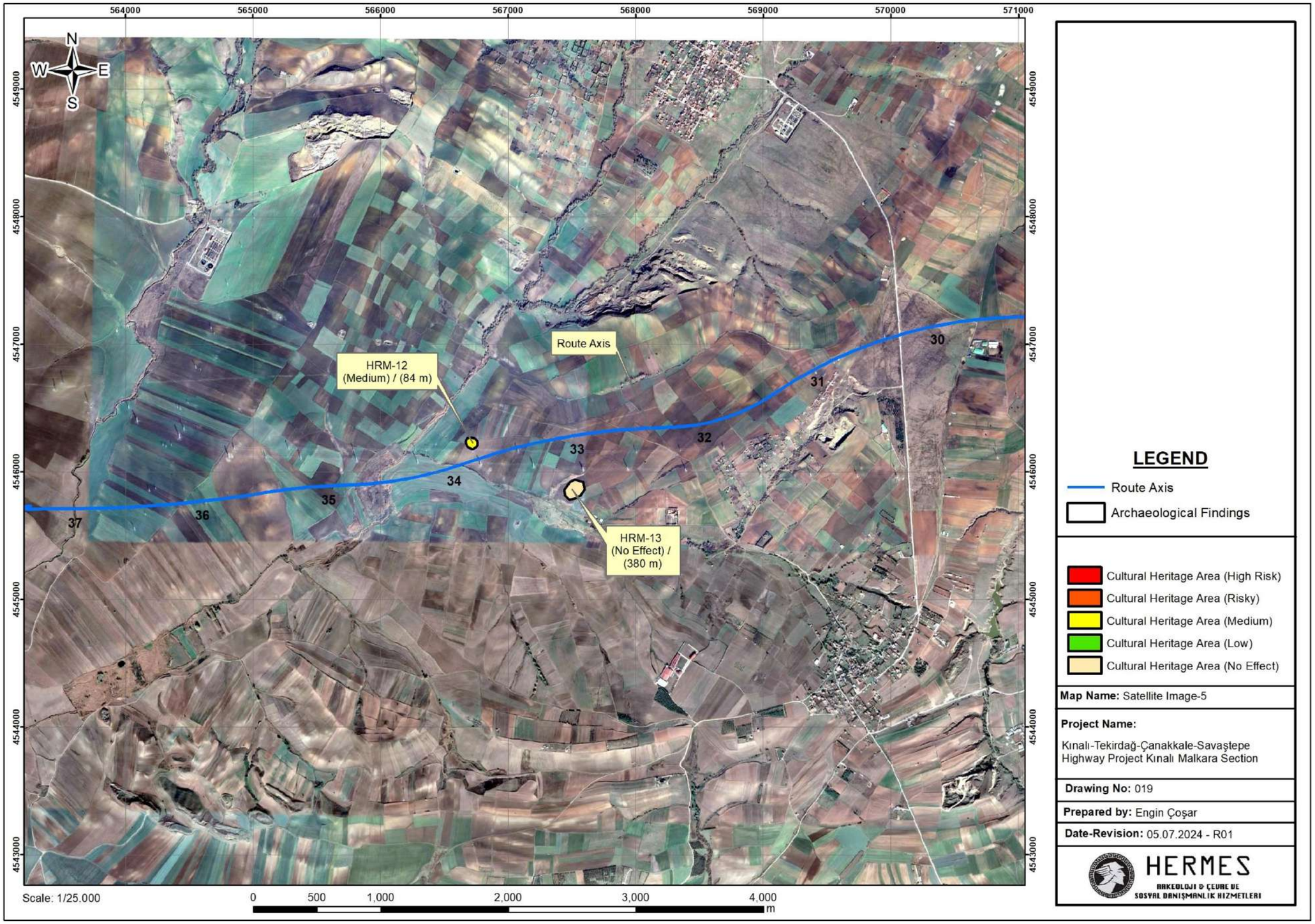
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

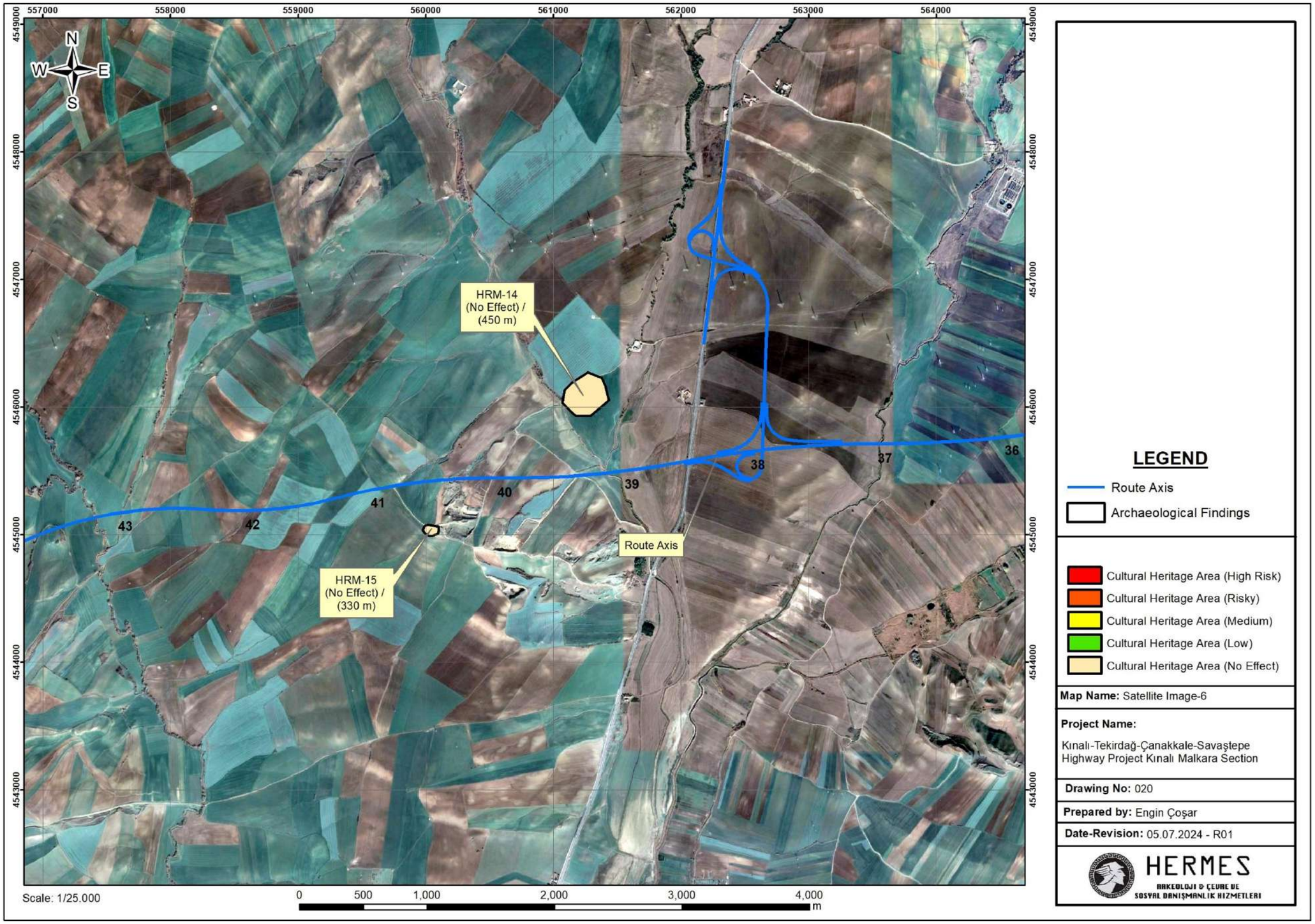
**Drawing No:** 018

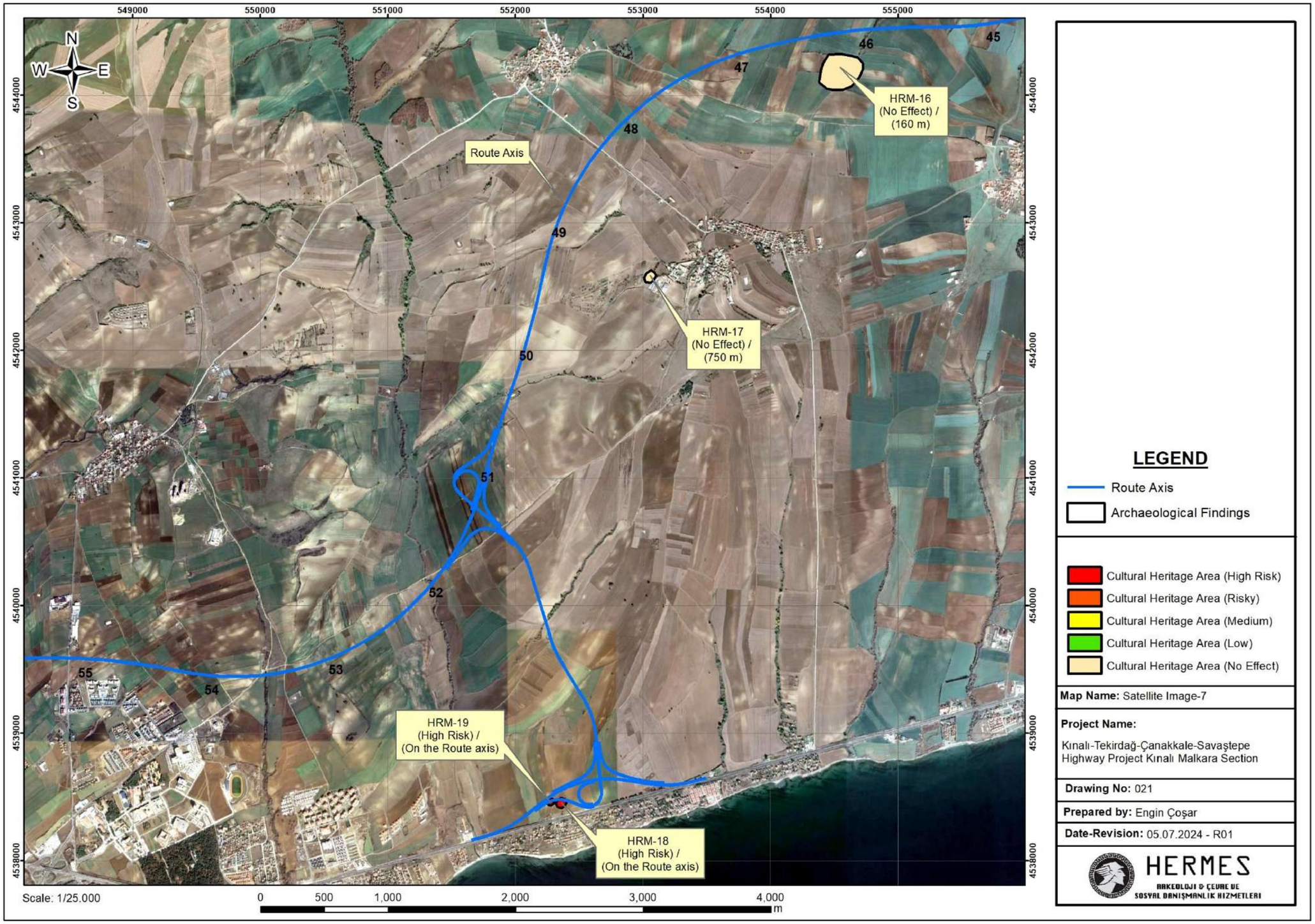
**Prepared by:** Engin Çoşar

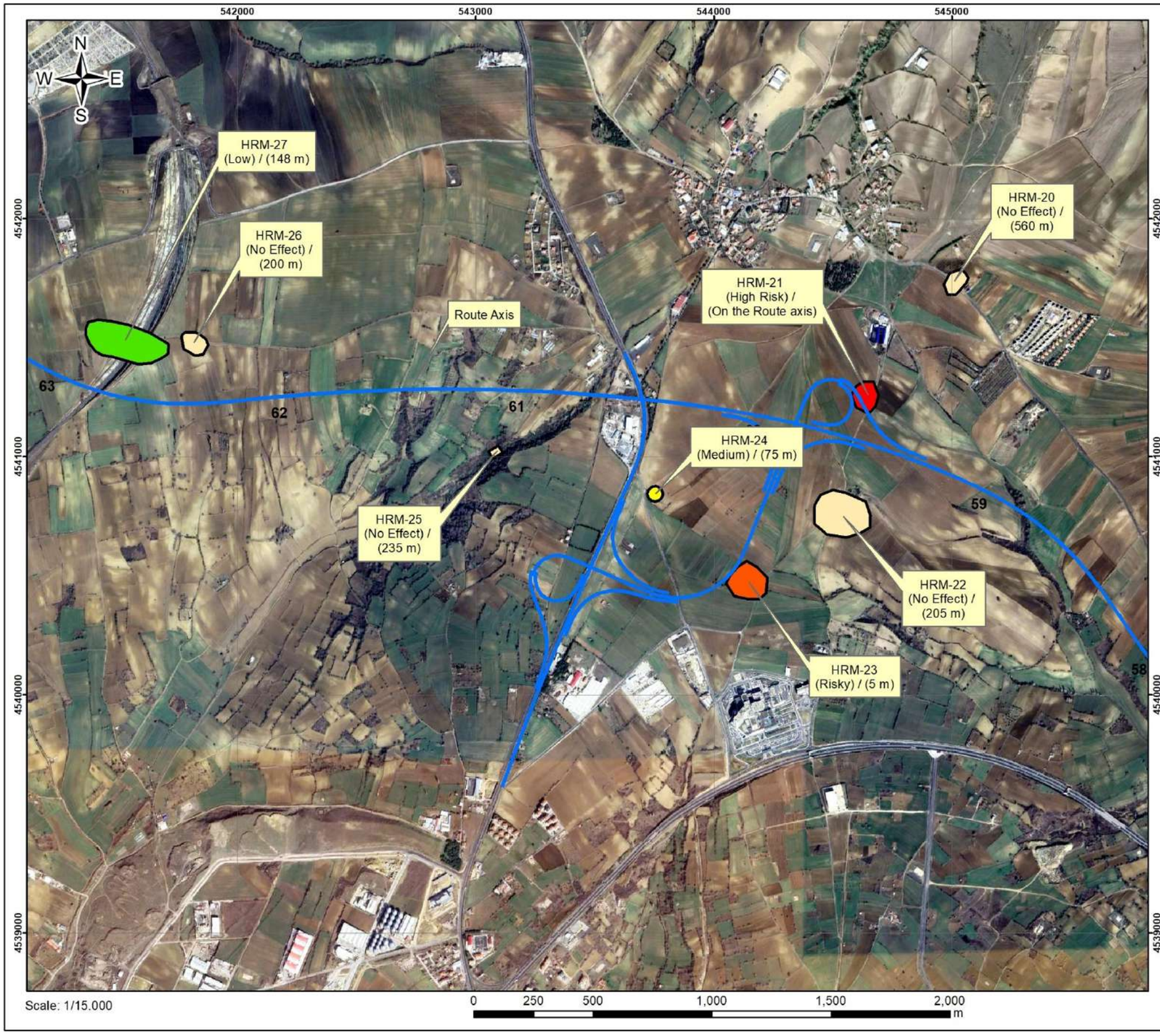
**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


