TÜRKİYE ORGANIZED INDUSTRIAL ZONES PROJECT
CONSULTANCY SERVICES FOR PREPARATION OF ENVIRONMENTAL AND SOCIAL ASSESSMENT STUDIES FOR SUB-PROJECTS (GROUP-3)

GÜMÜŞHANE ORGANIZED INDUSTRIAL ZONE
SOLAR POWER PLANT PROJECT (950 kWe/1,000 kWp)

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

CNR-PLN-TOIZP-GUM-ESMP-001
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Final Draft

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LIST OF ABBREVIATIONS

ACM	Asbestos Containing Materials
ACNAC	Acceptable to consumers and no abnormal change
AFAD	Disaster and Emergency Management Presidency
AoI	Area of Influence
AQMS	Air Quality Monitoring Station
CFC	Chlorofluorocarbons
CITES	Convention on the International Trade in Endangered Species of Wild Flora and Fauna
CLO	Community Liaison Officers
COD	Chemical Oxygen Demand
CoR	European Committee of the Regions
CORINE	Coordination of Information on the Environment
CR	Critically endangered
dB(A)	Decibel A
DC	Direct Current
DGIZ	Directorate General for Industrial Zones
E&S	Environmental and Social
EDAŞ	Electricity Distribution Inc.
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EKAT	Electric High Current Facilities
EMRA	Energy Market Regulatory Authority
EN	Endangered
ENE	East-Northeast
ERP	Emergency Response Plan
ESCP	Environmental and Social Commitment Plan
ESF	Environmental and Social Framework
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESMR	Environmental and Social Monitoring Report
ESR	Environmental and Social Report
ESS	Environmental and Social Standards
EU	European Union
EUNIS	The European Nature Information System
GBV	Gender-Based Violence
GM	Grievance Mechanisms
GMR	Grievance Mechanism Report
H&S	Health and Safety
HSE	Health, Safety, and Environment

IBA	Important Bird Areas
IBRD	International Bank for Reconstruction and Development
ILO	International Labor Organization
INA	Important Nature Area
IPA	Important Plant Areas
IUCN	International Union for Conversation of Nature
KBA	Key Biodiversity Areas
LC	Least Concern
Lit	Literature
LM Plan	Labor Management Plan
LMP	Labor Management Procedure
LV	Low Voltage
MAK	Central Game Commission
MoEUCC	Ministry of Environment, Urbanization and Climate Change
MoIT	Ministry of Industry and Technology
MoTF	Ministry of Treasury and Finance
MTA	Maden Tetkik Arama/ Mineral Research and Exploration
NE	Northeast (for 5.4 Climate Section)
NE	Not Evaluated (for 5.12 Biodiversity and Protected Areas Section)
NGO	Non-governmental organizations
NTU	Nephelometric Turbidity Unit
Obs.	Observation
OG	Official Gazette
OHS	Occupational Health and Safety
OIZ	Organized Industrial Zone
PAP	Project Affected People
PBB	Polybrominated biphenyls
PBDE	Brominated diphenyl ethers
PFS	Protected Fauna Species
PID	Project Identification Document
PIU	Project Implementation Unit
PM	Particulate matter
POPs	Persistent Organic Pollutants
PPE	Personal Protective Equipment
PR	Public Relations
PS	Performance standard
PV	Photovoltaic
RDB	Red Data Book
SDS	Safety Data Sheet
SEA	Sexual Exploitation and Abuse

SH	Sexual Harassment
SPFS	Strictly Protected Fauna Species
SPP	Solar Power Plant
SRC	Driver Certificate
TEDAŞ	Türkiye Electricity Production Inc.
TOIZP	Türkiye Organized Industrial Zones Project
ToR	Terms of Reference
TurkStat	Turkish Statistical Institute
UNESCO	United Nations Educational, Scientific and Cultural Organization
VU	Vulnerable
WB	World Bank
WBG	World Bank Group
WGM	Workers' Grievance Mechanism
WHO	World Health Organization
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

The Ministry of Industry and Technology (MoIT), in coordination with the Ministry of Treasury and Finance (MoTF), has secured funding from the World Bank (WB) for the implementation of the Türkiye Organized Industrial Zones Project (TOIZsP). The World Bank is the financial institution providing funding to the Project. The Project Owner is Gümüşhane Organized Industrial Zone (OIZ) which under the oversight of the Ministry, will implement the Project through a Project Management Unit (PMU) .

"Gümüşhane Organized Industrial Zone (OIZ) Solar Power Plant (SPP) Project" (the project) will be established within Gümüşhane OIZ as a sub-project of "TOIZsP", which is carried out with MoIT as the implementing agency providing the loan to Gümüşhane OIZ (Project Owner), which is the sub-borrower and the Project Owner.

The project will involve establishment of "Ground-Mounted Solar Power Plant (SPP)" with 950 kWe/1,000 kWp on 142/1 parcel. The land is defined as a Wastewater Treatment Plant (WWTP) area on the spatial plan of the OIZ. The total area where the solar panels will be installed is approximately 12,140 m^2.

Gümüşhane OIZ wants to meet its own electricity consumption with renewable sources. This will both lower its emissions and electrical energy costs and also increase its supply security. All of the electricity generation will be primarily consumed at the OIZ's consumption points. Surplus energy will be deducted from the main meter consumption amount.

Per Annex-1 of the Environmental Impact Assessment (EIA) Regulation (Official Gazette dated 29.07.2022 and numbered 31907), an EIA is mandated only for specialized OIZs during the establishment phase. As Gümüşhane OIZ is classified as a mixed zone, it is exempt from the national EIA requirement. Furthermore, Article 24, subparagraph c, of the Regulation specifies that the EIA process for projects planned in OIZs will be determined by the Ministry of Environment, Urbanization, and Climate Change (MoEUCC).

The same EIA Regulation states that solar power plants (SPPs) with a capacity of 10 MW_m or more, or those covering an area of 20 hectares or more, fall under Annex 1, making them subject to the EIA procedure. Additionally, SPPs with a capacity of 1 MW_m or more, or covering an area of 2 hectares or more, are listed in Annex 2, necessitating pre-examination and environmental impact assessment. According to this regulation, solar photovoltaic (PV) facade and roof systems are not subject to the EIA process.

The Project is not included in the scope of the Annex-1 and Annex-2 lists of the Environmental Impact Assessment (EIA) Regulation (Official Gazette dated 29.07.2022 and numbered 31907) and therefore, it is exempt from an EIA study. The EIA Exemption Letter dated 26.10.2023 and numbered 7774279 issued by Ministry of Environment, Urbanization and Climate Change (MoEUCC) for the Project is presented in Annex-1.1.

600-meter AoI has been determined considering the environmental and social impacts of the project. There are only facilities and businesses located within the AoI of the project . There are no sensitive receptors such as schools, mosques, health centers, etc. in AoI of the project. (see Figure 20).