564000
565000
566000
567000
568000
569000
570000
571000
4549000
4548000
4547000
4546000
4545000
4544000
4543000
N
W
E
S
Route Axis
HRM-12
(Medium) / (84 m)
HRM-13
(No Effect) /
(380 m)
30
31
32
33
34
35
36
37
Scale: 1/25.000
0
500
1,000
2,000
3,000
4,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-5
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe
Highway Project Kınalı Malkara Section
Drawing No: 019
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


557000
558000
559000
560000
561000
562000
563000
564000
4549000
4548000
4547000
4546000
4545000
4544000
4543000
N
W
E
S
HRM-14
(No Effect) /
(450 m)
HRM-15
(No Effect) /
(330 m)
Route Axis
36
37
38
39
40
41
42
43
Scale: 1/25.000
0
500
1,000
2,000
3,000
4,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-6
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 020
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


549000
550000
551000
552000
553000
554000
555000
4544000
4543000
4542000
4541000
4540000
4539000
4538000
N
W
E
S
45
46
47
48
49
50
51
52
53
54
55
Route Axis
HRM-16
(No Effect) /
(160 m)
HRM-17
(No Effect) /
(750 m)
HRM-19
(High Risk) /
(On the Route axis)
HRM-18
(High Risk) /
(On the Route axis)
Scale: 1/25.000
0
500
1,000
2,000
3,000
4,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-7
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe
Highway Project Kınalı Malkara Section
Drawing No: 021
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Route Axis
- Archaeological Findings

- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Satellite Image-8

**Project Name:**

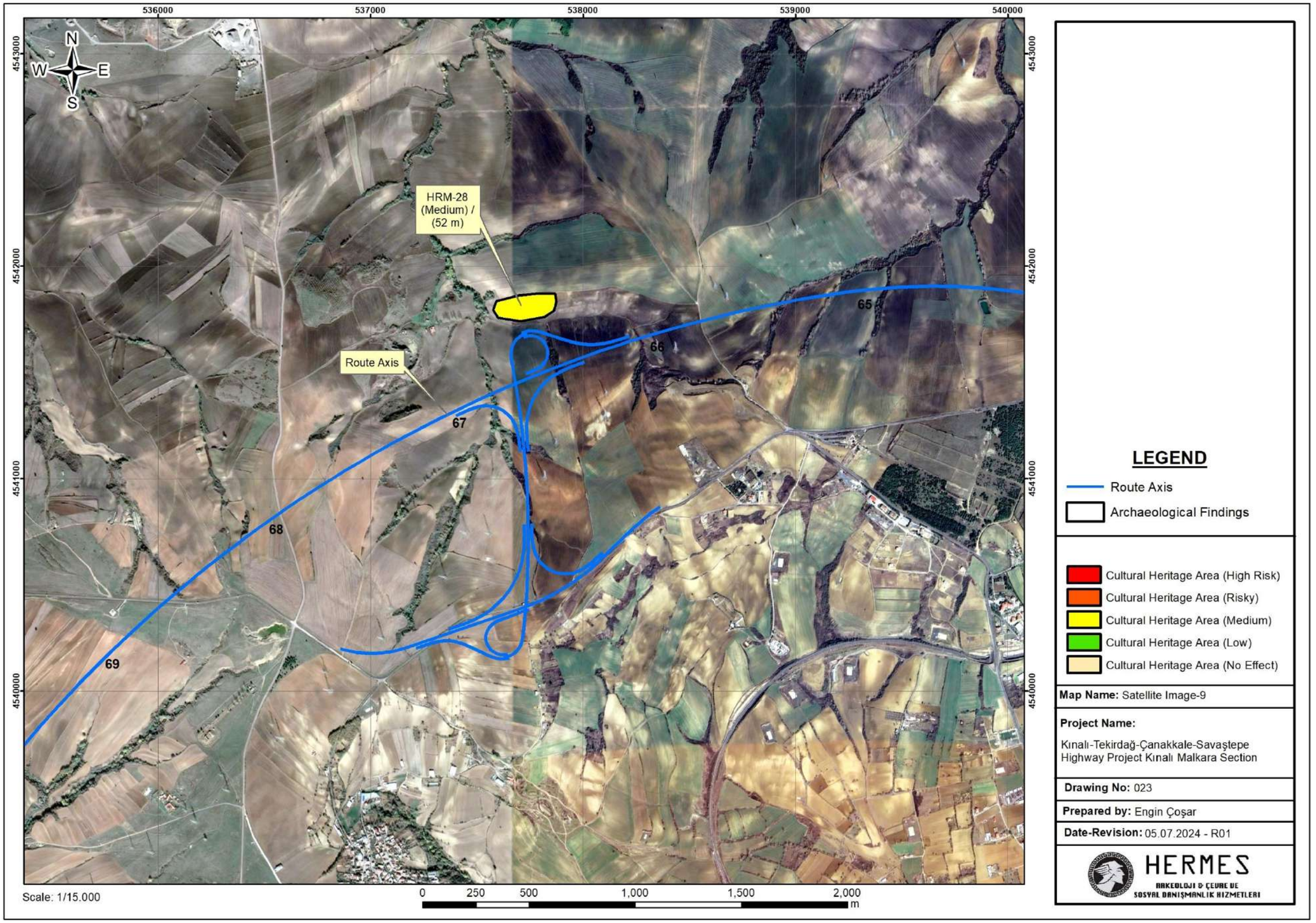
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

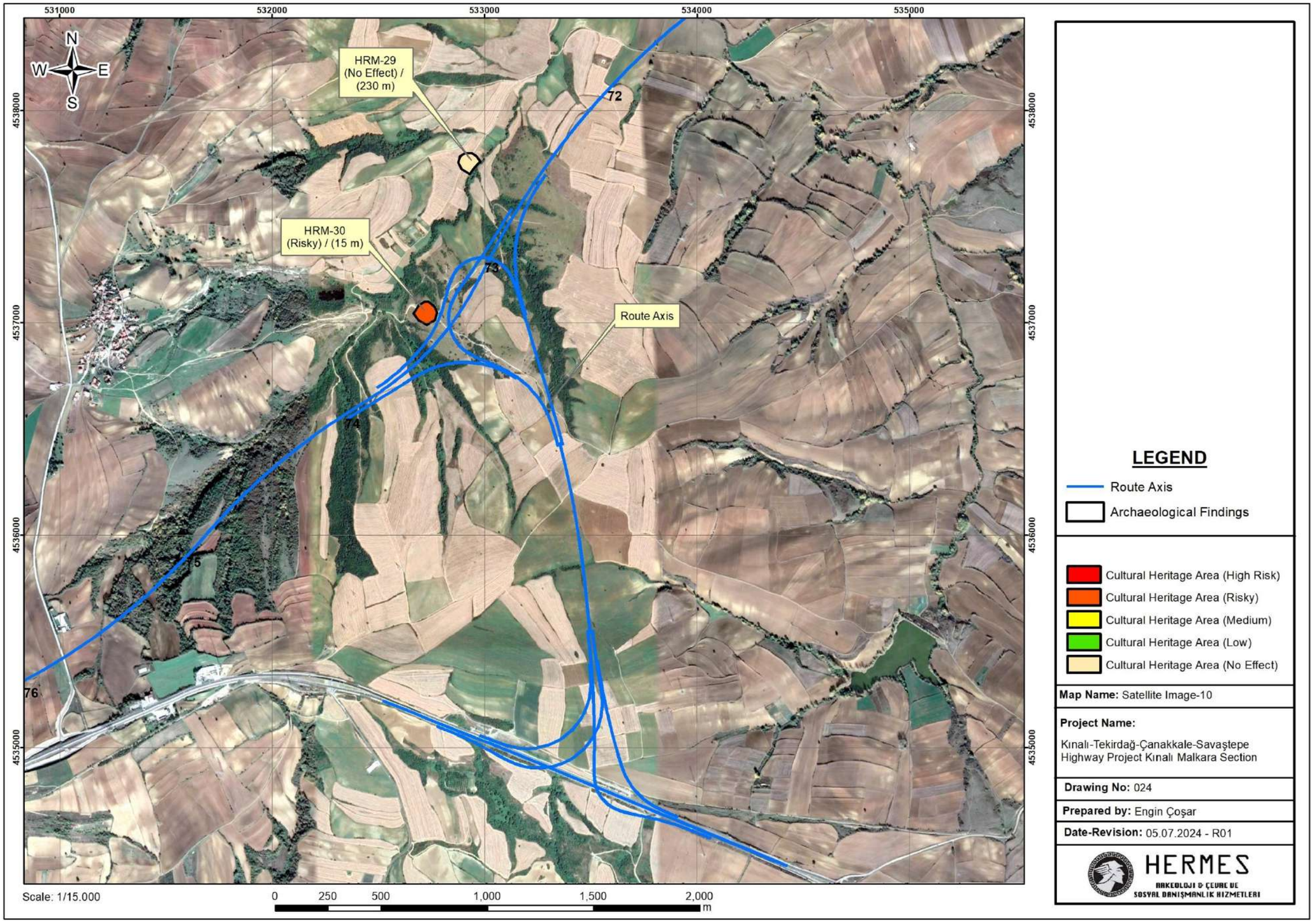
**Drawing No:** 022

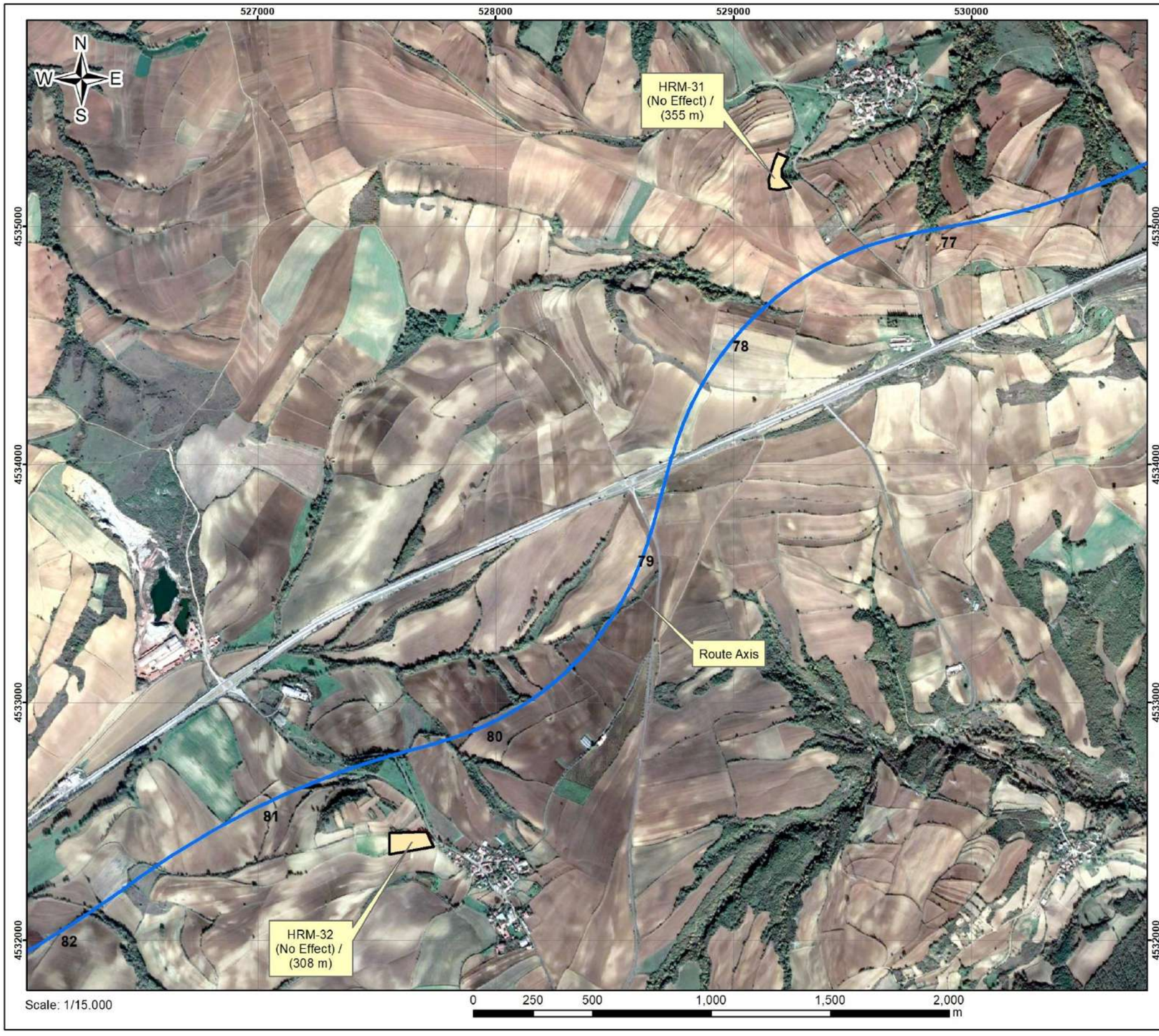
**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


536000
537000
538000
539000
540000
4543000
4542000
4541000
4540000
N
W
E
S
HRM-28
(Medium) /
(52 m)
Route Axis
65
66
67
68
69
Scale: 1/15.000
0
250
500
1,000
1,500
2,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-9
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe
Highway Project Kınalı Malkara Section
Drawing No: 023
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


531000
532000
533000
534000
535000
4538000
4537000
4536000
4535000
N
W
E
S
HRM-29
(No Effect) /
(230 m)
HRM-30
(Risky) / (15 m)
Route Axis
72
73
74
75
76
Scale: 1/15.000
0
250
500
1,000
1,500
2,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-10
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe
Highway Project Kınalı Malkara Section
Drawing No: 024
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings

- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Satellite Image-11

**Project Name:**

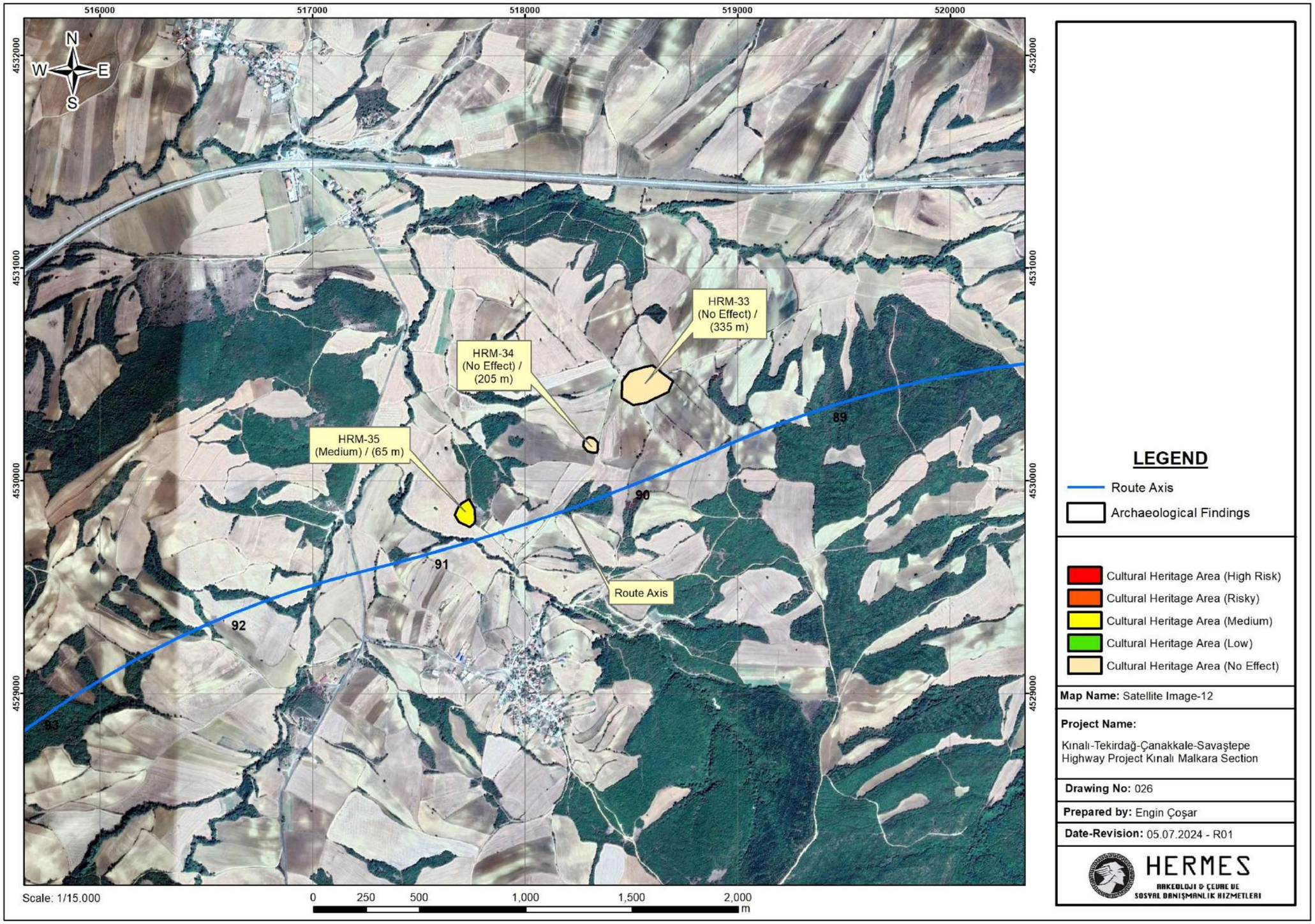
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

**Drawing No:** 025

**Prepared by:** Engin Çoşar

**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


516000
517000
518000
519000
520000
4532000
4531000
4530000
4529000
N
W
E
S
HRM-33
(No Effect) /
(335 m)
HRM-34
(No Effect) /
(205 m)
HRM-35
(Medium) / (65 m)
89
90
91
92
93
Route Axis
Scale: 1/15.000
0
250
500
1,000
1,500
2,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-12
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe
Highway Project Kınalı Malkara Section
Drawing No: 026
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Route Axis
- Archaeological Findings
- Cultural Heritage Area (High Risk)
- Cultural Heritage Area (Risky)
- Cultural Heritage Area (Medium)
- Cultural Heritage Area (Low)
- Cultural Heritage Area (No Effect)

**Map Name:** Satellite Image-13

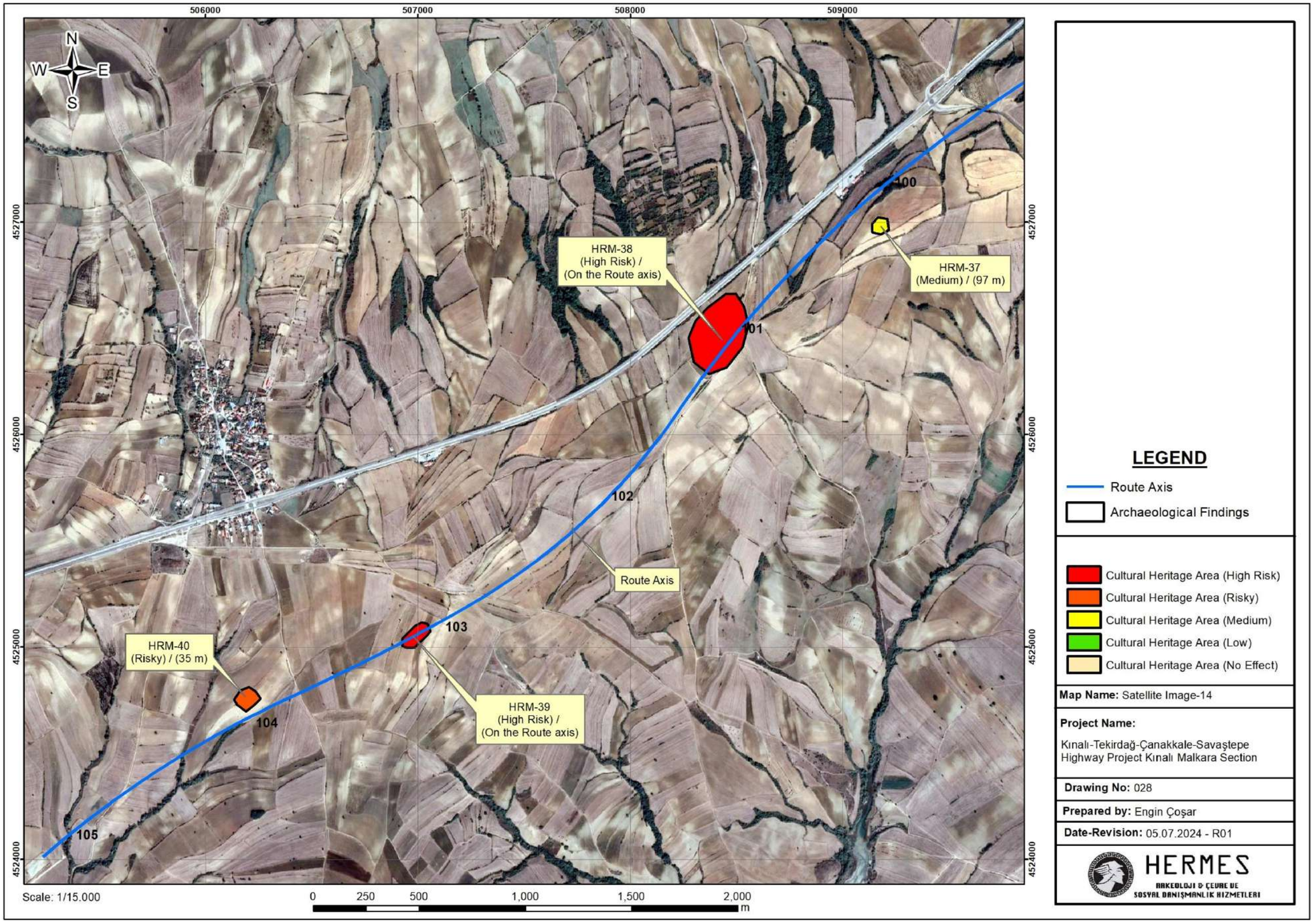
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section