There are no educational institutions within the boundaries of Gümüşhane OIZ. The nearest educational institution to the project area is "Turkuaz College" approximately 1.4 kilometers away by air distance. There is no mosque within the OIZ. The mosque closest to the project area is Yeniyol Village Mosque which is 1.9 kilometers from the project area.

Since the excavation and installation activities will be short-term and minor, and considering that the project area is within the boundaries of OIZ, it is considered that no environmental noise and air quality baseline measurements are required.

In case of complaints from stakeholders related to air quality and environmental noise, relevant measurements will be carried out by accredited laboratories. Additionally, relevant mitigation measures will be put in place (see Section 8).

A land use map of the region was prepared using the 2020 CORINE data and accordingly, project area is defined as “industrial and commercial units” (see Figure 5).

The 142/1 parcel has grass, bushes, *Pinus nigra* (Austrian pine / Black pine) and *Robinia pseudoacacia* (Black locust) (approximately 50 trees) at around 5,000 m^2, and the soil has not been altered. The soil and vegetation in this area will be disturbed due to construction activities. *Pinus nigra* (Austrian pine / Black pine) and *Robinia pseudoacacia* (Black locust) trees will be relocated before construction works of the Project.

The remaining part has the package type domestic WWTP, the retaining wall, the water ditch and the remaining 2,500 m^2 is covered with subsoil for land levelling purposes. The soil structure was altered at these parts. Project area is within existing lands of Gümüşhane OIZ, hence no land acquisition will be required for this project. OIZ acquired the Project land in 2004 (see Annex-2).

During the construction phase, ten (10) personnel will be employed[1]. Maintenance and cleaning of the SPP will be carried out by non-permanent personnel contracted through external service providers. The management of the SPP will be overseen by the current electrical engineer of the OIZ, and no additional management staff will be recruited.

This Environmental and Social Management Plan (ESMP) identifies the potential risks and impacts that may arise during pre-construction, construction and operation phases of the Project and outlines appropriate mitigation measures to effectively address these risks and impacts. An assessment of the environmental and social impacts of the project is included in Section 7. Section 8 and Section 9 summarize the measures to be taken to avoid/mitigate the identified impacts and monitoring activities for the pre-construction, construction and operation phases of the project.

The TOIZP builds on an existing technical assistance relationship between the MoIT and the WB that helped develop a national framework for Green OIZs in Türkiye and carried out preliminary assessments of the potential impact of OIZ investments. MoIT will be the implementing agency for the project and will provide the loan to Gümüşhane OIZ, as the sub-borrower and the Project Owner. Gümüşhane OIZ will be responsible for the implementation of the project at the local level. The Project Owner will be responsible for monitoring and evaluating the performance of the services provided by the Contractor. The Contractor will carry out the project activities in line with the approved design documents and will be responsible for implementing and applying the mitigation measures given in this ESMP during the construction phase. The Contractor will adhere to its responsibilities specified in this ESMP for compliance with national regulations and the WB Environmental and Social Framework (ESF) and the Environmental and Social Management Framework (ESMF) for the TOIZP.

The Project's anticipated environmental and social impacts/risks will relate to air quality, noise, waste, the socioeconomic environment, occupational health, and safety, as well as community health and safety. The Project will follow the ESMF of the TOIZP, good international industry practice, including WB Environmental and Social Standards (ESSs), World Bank Group (WBG) General Environmental, Health and Safety (EHS) Guidelines,

[1] **Source:** Gümüşhane OIZ SPP Project E&S Screening Form

WBG EHS Guidelines for Electric Power Transmission and Distribution and standards of the national legislation.

The ten (10) ESSs contained in the WB ESF are designed to support Borrowers' projects through the requirements relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the WB. Out of these, six (6) ESSs establish the standards that Borrower and projects must follow throughout the project lifecycle:

- ESS1 Assessment and Management of Environmental and Social Risks and Impacts
- ESS2 Labor and Working Conditions
- ESS3 Resource Efficiency and Pollution Prevention and Management
- ESS4 Community Health and Safety
- ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources
- ESS10 Stakeholder Engagement and Information Disclosure

ESS7 "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities" and ESS9 "Financial Intermediaries" are not relevant to this project as there are no indigenous groups in Türkiye that meet the definition provided in ESS7 and the project does not involve a Financial Intermediary. When any OIZ's area is being determined, the Ministry of Culture and Tourism gives an opinion about the cultural and historical situation of the planned OIZ area. If any cultural and historical area is in that area, those areas are cut off from OIZ's area. In addition, any project that will have adverse impacts on cultural heritage is considered ineligible and screened out from TOIZsP. Therefore, "ESS 8: Cultural Heritage" is not relevant within the project, but Chance Find Procedure is included considering the risk of chance finds during construction works (see Annex-7). Additionally, ESS5 "Land Acquisition, Restrictions on Land Use and Involuntary Resettlement" will not be relevant for this Project since there is no land acquisition. The other six (6) ESSs are directly related to the Project. Scope and aim of the ESS's related to the project are explained in Section 3.2. The project is assessed as "moderate risk" as per Environmental and Social Standard 1 (ESS 1).

Additionally, all national standards and relevant regulations that will be applied within the scope of the Project are given in Section 3.

This ESMP document includes mitigation, monitoring, and institutional measures to be implemented during the pre-construction, construction, and operation phases of the project based on the ESMF of TOIZP. These measures are designed to eliminate, balance, or reduce adverse environmental and social risks and impacts to acceptable levels. The ESMP document primarily focuses on the following topics:

- Identifying environmental and social baseline conditions.
- Identifying potential environmental and social impacts and risks for pre-construction, construction, and operation phases.
- Detailing mitigation measures.
- Outlining monitoring activities.
- Defining roles and responsibilities for implementing mitigation measures and monitoring activities.
- Establishing the institutional structure for project management.
- Conducting interviews with stakeholders.
- Evaluating budget for implementation of ESMP.

The environmental and social impacts addressed within the ESMP, along with the key mitigation measures, are summarized in Table 1.

Table 1. Key Mitigation Measures for the Project Implementation

Potential Environmental and Social (E&S) Impacts	Key Mitigation Measures	
	Construction phase	**Operation Phase**
Air Quality	• Regular maintenance of machinery and equipment • Minimize dust from work sites by applying water spraying on the ground regularly during dry season • Construction activities are carried out at different times in different parts of the project area • Consultation with stakeholders and planning construction activities during periods that will result in least disturbance	• Regular maintenance of operation phase vehicles and equipment will be applied
Noise	• Regular maintenance of machinery and equipment • Consultation with stakeholders and planning construction activities during periods that will result in least disturbance. • Construction activities are carried out at different times in different parts of the project area	• Regular maintenance of operation phase vehicles and equipment will be applied
Water and wastewater	• Not damaging groundwater and other water resources • Minimization of water use for personnel needs	• Not damaging groundwater and other water resources • Minimization of water use for personnel needs and solar panel cleaning
Wastes	• Compliance with the waste management hierarchy (prevention-reduction-reuse-recycling-energy recovery-disposal) • Use of hazardous and non-hazardous waste storage areas • Recycling/disposal of waste by licensed companies • Keeping the project area clean • Storage of broken/ damaged solar panels in the OIZ's waste storage area and delivery of these panels to the licensed recycling/disposal company or producer depending on the agreement	• Compliance with the waste management hierarchy (prevention-reduction-reuse-recycling-energy recovery-disposal) • Use of hazardous and non-hazardous waste storage areas • Recycling/disposal of waste by licensed companies • Keeping the project area clean • Storage of broken/ damaged and end of life solar panels in the OIZ's waste storage area and delivery of these panels to the licensed recycling/disposal company or producer depending on the agreement • Raising personnel awareness on proper disposal of solar panels, specifically avoiding disposal of panels near water bodies
Soil Pollution	• Work machine and vehicle maintenance and repair operations will not be carried out in the project area. These operations will be carried out at the authorized services • Waste and wastewater management activities will be followed as described in this ESMP • Periodic maintenance and repairs of vehicles will be carried out regularly. • Response kits/spill kits to be used in emergency situations will be kept on site	• Waste and wastewater management activities will be followed as described in this ESMP • Response kits / spill kits to be used in emergency situations will be kept on site • proper maintenance of solar panels to avoid pollution to be caused by broken/ damaged solar panels
Biological Environment	• No damage to natural life in and surrounding the project area • No cutting of trees or destruction of	• No damage to natural life in and surrounding the project area

Potential Environmental and Social (E&S) Impacts	Key Mitigation Measures	
	Construction phase	**Operation Phase**
	vegetation except project area • Relocation of Pinus nigra (Austrian pine / Black pine) and Robinia pseudoacacia (Black locust) trees	
Topsoil Stripping	• Full stripping of topsoil from the project area • No loss during stripping and loading of topsoil.	• Utilization of topsoil in green areas within the OIZ
Labor Conditions	• Providing transparent, non-discriminatory, equal recruitment opportunities with respect to ethnicity, religion, language, gender and sexuality • Providing Labor Management Plan (LM Plan) provisions compliant with Labour Management Procedures of the TOIZP, ESS2 and national law and provision of written contracts to workers • Providing trainings on environment, social, occupational health and safety, labor, Grievance Mechanism, gender-based violence (GBV) and sexual exploitation and abuse and sexual harassment (SEA/SH) • Implementation of Grievance Mechanism • Proper adaptation of human rights policy and labor rights	• Providing transparent, non-discriminatory, equal recruitment opportunities with respect to ethnicity, religion, language, gender and sexuality • Providing Labor Management Plan (LM Plan) provisions compliant with Labour Management Procedures of the TOIZP, ESS2 and national law and provision of written contracts to workers • Providing trainings on environment, social, occupational health and safety, labor, Grievance Mechanism, gender-based violence and sexual exploitation and abuse and sexual harassment • Implementation of Grievance Mechanism • Proper adaptation of human rights policy and labor rights
Traffic Management	• Traffic scheduling • Compliance with traffic rules and speed limits • Usage of appropriate traffic signage • Traffic safety and minimum traffic flow disruptions by providing alternative routes • Control driving speed of vehicles particularly when passing through community or nearby school, health center or other sensitive areas	• Compliance with traffic rules and speed limits • Usage of appropriate traffic signage
Community Health and Safety	• Hanging warning signs in and around the project area • Consultation with stakeholders and planning construction activities during periods that will result in least disturbance • Building temporary pedestrian walkways for safety in compliance with the requirements for the passage of individuals with physical challenges and other vulnerable/disadvantaged individuals/groups, such as pregnant, elderly, children • Rope off construction area and secure materials stockpiles/ storage areas from the public and display warning signs including at unsafe locations. Do not allow children to play in construction areas • Ensure structural openings are covered/protected adequately • Fill in all earth borrow-pits once construction is completed to avoid standing water, water-borne diseases and possible drowning • Establishment and operationalization of	• Hanging warning signs in and around the project area • Restricted access • Establishment and operationalization of the Grievance Mechanism

Potential Environmental and Social (E&S) Impacts	Key Mitigation Measures	
	Construction phase	Operation Phase
	the Grievance Mechanism	
Occupational Health and Safety	• Surrounding work areas with barriers • Ensuring that the use of construction equipment is carried out by certified persons • Ensuring that personnel use personal protective equipment (PPE) • Precautions to be taken especially against working at height and fire risk • Safe working procedures • Equipment maintenance • Taking precautions against animals that may bite and sting (snakes, scorpions, etc.)	• Hanging warning signs • Precautions to be taken especially against working at height and fire risk • Safe working procedures • Equipment maintenance • Implementation of necessary mitigation measures especially related with working at height for panel cleaning and repair/maintenance activities during operation phase
Stakeholder Engagement	• Information and Consultation with stakeholders on project and E&S instruments	• Implementation of GM

The implementation of mitigation measures will be followed by the monitoring activities presented in Section 9 and the intentions of these activities are to monitor adverse environmental and social impacts/risks, and to measure the effectiveness of the mitigation measures, including responsibilities and schedule for implementing the monitoring activities.

1. INTRODUCTION

Türkiye is advancing with the “Türkiye Organized Industrial Zones Project (TOIZsP)", funded by the World Bank (WB) and overseen by the Ministry of Industry and Technology’s (MoIT) Directorate General for Industrial Zones (DGIZ), focusing on improved infrastructure and sustainable technologies.

The TOIZsP will involve comprehensive investments in primary infrastructure, such as the establishment and improvement of roads, water and gas pipelines, power lines, and logistics facilities. These investments are intended to support the OIZs functioning and growth, thereby contributing to their efficiency, environmental sustainability and competitiveness.

Additionally, the TOIZsP significantly emphasizes “green” infrastructure, which is pivotal for fostering environmental sustainability. Investments will be made in advanced technologies that will improve energy and water efficiency facilities, foster the development of advanced wastewater treatment plants, encourage the construction of energy-efficient buildings, and replace conventional lighting systems with Light-Emitting Diode (LED) street lighting.

Furthermore, in line with the global trend towards renewable energy sources, the TOIZP includes provisions for the establishment and expansion of renewable energy assets. These will encompass a variety of renewable technologies, such as solar, wind, and biomass, thus facilitating the transition towards a more sustainable and low-carbon industrial sector.

The MoIT, in coordination with the Ministry of Treasury and Finance (MoTF), has secured funding from the WB for the execution of the TOIZP. The WB will support the OIZs through an International Bank for Reconstruction and Development (IBRD) loan, and the MoIT as the relevant Ministry will be responsible for its execution.

The specific objectives of the TOIZP are as follows:

- Energy savings from OIZ investments in basic and green infrastructure (MWh per year)
- Water savings from OIZ investments in green infrastructure (cubic meters per year)
- Reduction in CO_2 emissions due to supported investments (metric tons per year)
- Share of OIZs that attract new investments.