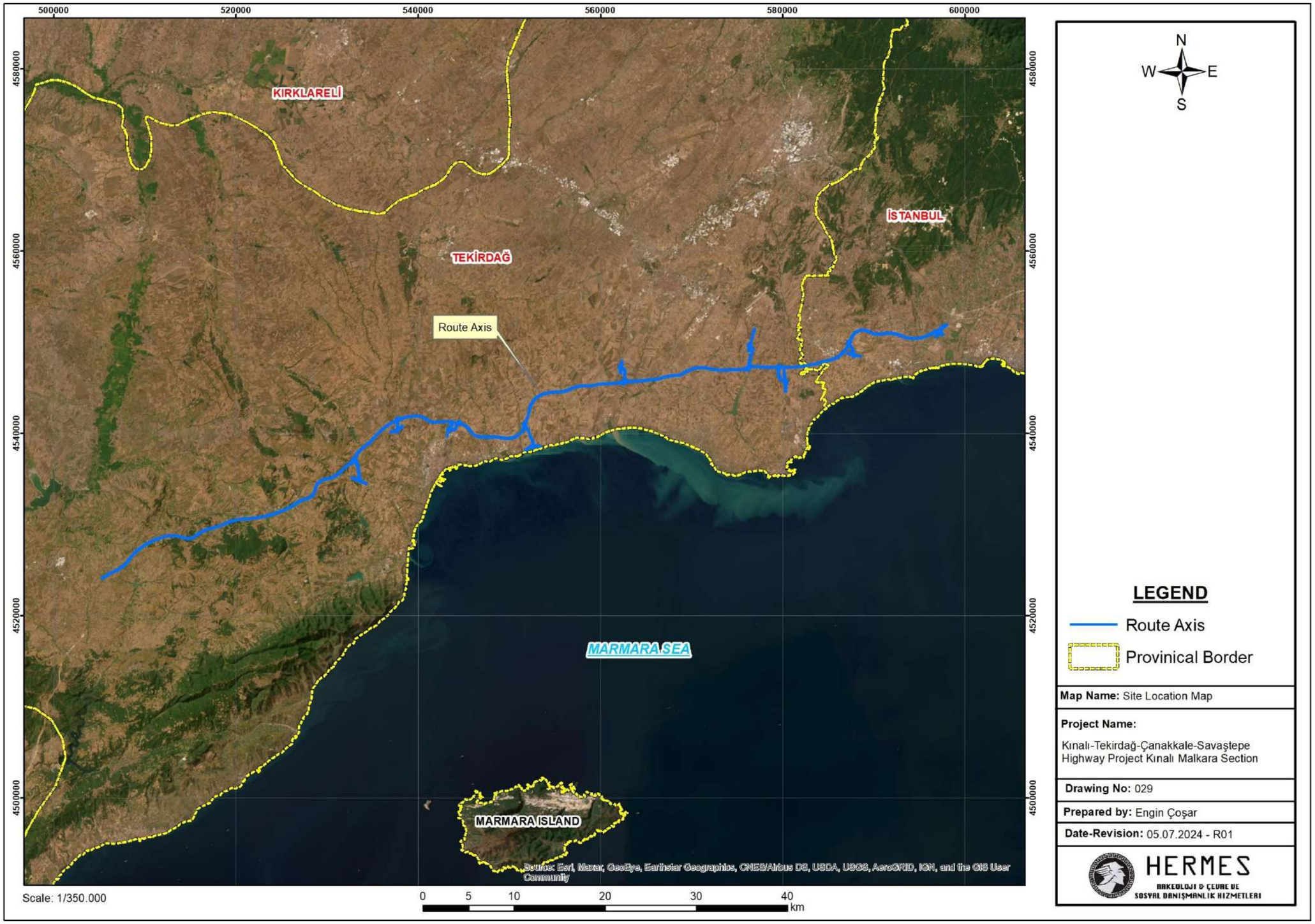
**Drawing No:** 027

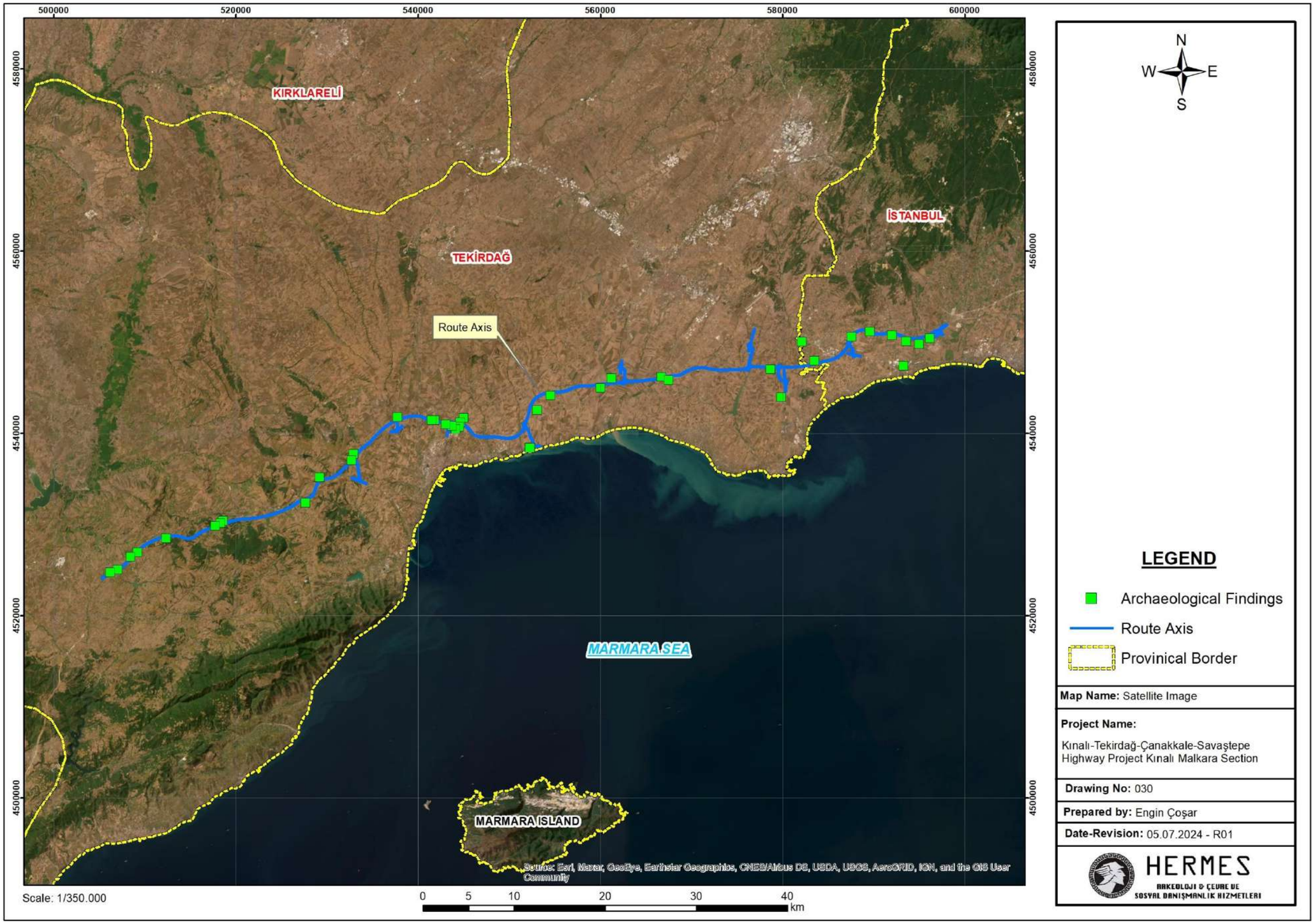
**Prepared by:** Engin Çoşar

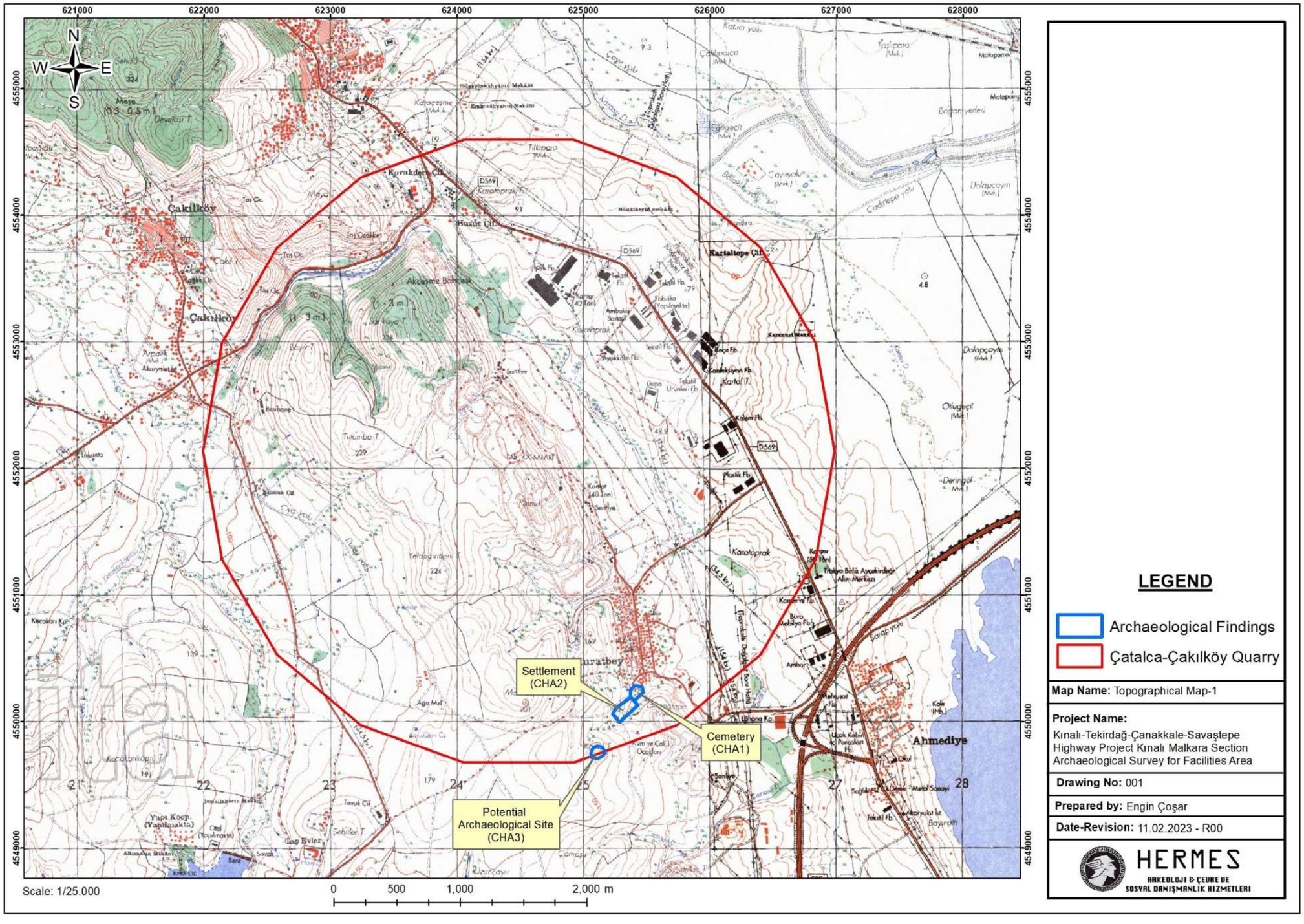
**Date-Revision:** 05.07.2024 - R01

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


506000
507000
508000
509000
4527000
4526000
4525000
4524000
N
W
E
S
HRM-38
(High Risk) /
(On the Route axis)
HRM-37
(Medium) / (97 m)
HRM-40
(Risky) / (35 m)
HRM-39
(High Risk) /
(On the Route axis)
Route Axis
100
101
102
103
104
105
Scale: 1/15.000
0
250
500
1,000
1,500
2,000
m
LEGEND
Route Axis
Archaeological Findings
Cultural Heritage Area (High Risk)
Cultural Heritage Area (Risky)
Cultural Heritage Area (Medium)
Cultural Heritage Area (Low)
Cultural Heritage Area (No Effect)
Map Name: Satellite Image-14
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 028
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


500000
520000
540000
560000
580000
600000
4580000
4560000
4540000
4520000
4500000
KIRKLARELİ
TEKİRDAĞ
İSTANBUL
Route Axis
MARMARA SEA
MARMARA ISLAND
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Scale: 1/350.000
0 5 10 20 30 40
km
N
W
E
S
LEGEND
Route Axis
Provinical Border
Map Name: Site Location Map
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 029
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


500000
520000
540000
560000
580000
600000
4580000
4560000
4540000
4520000
4500000
KIRKLARELİ
TEKİRDAĞ
İSTANBUL
Route Axis
MARMARA SEA
MARMARA ISLAND
Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Scale: 1/350.000
0 5 10 20 30 40
km
N
W
E
S
LEGEND
Archaeological Findings
Route Axis
Provinical Border
Map Name: Satellite Image
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section
Drawing No: 030
Prepared by: Engin Çoşar
Date-Revision: 05.07.2024 - R01
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Archaeological Findings
- Çatalca-Çakılköy Quarry

**Map Name:** Topographical Map-1

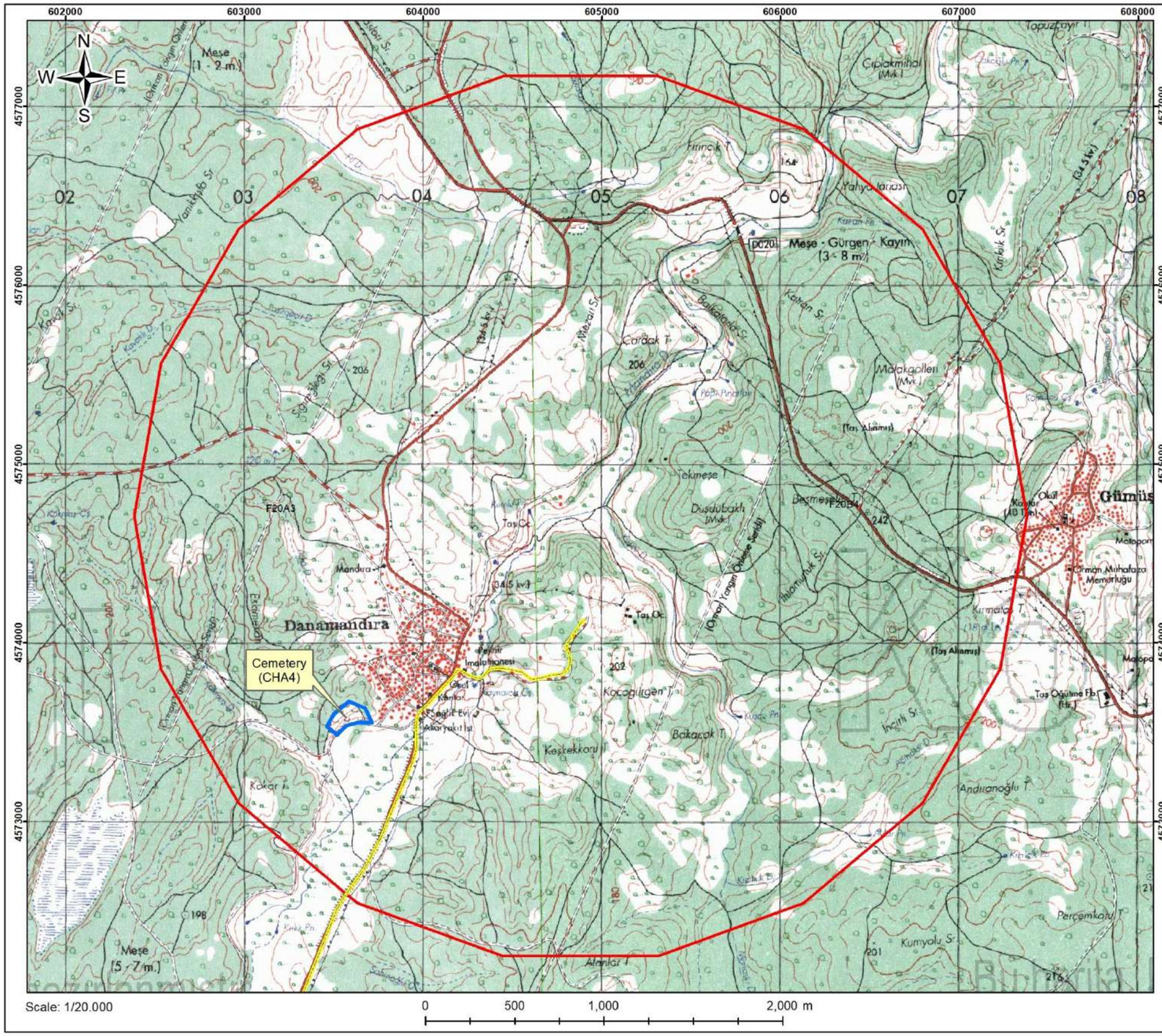
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 001