Therefore, “Gümüşhane OIZ Solar Power Plant Project (the project)" will be established within the boundaries of “Gümüşhane OIZ (Project Owner)” in Central (Merkez) district of Gümüşhane province, as a sub-project of the TOIZP, which is carried out in cooperation with the MoIT and the WB. MoIT, being the implementing agency for the project, will provide a loan to Gümüşhane OIZ, as the sub-borrower and the Project Owner. The Industrial Zones Directorate in MoIT will be the responsible Project Implementation Unit (PIU). The Project Owner is Gümüşhane OIZ.

Per Annex-1 of the EIA Regulation (Official Gazette dated 29.07.2022 and numbered 31907), an EIA is mandated only for specialized OIZs during the establishment phase. As Gümüşhane OIZ is classified as a mixed zone, it is exempt from the national EIA requirement. Furthermore, Article 24, subparagraph c, of the Regulation specifies that the EIA process for projects planned in Organized Industrial Zones will be determined by the Ministry of Environment, Urbanization, and Climate Change (MoEUCC).

The same EIA Regulation states that solar power plants (SPPs) with a capacity of 10 MW_m or more, or those covering an area of 20 hectares or more, fall under Annex 1, making them subject to the EIA procedure. Additionally, SPPs with a capacity of 1 MW_m or more, or covering an area of 2 hectares or more, are listed in Annex 2, necessitating pre-examination and environmental impact assessment. According to this regulation, solar photovoltaic (PV) facade and roof systems are not subject to the EIA process.

Under the scope of this project, screening studies have been completed, and the related risk assessment has been conducted. As a result of this assessment, the project is classified as “Moderate” under the World Bank ESF and Environmental and Social Standard 1 (ESS1).

Therefore, this ESMP has been prepared by Çınar Engineering and Consulting Inc. (ÇINAR) for the Gümüşhane OIZ as part of the environmental and social impact and risk assessment studies for the project. The ESMP has been prepared in compliance with the World Bank's ESF, including the Environmental and Social Standards (ESSs), the ESMF, Labor Management Procedures and Stakeholder Engagement Plan of TOIZP and the prevailing national legislation in Türkiye.

1.1 Purpose

The ESMP is designed to systematically identify, assess, and manage the potential environmental and social (E&S) impacts and risks associated with the pre-construction, construction, and operation phases of the project. This document outlines a comprehensive strategy for evaluating these risks and impacts and implements a suite of mitigative measures aimed at either preventing or minimizing any adverse effects.

The purpose of the ESMP is to provide a practical plan for mitigating, managing and monitoring environmental and social risks and impacts and to provide the necessary management tools to ensure compliance with project standards in achieving environmental and social objectives. Additionally, hazards, social and environmental repercussions anticipated to arise throughout the pre-construction, construction and operation phases are identified. The Project's potential effects are outlined, along with the steps that must be taken to minimize and/or reduce risks and/or consequences at their source. The responsible project stakeholders are identified, and monitoring and control actions are decided upon over the project lifespan to prevent and mitigate the consequences detailed in this ESMP.

The ESMP is structured as follows:

- Project description including location,
- Compliance with relevant laws and regulations,
- Assessment of environmental and social baseline of project area and AoI,
- Identification of potential adverse environmental and social impacts/risks,
- Organizational structure for project implementation,
- Strategies to address and oversee environmental and social impacts,
- Engagement and addressing concerns of involved parties,
- Process to address stakeholder complaints.

1.2 Scope

This ESMP covers the project description, legal framework, environmental and social baseline conditions, environmental and social impacts, mitigation management and monitoring plans, institutional arrangements, for the "Gümüşhane OIZ Solar Power Plant Project". The project aims to create a renewable energy infrastructure by installing SPP on 142/1 parcel in Gümüşhane OIZ's boundary. The ESMP provides guidelines to the responsible parties with a set of mitigation measures to be conducted during all stages of the project, including pre-construction, construction, and operation phases to avoid potential adverse environmental and social impacts.

1.3 Deviations from the Approved E&S Screening Study

According to the OIZ statement, there have been no changes since the environmental and social screening phase. The Environmental and Social Screening Report was reviewed during the ESMP studies and no major changes were identified. Missing information has been added to this report according to OIZ declarations.

2. PROJECT DESCRIPTION

2.1 Objectives of the Project

The primary goal of this project is to generate electrical energy from renewable resources, which offer lower carbon emissions and reduced costs, instead of fossil fuel-based energy with high carbon emissions and increasing costs. The fact that our country is an energy importer causes energy prices to be uncontrollable and supply reliability cannot be ensured.

This situation presents significant risks for the industrial sector, which has substantial energy requirements.

Energy consumption is particularly concentrated in OIZs. This project has been designed to manage the need to reduce the load on the transmission network and lower energy costs associated with electricity consumption within the boundaries of the Gümüşhane OIZ.

Currently, electricity consumption of the Gümüşhane OIZ is met from the distribution grid. Specific objectives to be provided by the project are listed below:

- Provide energy for environmental/outside lighting and administrative building.
- Support the green OIZ initiative.
- Implement policies that align with the goals of the eleventh development plan.
- Contribute positively to sustainable economic growth at local, national, and global levels.

2.2 Project Location

The project area is located within the borders of the Gümüşhane OIZ situated in Central (Merkez) district of Gümüşhane province on an area of approximately 12,140 m^2.

Gümüşhane province is in the Eastern Black Sea Region and is bordered by Bayburt to the east, Giresun to the west, Trabzon to the north, and Erzincan to the south.

The location map of the project area is presented in Figure 1.

600-meter AoI has been determined considering environmental and social impacts of the project. There are only facilities and businesses in AoI of project area. There are no sensitive receptors such as schools, mosques, health centers, etc. in AoI of the project area (see Figure 20).

There are no educational institutions within the boundaries of Gümüşhane OIZ. The nearest educational institution to the project area is “Turkuaz College” approximately 1.4 kilometers away by air distance. There is no mosque within the OIZ. The closest mosque to the project area is Yeniyol Village Mosque which is 1.9 kilometers to the project area.