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
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SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Access Road
- Archaeological Findings
- Danamandıra Limestone Quarry

**Map Name:** Topographical Map-2

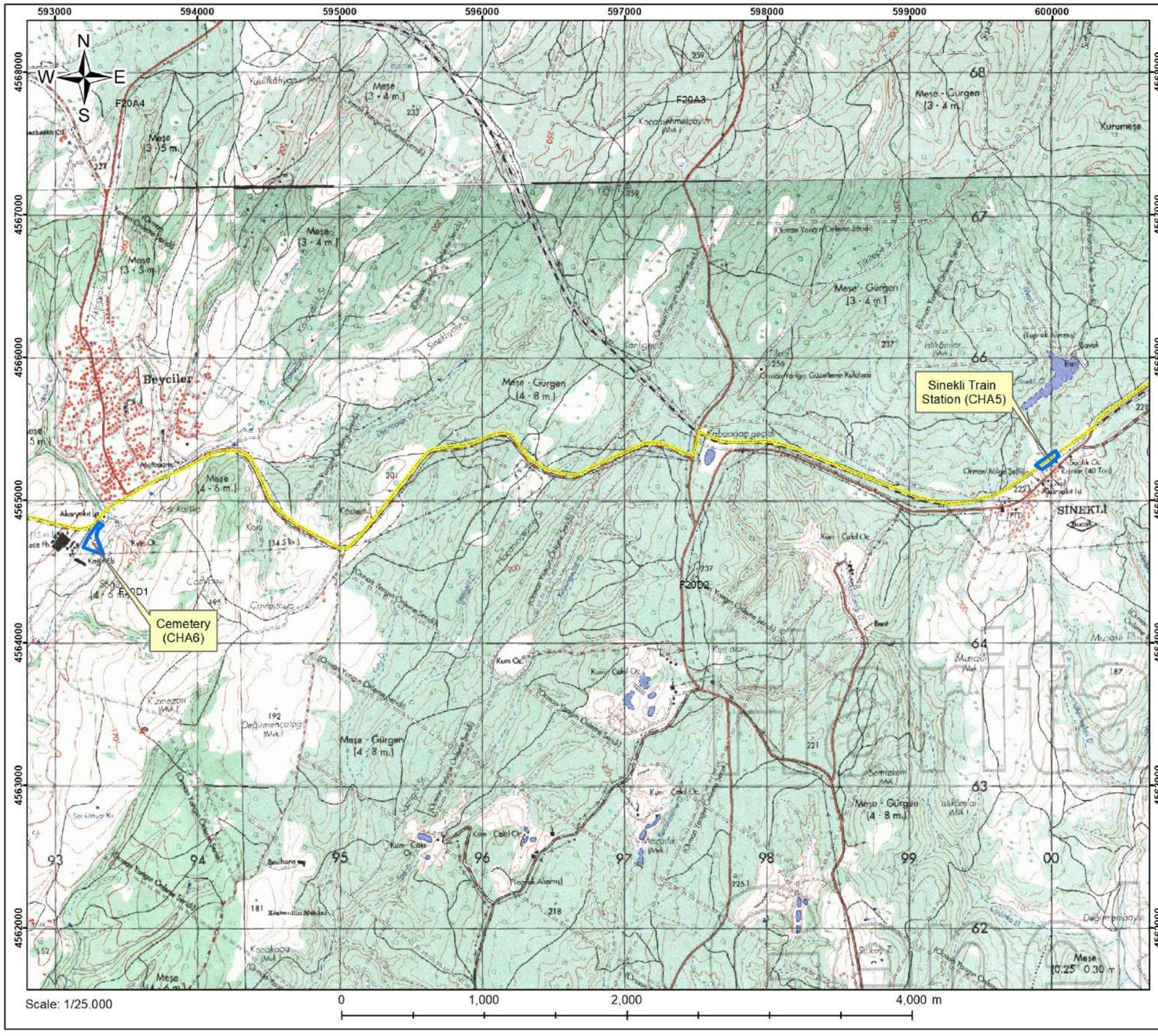
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 002

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

Access Road

Archaeological Findings

**Map Name:** Topographical Map-3

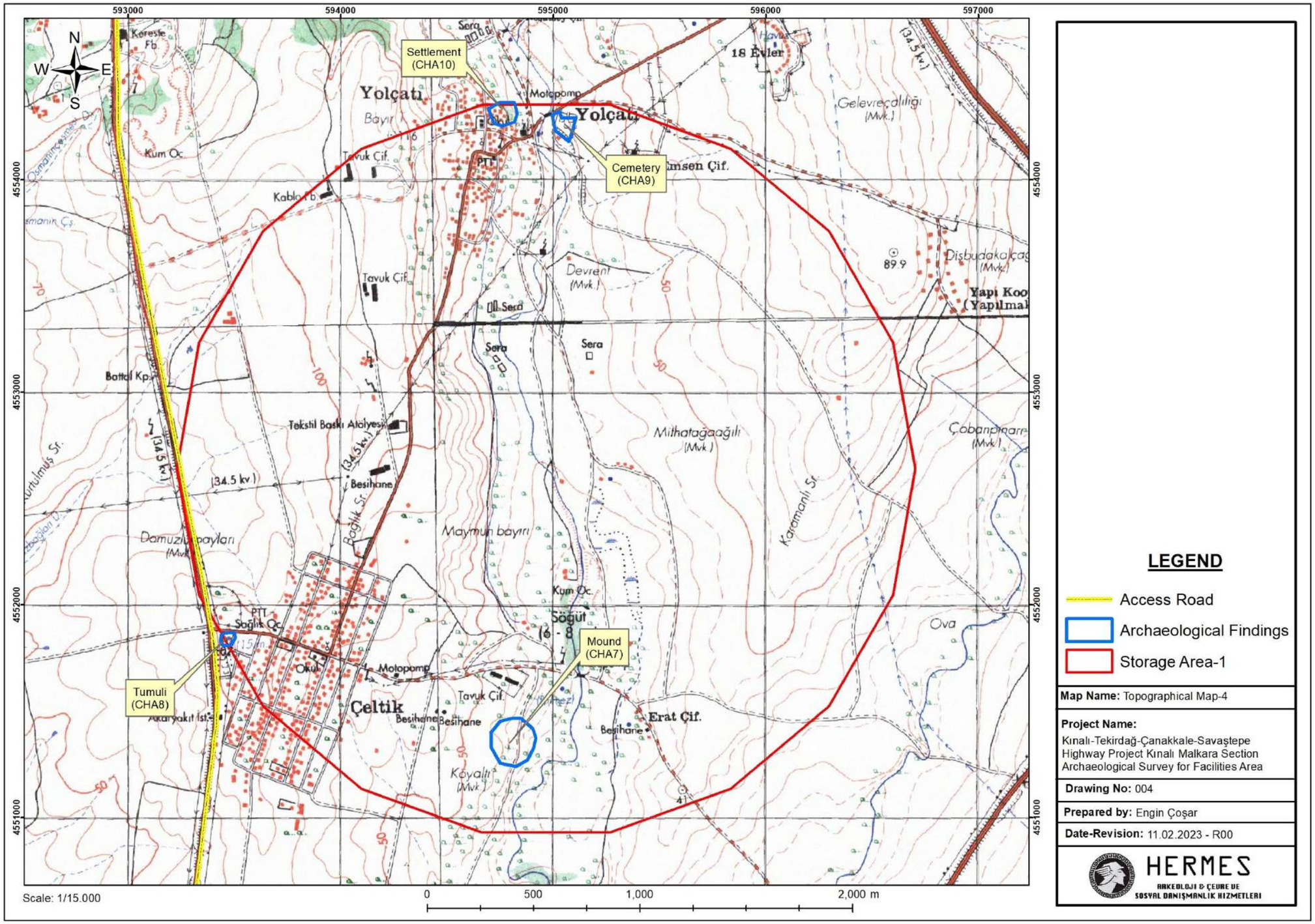
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 003

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Access Road
- Archaeological Findings
- Storage Area-1

**Map Name:** Topographical Map-4

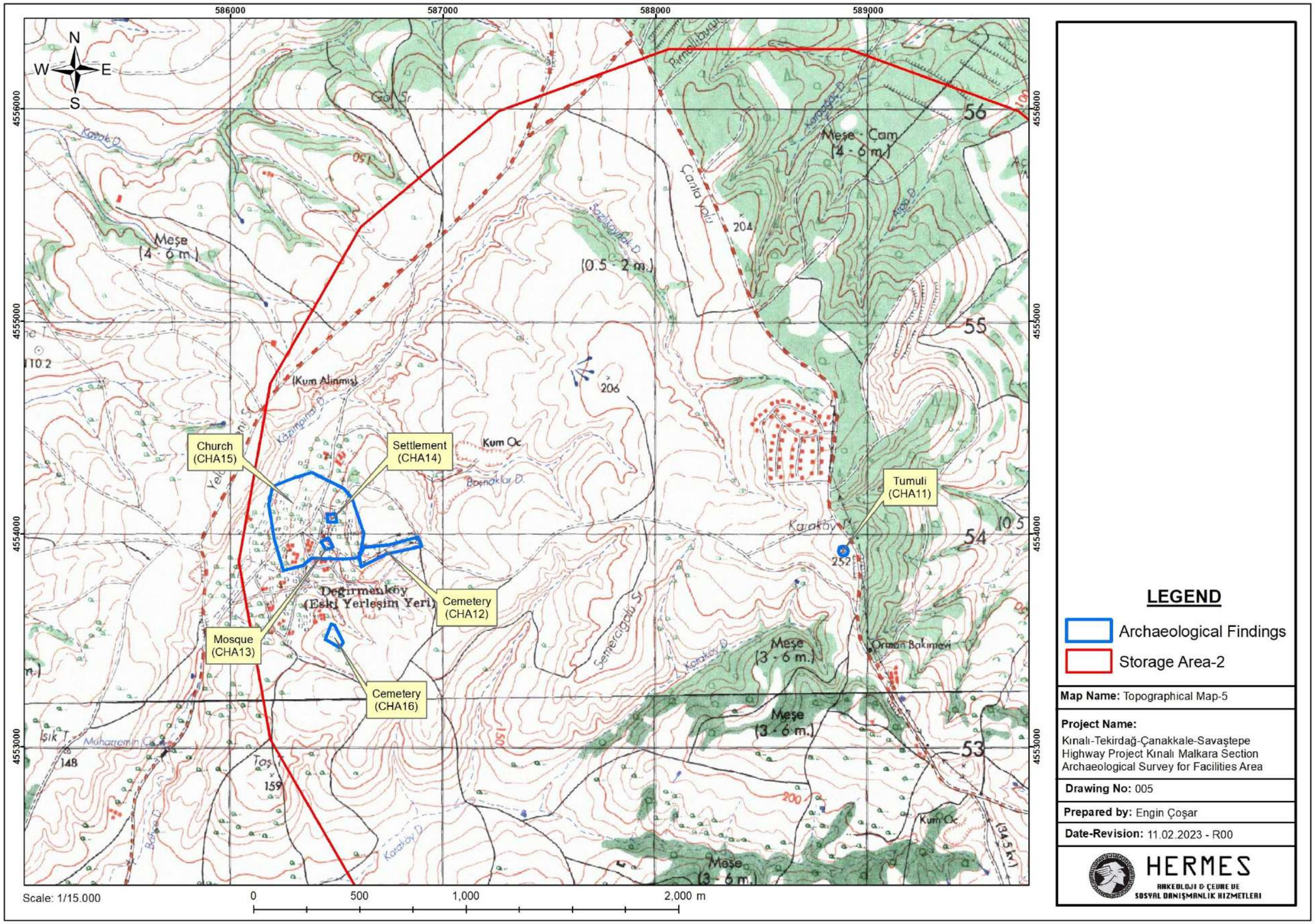
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 004

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
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**LEGEND**