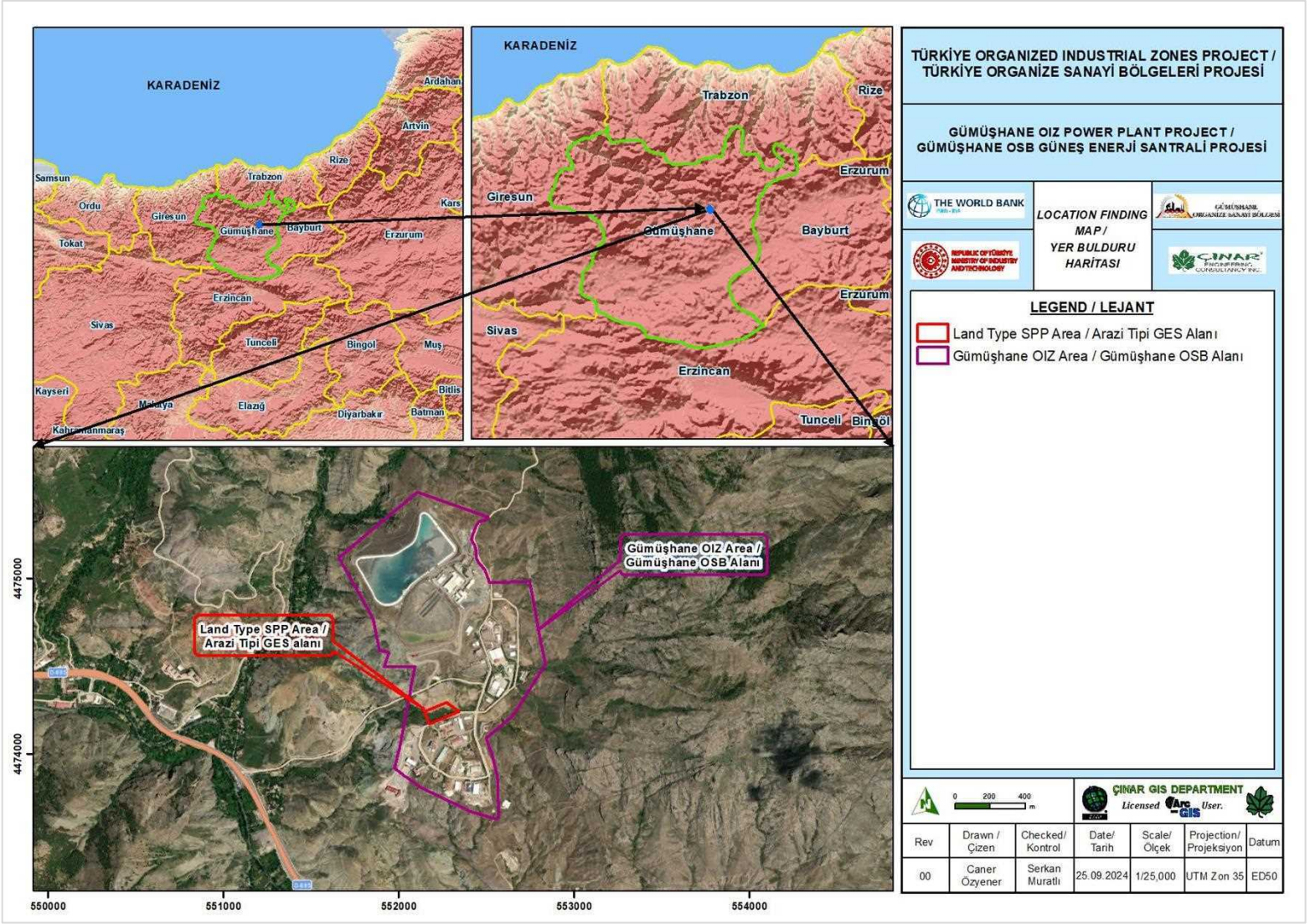

Figure 1. Project Location Map

2.3 Project Components

The Gümüşhane OIZ will establish a ground-mounted solar power plant with a total power of 950 kWe/1,000 kWp to meet its own electricity consumption with renewable sources. This will both lower its emissions and also increase its supply security. All electricity generated will be primarily used at the consumption points within the OIZ. Surplus energy will be deducted from the main meter consumption amount.

Annual average electricity self-consumption of the Gümüşhane OIZ has been approximately 310 MWh over the last six years. In 2022, the total consumption for the OIZ reached 21,206 MWh. The project is anticipated to generate 1,405 MWh of electricity per year. Consequently, a significant portion of the OIZ's electricity self-consumption will be met, with any excess energy reducing the main meter consumption. The project information is summarized in Table 2.

Additionally, there are no associated facilities that will be related to the project.

Table 2. Size and Installed Capacity of SPP Location

No	Location	Type	Module Area (m^2)	Installed Capacity (kWp)	Grid Connection Capacity (kWe)
1	142/1 Parcel	Land	12,140	1,000	950

Works to be conducted within the scope of the ground-mounted SPP project are as follows:

- Supply and installation of solar panels,
- Topsoil stripping and excavations for transformer and inverter buildings, transformer cabling and electric transmission line,
- Piling of poles by piling machine,
- Installation and cabling works,
- Connection of solar panels to transformer by electric line and
- Repair and maintenance in the operation phase.

There will be no accommodation during the construction and operation phases of the project. Estimated length of the electric transmission line (between transformer and nearest electric pole) will be two 2 meters. The electric pole is in OIZ boundary (near the SPP area). Electricity will be distributed to the system from this electric pole. There will be no additional electric distribution line excavation. OIZ has declared that there will be only 2 meters of excavation between the transformer and the electric pole. Due to the very short length (2 meters) of the transmission line and the pending final design with multiple electric poles, a detailed figure has not been included. Further schematic representations will be provided once the design is finalized. The trench excavation will be 2 meters long, 80 cm deep and 80 cm wide between the transformer and the nearest electricity pole. Excess excavated material will be utilized in backfill. Topsoil will be utilized in green areas within the OIZ (Please see Annex-4 for the calculations).

2.4 Project Timeline and Number of Employees

The project implementation period will be around eight (8) months from the connection consent of the authority to the acceptance of the plant (commercial operation date). The 8-month period covered the pre-construction and construction phases of the project (obtaining permits and construction of SPPs). The project will be implemented under the supervision of the technical department of Gümüşhane OIZ. The time schedule is presented in Table 3. The

construction of the ground-mounted SPP will take three (3) months. Excavation works will take 45 days.

Table 3. Project Time Schedule[2]

Task	Months							
	1	2	3	4	5	6	7	8
Technical Assessment of the Proposed Locations								
Grid connection opinion of the EDAŞ (Electricity Distribution Inc.)								
Application to TEDAŞ (Türkiye Electricity Production Inc.) for electrical project approval								
Connection agreement with the EDAŞ								
Construction of the plant								
Acceptance of the plant by the EDAŞ or TEDAŞ								
Signing of the System Usage Agreement with the EDAŞ								
Commercial Operation of the Plant								

Ten (10) personnel will be employed during the construction phase[3]. No additional personnel will be employed during the operation phase of the project.

2.5 Permits and Management System of the OIZ

2.5.1 Management Systems of the OIZ

Gümüşhane OIZ has ISO 9001:2015 Quality Management Certificate valid between 25.05.2022 and 24.05.2025.

OIZ obtains consultancy services from the environmental consulting firm “Tuğlu Mühendislik Mimarlık Çevre Madencilik İnşaat Gayrimenkul Değerleme Danışmanlık ve Ticaret Limited Şirketi” (see Annex-1.3).

2.5.2 Permits

OIZs are regulated by the OIZ Law (Law No: 4562 Date: 12.04.2000), to ensure the structuring of the industry in ready-to-use industrial areas, to prevent environmental and health problems, to use resources rationally, to benefit from information and information technologies.

The procedure to be applied for the projects planned to be built in organized industrial zones is determined by the Ministry of Environment, Urbanization and Climate Change in accordance with Article 24, subparagraph c, of the Regulation on EIA, which came into force after being published in the Official Gazette dated 29.07.2022 and numbered 31907. According to the Annex-1 of the Regulation on EIA, at the establishment phase, EIA is required only for the specialized OIZs. Since the type of Gümüşhane OIZ is mixed, EIA was not required for Gümüşhane OIZ.

The project is not included in the scope of the Annex-1 and Annex-2 lists of the Environmental Impact Assessment (EIA) Regulation (Official Gazette dated 29.07.2022 and numbered 31907) and therefore, it is exempt from an EIA study. The EIA Exemption Letter dated 26.10.2023 and numbered 7774279 issued by MoEUCC for the Project is presented in Annex-1.1.

[2] **Source:** Gümüşhane OIZ SPP Project Project Identification Document
[3] **Source:** Gümüşhane OIZ SPP Project Environmental and Social Screening Form

The water needs of Gümüşhane OIZ are met by two (2) groundwater (caisson) wells. The State Hydraulic Works indicating its no-objection for the use of two (2) wells by the OIZ 12.01.2024 dated and 4239802 numbered is presented in Annex-1.5.

The WWTP is evaluated within the scope of Annex-2 list Article 10.2 "Urban and/or domestic wastewater treatment plants with a capacity of less than 20,000 m^3/day[1,2]" of the Environmental Permit and License Regulation Annex-1 list, which entered into force after being published in the Official Gazette dated 10.09.2014 and numbered 29115.

Gümüşhane OIZ is obligated to obtain an Environmental Permit from the Provincial Directorate of Environmental, Urbanization and Climate Change. OIZ Directorate declared that the Wastewater Treatment Plant is in operation. The domestic wastewater collected from the OIZ has been discharged to the Doğankent (Harşit) Stream (seasonal) with treatment (see Annex-1.11). With an official letter dated 11.12.2023, Gümüşhane OIZ requested information on the Provincial Directorate's eligibility process. (see Annex-1.12). In this context, it is essential to obtain the environmental permit urgently. Gümüşhane OIZ applied to the Provincial Directorate of Environment, Urbanization and Climate Change on 28.11.2023 via the online system to obtain an “Eligibility Letter” (see Annex-1.7). This letter is one of the documents that must be submitted to start the Environmental Permit application process. It has been stated by the OIZ authorities that the environmental permit process is ongoing.

There is an exemption letter regarding environmental noise and air emissions, numbered 8053240, issued by the Provincial Directorate of Environment, Urbanization, and Climate Change for the OIZ.

Gümüşhane OIZ is a network operator as well as holding a distribution company license. Energy Market Regulatory Authority (EMRA) issued a 49-year distribution license to the Gümüşhane OIZ on 14.08.2008. The License number is ED-OSB/1715-3/1240 (see Annex-1.4). This enabled the OIZ to handle all electricity distribution systems inside OIZ.

The Right to Establish, Use and Operate Infrastructure Facilities

According to Article 20 of the OIZ Law no. 4562, OIZs have the right to establish and operate infrastructure and general service facilities such as electricity, water, sewerage, natural gas, treatment facilities, roads, communication and sports facilities within the approved borders of the OIZ. Since the subproject is within the border of OIZ, Gümüşhane OIZ has right to establish and operate the subproject. The services of the OIZ are summarized below.

- Water services: The water needs of Gümüşhane OIZ are met by two (2) groundwater (caisson) wells. The State Hydraulic Works indicating its no-objection for the use of two (2) wells by the OIZ 12.01.2024 dated and 4239802 numbered is presented in Annex-1.5.
- Wastewater services: OIZ’s WWTP
- Solid waste collection services: The Special Provincial Administration collects domestic solid waste, and licensed private firms collect other types of waste (i.e., hazardous, recyclable) that are required to be collected by licensed private firms.

Relevant Legislations

The main regulations related to the design, construction and operation phases of the project are listed below:

- Electricity Market Law (No.6446: Date:14.03.2013)
- Renewable Energy and Electric Energy Generation (Law No: 5346 Date: 10.05.2005)
- Presidential Decision (No: 1044 Date: 09.05.2019)
- Regulation on Unlicensed Electric Generation (Official Gazette (OG) No: 31044 Date: 19.02.2020)

- Electrical Installations Project Regulation (OG No: 29221 Date: 30.12.2004)
- Regulation on Technical Evaluation of Solar Energy-Based Electricity Generation Application (OG No: 30110 Date: 30.06.2017)
- Energy Market Regulatory Authority (EMRA) Board of Directors Meeting Decision (OG No: 8666, Date: 20.06.2019)
- EMRA Board of Directors Meeting Decision (OG No: 31920 Date: 11.08.2022)
- Environmental Impact Assessment Regulation (OG No: 31907 Date: 29.07.2022)
- Occupational Health and Safety (Law No: 6331 Date: 20.06.2012)
- Social Insurances and General Health Insurance Law (Law No: 5510 Date: 31.05.2006)
- Labor Code (Law No: 4857 Date: 22.05.2003)

The Electricity Market Law No. 6446 states that a license must be obtained from the EMRA for electricity generation to the market. The condition of license holders to be limited liability or joint stock companies has been introduced by the Turkish Commercial Code.

Organized Industrial Zones Law (Law No: 4562), which entered into force after being published in the Official Gazette dated 15.04.2004 and numbered 24021, contains the following statements:

"*Article 4- Representatives of the metropolitan municipality, provincial municipality, district municipality, town municipality, chamber of industry established in accordance with the Law on the Union of Chambers and Commodity Exchanges of Türkiye and Chambers and Commodity Exchanges dated 18.5.2004 and numbered 5174, or chamber of commerce and industry, or chamber of commerce, or chamber of commerce, special provincial administration or investment monitoring and coordination presidency, representatives of relevant professional organizations and organizations may take part in the OIZ establishment based on the Ministry's approval. Upon the approval of the establishment protocol signed by the representatives of the institutions and organizations involved in the establishment of the OIZ and the governor by the Ministry and its registration in the registry, the OIZ becomes a legal entity.*

Article 23-The OIZ establishment protocol shall be prepared by the institutions or organizations participating in the establishment of the OIZ and approved by the Ministry."

In this context, the "establishment protocol" is required for the OIZ to gain legal entity and start its activities. The establishment protocol and authorization certificate of the Gümüşhane OIZ are presented in Annex-1.8.

Permits belonging to OIZ is listed below:

- Electricity Distribution License
- Groundwater Usage Permit Letter foe two (2) groundwater wells,
- Establishment Protocol
- Authorization Certificate

Permits required for the OIZ's operation are not in place. Gümüşhane OIZ must complete the environmental permit process, and wastewater discharge into the receiving environment should not occur without obtaining the environmental permit. Gümüşhane OIZ applied to the Provincial Directorate of Environment, Urbanization and Climate Change on 28.11.2023 via the online system to obtain an "Eligibility Letter" (see Annex-1.7). This letter is one of the documents that must be submitted to start the Environmental Permit application process. It has been stated by the OIZ authorities that the environmental permit process is ongoing. It has been declared by the OIZ authorities that the environmental permit is expected to be obtained between June 2025 and August 2025.