Archaeological Findings

Storage Area-2

**Map Name:** Topographical Map-5

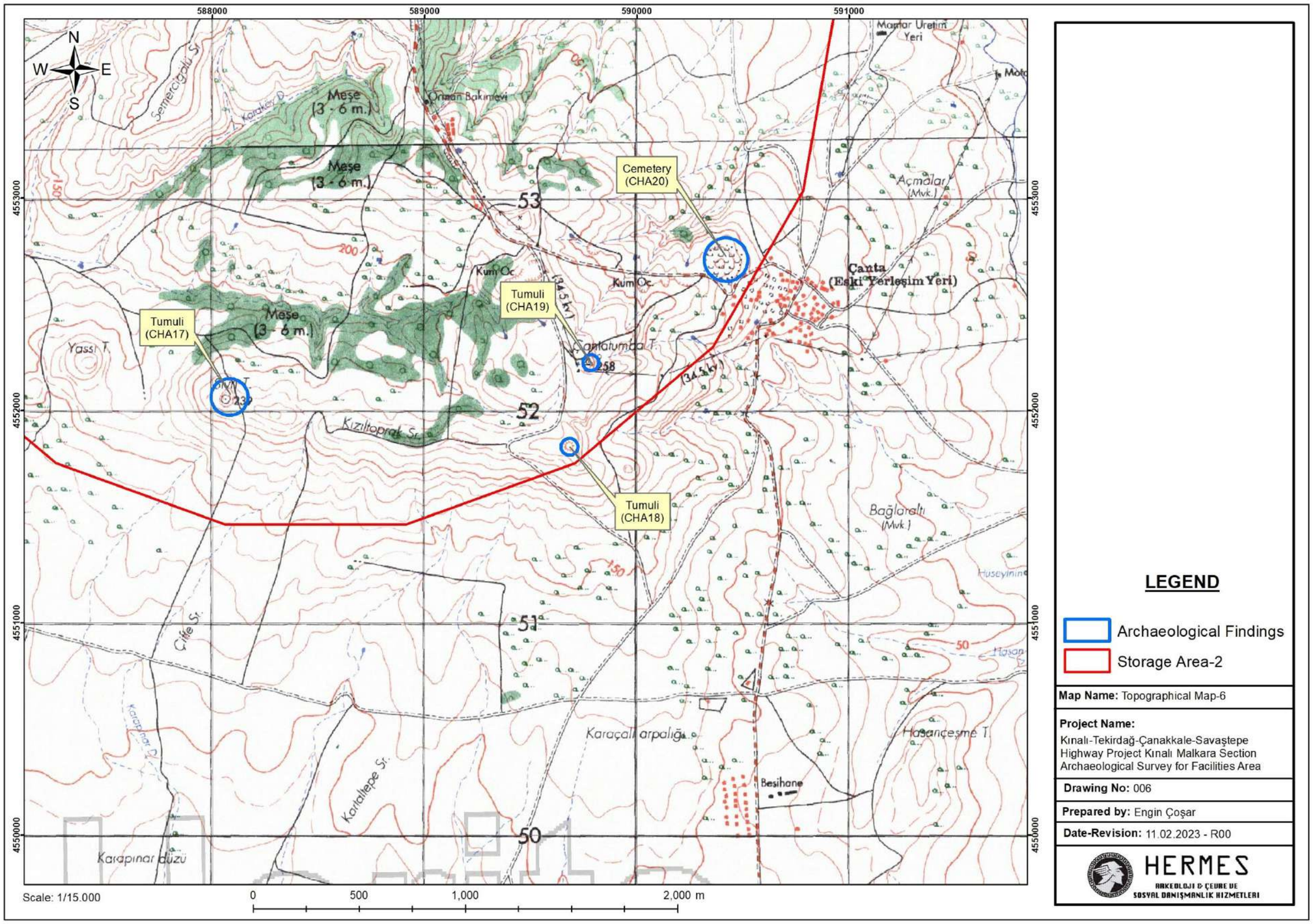
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 005

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Archaeological Findings
- Storage Area-2

**Map Name:** Topographical Map-6

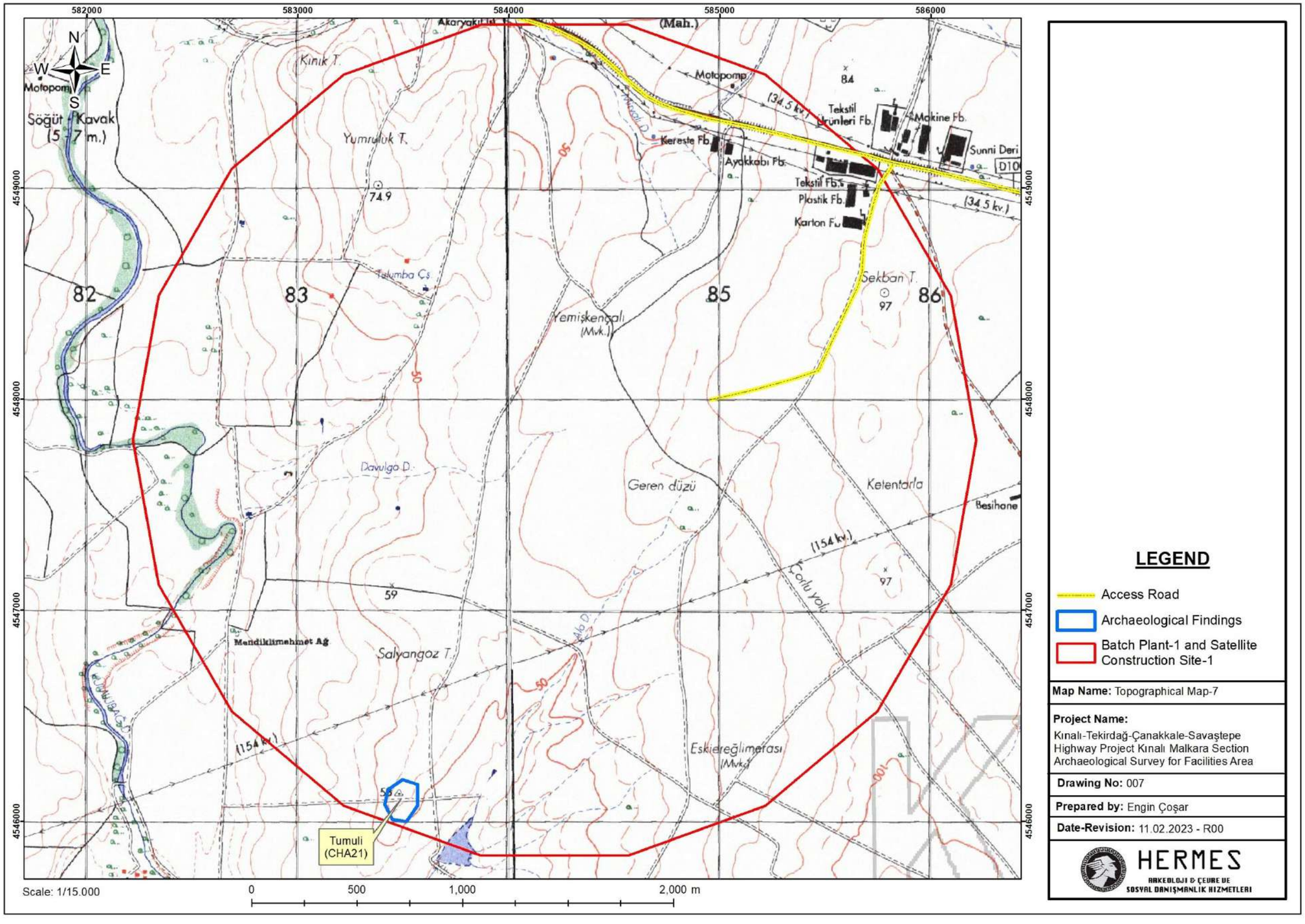
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 006

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
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SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Access Road
- Archaeological Findings
- Batch Plant-1 and Satellite Construction Site-1

**Map Name:** Topographical Map-7

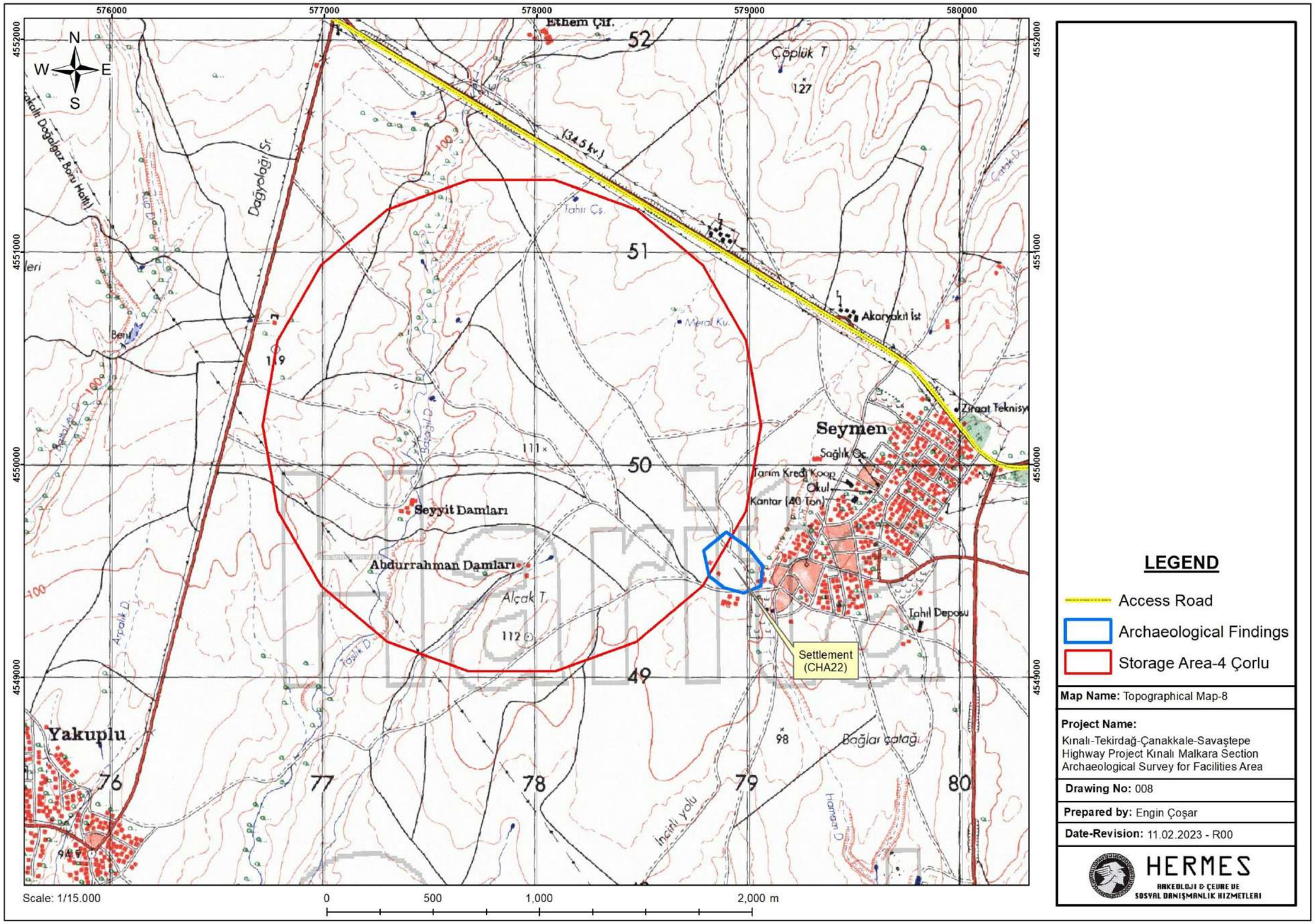
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

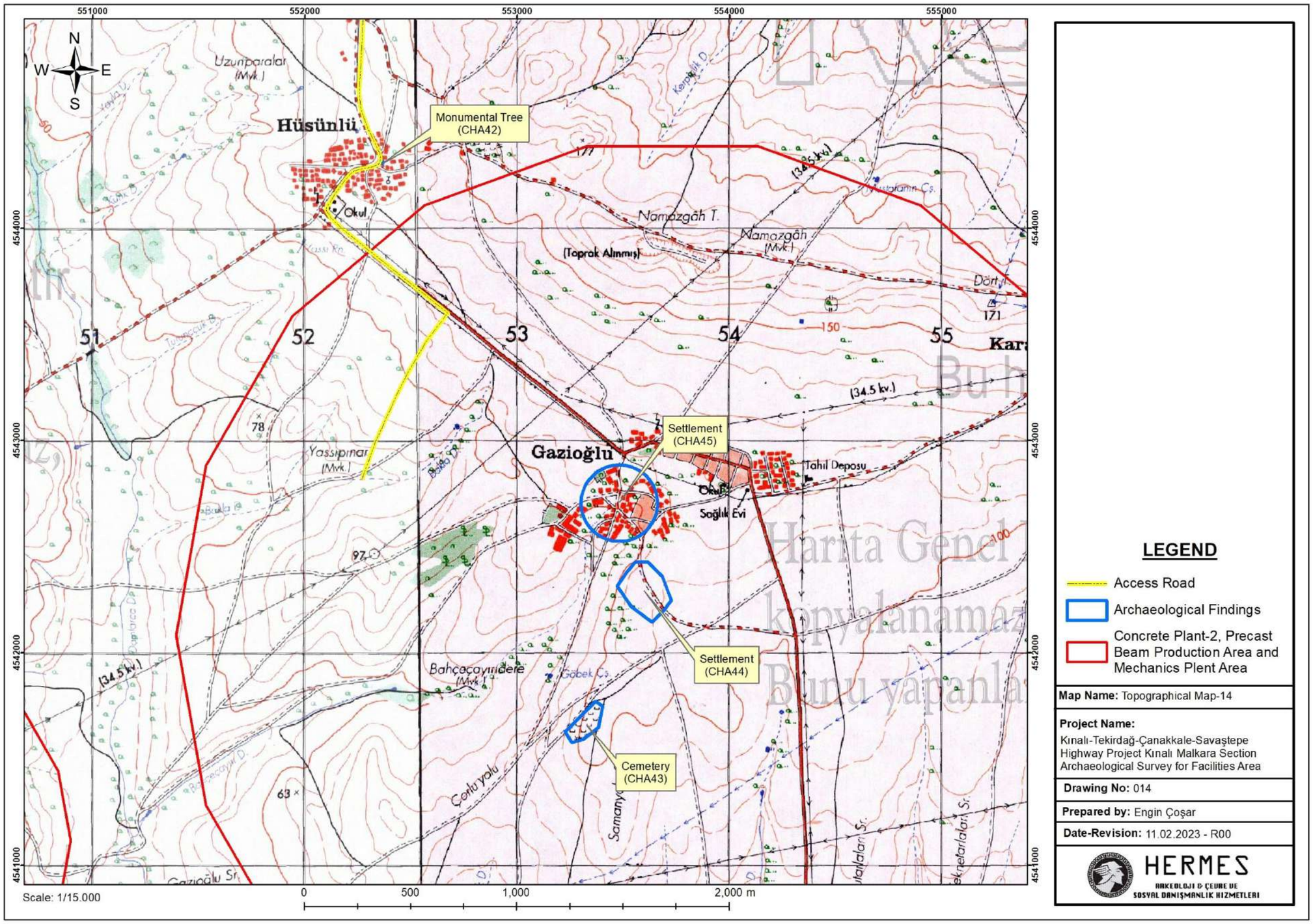
**Drawing No:** 007

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


576000
577000
578000
579000
580000
4552000
4551000
4550000
4549000
N
W
E
S
Ethem Çif.
52
Çöplük T
127
(34.5 kv.)
Dağyolağı Sr.
Tahıl Çş.
51
Meral Ku.
Akaryakıt İst
Ziraat Teknisyı
Seymen
Sağlık Oc.
Tarım Kredi Koop.
Okul
Kantar (40 Ton)
50
Seyyit Damları
Abdurrahman Damları
Alçak T.
112
İahıl Deposu
Settlement
(CHA22)
49
Yakuplu
98
Bağları çatağı
76
77
78
79
80
İncirli yolu
Scale: 1/15.000
0
500
1,000
2,000 m
LEGEND
Access Road
Archaeological Findings
Storage Area-4 Çorlu
Map Name: Topographical Map-8
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area
Drawing No: 008
Prepared by: Engin Çoşar
Date-Revision: 11.02.2023 - R00
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Access Road
- Archaeological Findings
- Concrete Plant-2, Precast Beam Production Area and Mechanics Plent Area