3. LEGAL FRAMEWORK

3.1 National Legal Framework

The National Legislation applicable to the management of environmental, social, health and safety aspects of the proposed Project is presented in this section.

Turkish Environmental Law No. 2872, which was published in the Official Gazette No. 18132 on August 11, 1983, describes the fundamental principles required to protect the environment in accordance with sustainable development and sustainable environmental goals. Environmental Law provides a legal framework for the development of environmental regulations in accordance with national and international standards. Following its first publication date of 1983, various amendments have been made.

Significant developments in the field of health and safety in the national context took place with the entry into force of the Occupational Health and Safety Law No. 6331 on 30.06.2012. With the entry into force of the law, detailed regulations on safety and health were made and a road map was drawn. Occupational health and safety legislation in Türkiye has been structured in line with the Constitution. Regulations on occupational health and safety are included in Annex-6.

In addition to Environmental Law and associated regulations, several laws in relation to environmental protection, pollution prevention and control, human rights, health and safety are listed in Annex-6.

3.2 International Standards

The methodology to be used for characterization of environmental and social impacts/risks arising from the implementation of the Project will be developed based on the methodologies described in the WB Environmental and Social Framework (ESF).

Within the ESF, risk categorization is a method used to evaluate projects or programs, identifying their potential environmental and social risks and impacts. This process is essential for customizing the extent of environmental and social assessment, planning, and supervision necessary for each project, taking into account its characteristics and potential risks.

WB classifies all projects into one of four classifications: High Risk, Substantial Risk, Moderate Risk or Low Risk. Based on detailed assessments conducted in the preliminary stages, and considering the potential risks and impacts associated with the project, it has been concluded that this project falls under the category of 'moderate risk'.

WB ESF consists of ten (10) Environmental and Social Standards (ESSs) that are designed to support Borrowers' projects through the requirements relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by WB (see Figure 2). Out of the 10 ESSs, six (6) establish the standards the Borrower and the projects must adhere to throughout the lifecycle of this project.

The main objectives of the ESSs, gaps between the Turkish EIA Regulation and World Bank's ESF and environmental and social studies conducted/to be conducted to fill the gap are summarized in Table 4.

Figure 2. Environmental and Social Standards (ESSs) of ESF

Other guidelines and principles to be followed within the scope of this project are as follows:

- World Bank Group (WBG) General EHS Guidelines (2007)
- WBG EHS Guidelines: Electric Power Transmission and Distribution (2007)

International standards and conventions related with occupational health and safety are listed in below:

- ILO Conventions
  - Convention No. 155 on Occupational Safety and Health, 1981

Convention No. 155 on Occupational Safety and Health, 1981, requires the development, implementation, and periodic review of a consistent national policy concerning occupational safety, health, and the work environment. The aim of this policy is to minimize, to the extent possible, accidents and injuries related to work or arising in the course of work and to prevent occupational hazards present in the work environment.

  - Convention No. 187 on the Promotion of Occupational Safety and Health Framework. 2006,

Convention No. 187 on the Promotion of Occupational Safety and Health Framework, 2006, To gradually establish an effective framework for creating a safe and healthy working environment through national systems and programs on occupational health and safety, contribute to the continuous improvement of occupational health and safety by developing national policies, systems, and programs to prevent workplace accidents, occupational diseases, and fatalities, and aim to sustain efforts at all levels regarding the right to a safe and healthy working environment.

  - Convention No. 161 on Occupational Health Services, 1985,

Convention No. 161 on Occupational Health Services, 1985, Occupational Health Services are services responsible for advising the employer, workers, and their representatives on establishing and maintaining a safe and healthy work environment at a level that meets the most appropriate physical and mental health conditions related to work, aiming to provide employees with a healthy and safe working environment.

  - Convention No. 167 concerning Safety and Health in the Construction Industry, 1988

Convention No. 167 concerning Safety and Health in the Construction Industry, 1988, This Convention applies to all construction activities, including any processes, operations, or transport on the construction site, from the preparation of the site to the completion of the

project, encompassing all types of construction work, building construction, construction engineering, and construction and demolition activities.

- WBG General EHS Guidelines (2007)
  - 2.0 Occupational Health and Safety
  - 3.0 Community Health and Safety
  - 4.0 Construction and Decommissioning