**Map Name:** Topographical Map-14

**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 014

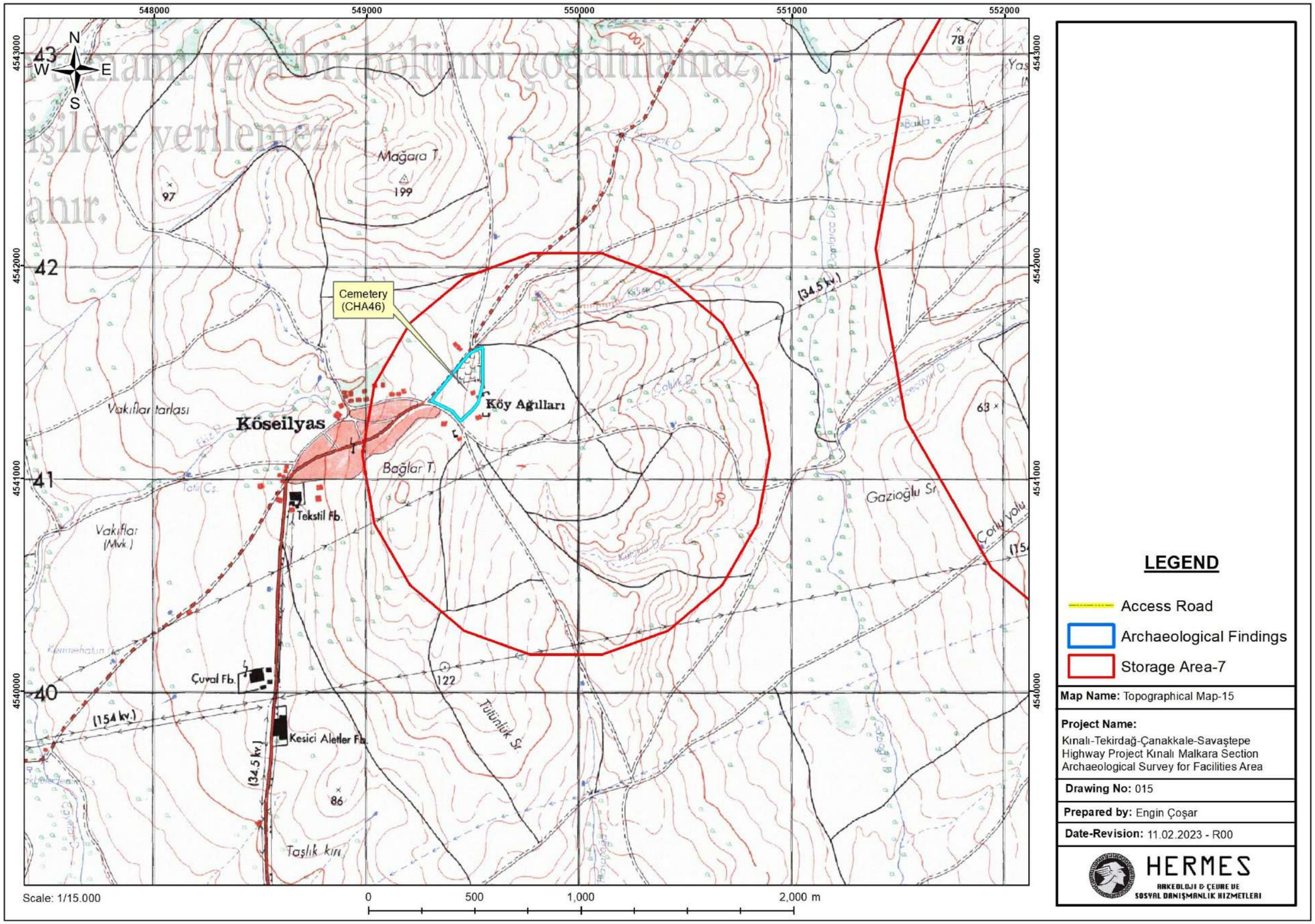
**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ

Harita Genel
kopyalanamaz
Bunu yapanla

tamamı veya bir bölümü çoğaltılamaz,
işlere verilemez,
anır.




## LEGEND

- Access Road
- Archaeological Findings
- Storage Area-7

**Map Name:** Topographical Map-15

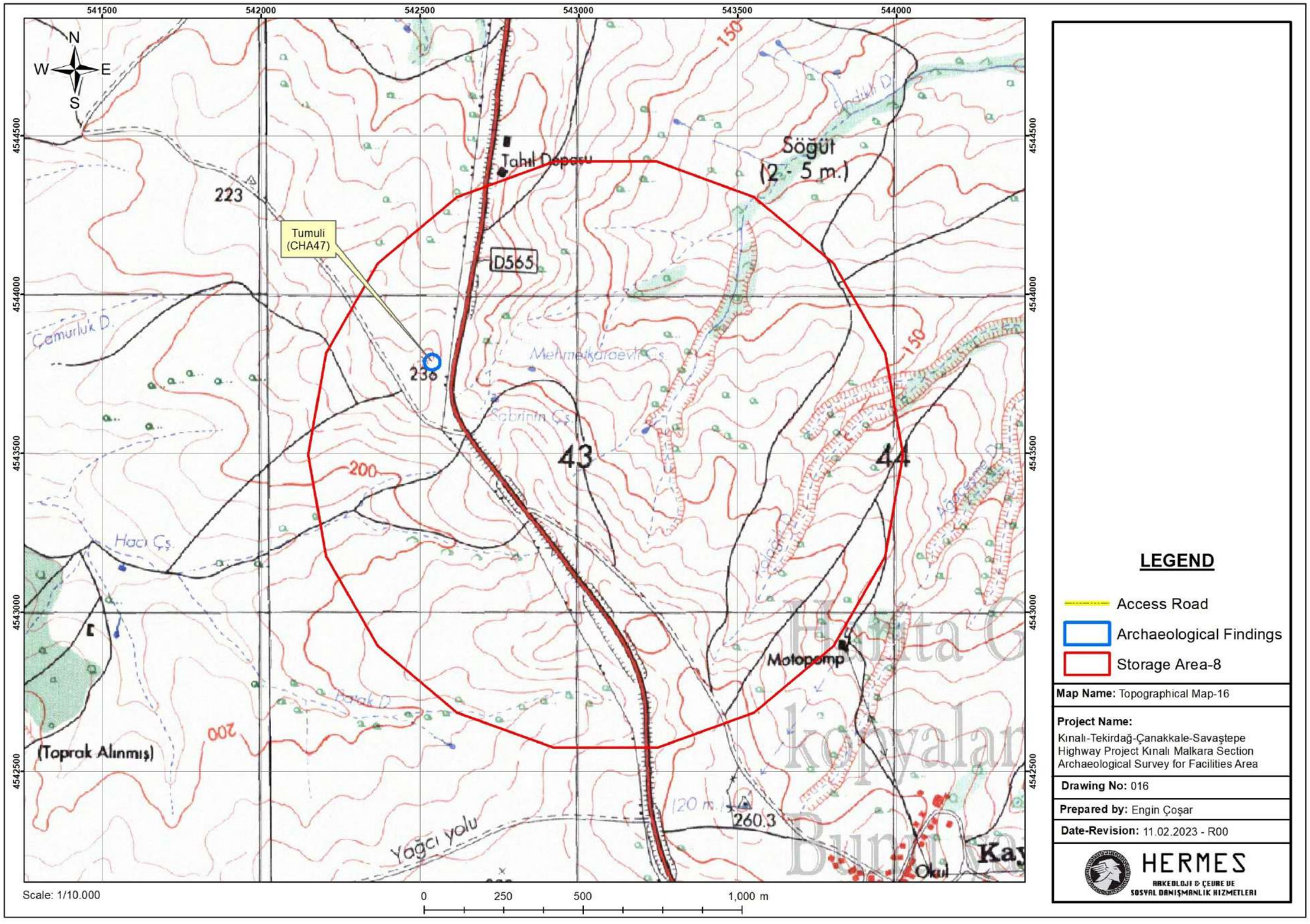
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 015

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




**LEGEND**

- Access Road
- Archaeological Findings
- Storage Area-8

**Map Name:** Topographical Map-16

**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

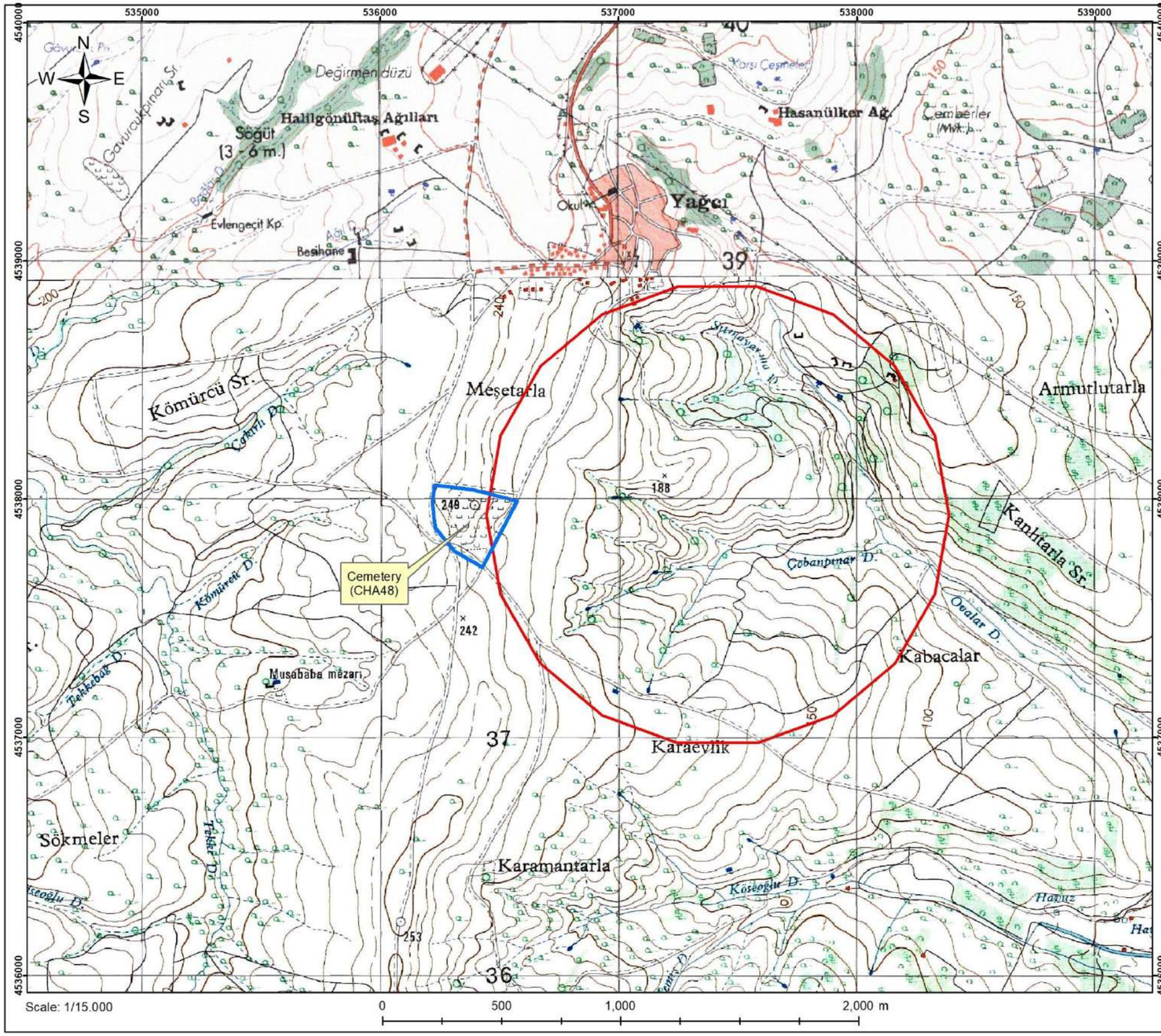
**Drawing No:** 016

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ

Kopyalan




## LEGEND

- Access Road
- Archaeological Findings
- Storage Area-9

**Map Name:** Topographical Map-17

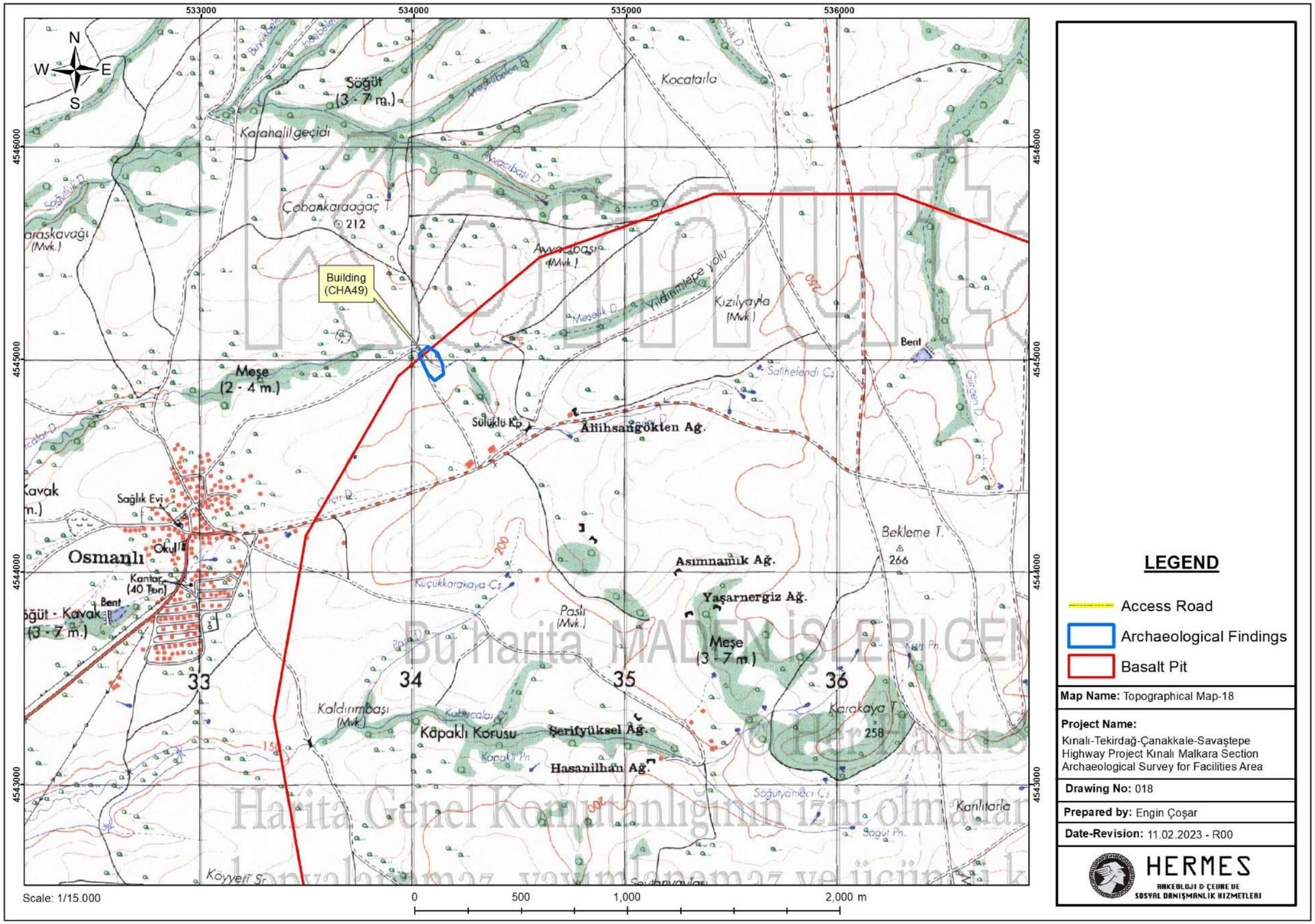
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 017

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




Bu harita, MADEN İŞLERİ GEN
Harita Genel Komutanlığının izni olmadan
kopyalanamaz, yayımlanamaz ve üçüncü k

## LEGEND

- Access Road
- Archaeological Findings
- Basalt Pit

**Map Name:** Topographical Map-18

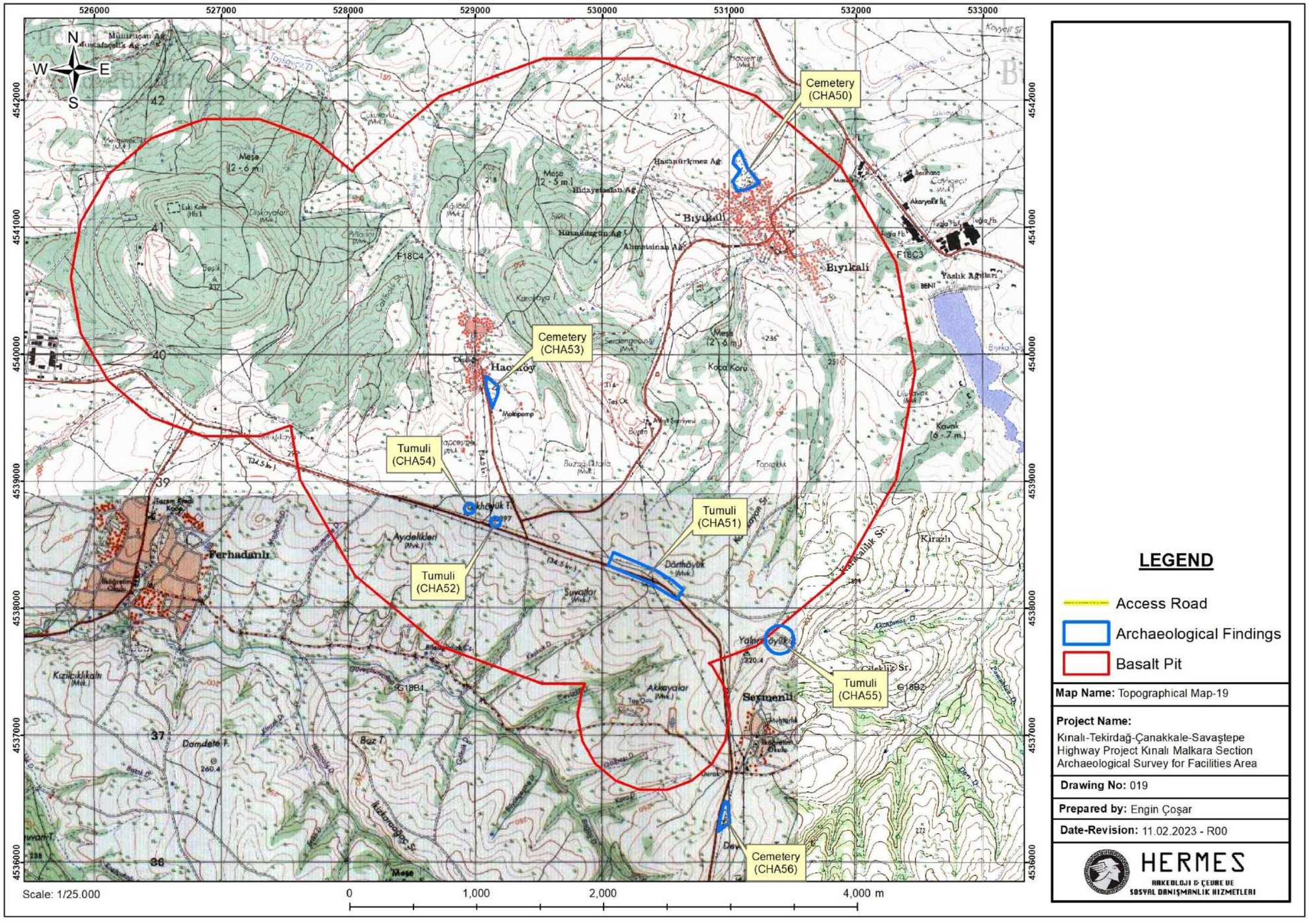
**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

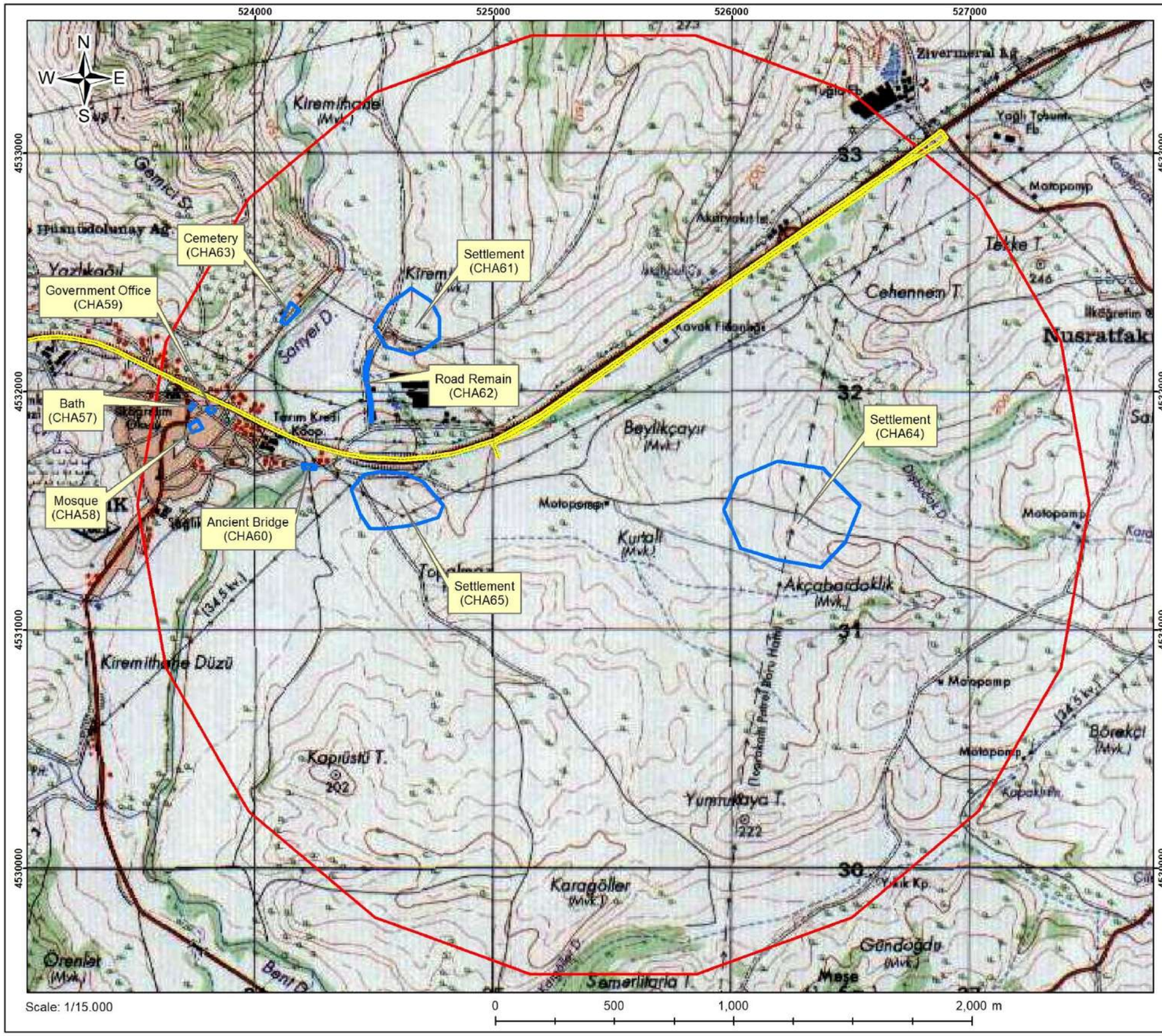
**Drawing No:** 018

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ


526000
527000
528000
529000
530000
531000
532000
533000
4542000
4541000
4540000
4539000
4538000
4537000
4536000
N
W
E
S
Cemetery (CHA50)
Cemetery (CHA53)
Tumuli (CHA54)
Tumuli (CHA51)
Tumuli (CHA52)
Tumuli (CHA55)
Cemetery (CHA56)
Bıyıkali
Haciköy
Ferhadanlı
Sermenli
Kirazlı
F18C4
F18C3
G18B4
G18B2
Scale: 1/25.000
0
1,000
2,000
4,000 m
LEGEND
Access Road
Archaeological Findings
Basalt Pit
Map Name: Topographical Map-19
Project Name:
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area
Drawing No: 019
Prepared by: Engin Çoşar
Date-Revision: 11.02.2023 - R00
HERMES
ARKEOLOJİ & ÇEVRE VE
SOSYAL DANIŞMANLIK HİZMETLERİ




## LEGEND

- Access Road
- Archaeological Findings
- Batch Plant-2, Satellite Construction Site-2 and Precast Beam Production Area

**Map Name:** Topographical Map-20

**Project Name:**
Kınalı-Tekirdağ-Çanakkale-Savaştepe Highway Project Kınalı Malkara Section Archaeological Survey for Facilities Area

**Drawing No:** 020

**Prepared by:** Engin Çoşar

**Date-Revision:** 11.02.2023 - R00

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SOSYAL DANIŞMANLIK HİZMETLERİ



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