Table 4. Relevance of WB ESSs with the Project

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	E&S Requirements & Measures to Be Followed in this Project to Bridge the Gap
ESS1 Assessment and Management of Environmental and Social Risks and Impacts	Evaluating the consequences of the Project's construction and operation phases on the physical, biological, and social environments. The environmental and social risks and impacts will be identified, and necessary actions and mitigation measures will be determined to avoid or minimize these risks to acceptable levels.	The main gaps between the national EIA and the ESS1 are as follows: • The process of integrating social impact assessment into the Turkish EIA has started in recent years. Especially with the EIA Regulation published in the Official Gazette dated 29.07.2022 and numbered 31907, social impact assessment has started to be included in Turkish EIA. Turkish EIA is currently open for improvement but requires a fully integrated process to reach WB ESS1 standards. • In addition, the requirement to address cumulative impacts of other concurrent projects is limited in Turkish EIA legislation. Under WB ESS1, cumulative impact assessment is in a more emphasized position. • The preparation of Environmental and Social Management Plans has been included in Turkish legislation with the latest regulation. However, the management plans prepared are less comprehensive than the ones required under WB ESS1. • There is limited emphasis on the associated facilities in the national EIA legislation.	Project specific Environmental and social assessment studies will be prepared in accordance with ESS1. In this context, the Environmental and Social Management Framework (ESMF) approved by the World Bank for the TOIZP will be the building block of the environmental and social assessments. This ESMP has been prepared in line with the ESMF and ESS1 to bridge the gap. The environmental and social assessment will cover cumulative impacts as defined in ESS1. Depending on the level of impacts and proposed mitigation measures, necessary additional documents such as a chance finding procedure will be included in the ESMP.
ESS2 **Labor and Working Conditions**	Implementing appropriate working conditions to ensure the safety of those working during the construction and operation phases. Risks to the employees will be identified, and preventive measures, including training, personal protective equipment, measurements, and analysis, will be applied.	Turkish national laws and regulations are generally close to the requirements of ESS2. The grievance mechanism for workers is the most important gap between the two parties. There are no specific requirements for the establishment and implementation of a grievance mechanism in Turkish national legislation.	The Labour Management Procedures (LMP) of the TOIZP will be followed, and Contractor will prepare its own Labour Management Plan (LM Plan) in line with TOIZP's LMP. A Grievance Mechanism for workers' will be established. The implementation of LMP including workers' grievance mechanism have been included in this project specific ESMP. Please refer to 7.2.6.
ESS3 **Resource Efficiency and Pollution Prevention and Management**	Promoting the efficient use of natural resources within the project scope. Plans and procedures will be established and monitored to minimize unnecessary resource use during the Project's construction and operation phases.	Most Turkish national laws and regulations are in line with European Union (EU) directives. There is no major gap between ESS3 and Turkish national legislation. National EIA process is quite successful in identifying impacts. With the EIA Regulation published in the Official Gazette dated 29.07.2022 and numbered 31907, sub-management plans and monitoring plans that provide more detailed mitigation methods have been included in the scope of national EIA. Furthermore, there is no major gaps between the mitigation methods in the national legislation on major environmental issues such as waste, air pollution, water resources and wastewater, noise level and WB ESS3. Mitigation methods defined by national environmental legislation are mostly in line with the WB ESS3.	The project phase specific mitigation and monitoring programs included in this ESMP will be effective in addressing the minor gaps between Turkish legislation and WB ESS3.
ESS4 **Community Health and Safety**	Ensuring the local community is not adversely affected in terms of health and safety during the projects. Necessary precautions will be implemented, and the local community will be kept informed about the projects.	In Turkish national legislation, the general principles of community health and safety are fragmented under different regulations. The general principles are similar to WB ESS4. However, labor influx and gender impacts and violence-based risks are more prominent under the WB ESS4.	The main gaps between national and international standards will be fulfilled by integration of all staff to the training sessions based on GBV, SEA/SH issues. Besides, E&S consultant will conduct ESMP training session prior to construction.
ESS6 **Biodiversity Conservation and Sustainable Management of Living Natural Resources**	Preserving the existing biodiversity in and around the projects area. Measures will be taken to identify and protect any endemic species and to prevent harm to the surrounding biodiversity.	Internationally recognized areas of high biodiversity value such as Key Biodiversity Areas (KBA) are not completely assessed under national legislation. However threatened species in these areas are protected according to the requirements of General Directorate of Nature Conservation and National Parks. There is no habitat assessment and critical habitat assessment requirement in national legislation.	As the Project area is located within the boundaries of the OIZ, the assessments made within the scope of this ESMP will be limited considering the location of the project and distance to the legally protected and internationally recognized areas of high biodiversity value. Additionally, this ESMP has eliminated the gaps between the national legislation and WB standards by considering the requirements stipulated in ESS6.
ESS10 **Stakeholder Engagement and Information Disclosure**	Engaging and informing organizations and individuals who might be affected by the projects. This includes establishing a mechanism for suggestions and complaints and ensuring stakeholders are well-informed throughout the Project's lifespan.	In the Turkish EIA legislation, EIA Report for the projects in the list of Annex-I will be made available to the public opinion at the headquarters of MoEUCC or provincial directorates. Following MoEUCC's final assessment of the EIA report, the Governor's Office will disclose its reasoned decision publicly. For the projects in the list of Annex-II, the final Project Introduction File (PIF) will be disclosed publicly at the Provincial Directorates. Similarly, public information and consultation meetings are held	The TOIZP contains a Stakeholder Engagement Framework (SEF), on which basis a stakeholder management and grievance mechanism will be prepared for this project. Grievance mechanism will be active throughout the project lifetime. Draft and final versions of ESMP document will be disclosed to and consulted with the public through Project Owner's website, and as hard copies in the Project Owner's and relevant mukhtar

ESS	Scope / Aim of the ESS	Gaps between the Turkish EIA Regulation and World Bank's ESF	E&S Requirements & Measures to Be Followed in this Project to Bridge the Gap
		only the projects listed in Annex-I of the Turkish EIA Regulation. However, according to WB ESS10, public/stakeholder consultation meetings (at least once) and information disclosure activities are performed regardless of the category of the project.	offices throughout the project lifetime.

ESS7 "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities" and ESS9 "Financial Intermediaries" are not applicable to these Projects. There are no indigenous groups in Türkiye that fit the definition provided in ESS7, and the projects does not involve a Financial Intermediary. Additionally, ESS5 "Land Acquisition, Restrictions on Land Use and Involuntary Resettlement" will not be relevant for this Project since there is no land acquisition.

When finalizing any OIZ area, the Ministry of Culture and Tourism provides information on cultural and historical areas. If any cultural or historical sites are present, they are excluded from the OIZ area. Therefore, "ESS 8: Cultural Heritage" does not apply to this project, although "chance find" procedures are incorporated due to the risk of chance finds during construction activities.

3.3 Project Standards

Project Standards are determined by considering the most stringent of the national legislation and international standards and guidelines as given in Table 5. The Project Standards provided in Table 4 will be complied with during the implementation of the project.

Table 5. Project Standards

Environmental Standards						
No	**Topic**	**National Standards/Requirements**	**Limit Values in national legislation**	**International Standards/Requirements**	**Limit Values in International legislation**	**Project Standards**
1	Noise	Regulation on Environmental Noise Control (Official Gazette (OG) Date/ Number: 30.11.2022/32029) Annex- 2 "Table-1 Limit Values for environmental noise level"	Industrial Facilities, Transportation: Day time (07:00-19:00): $LA_{eq,\ 5\ min.}$< 65 dB(A) Evening time (19:00-23:00): $LA_{eq,\ 5\ min.}$< 60 dB(A) Nighttime (23:00-07:00): $LA_{eq,\ 5\ min.}$< 55 dB(A)	WBG General EHS Guidelines: Environmental Noise Management Table 1.7.1 – Noise Level Guidelines Noise impacts should not exceed the levels specified in the Table 1.7.1 or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site.	Residential; institutional, educational: Day time (07:00-22:00): One Hour L_{Aeq} dB(A) < 55 dB(A) Nighttime (22:00-07:00): One Hour L_{Aeq} dB(A) < 45 dB(A) Industrial, commercial: Day time (07:00-22:00): Nighttime (22:00-07:00): One Hour L_{Aeq} dB(A) < 70 dB(A)	Residential; institutional, educational[4]: Day time (07:00-22:00): One Hour L_{Aeq} dB(A) < 55 dB(A) Night time (22:00-07:00): One Hour L_{Aeq} dB(A) < 45 dB(A)
2	Air Quality	Regulation on Air Quality Assessment and Management (OG Date/ Number: 06.06.2008 / 26898) Annex-1 B) Limit values, assessment and warning thresholds Regulation on Control of Industrial Air Pollution	**PM_{10}** 24 Hours: 50 µg/m^3 (not exceeded more than 35 times in one year) Annual: 40 µg/m^3 **SO_2** Hourly: 350 µg/m^3 (not exceeded more than 24 times in one year) 24 Hours:125 µg/m^3 Annual and winter period (October 1-March 31): 20 µg/m^3 **NO_2** Hourly: 200 µg/m^3 (not exceeded more than 18 times in one year) Annual: 40 µg/m^3 **Regulation on Control of Industrial Air Pollution** (These limits are for exhaust gas emissions from the working of construction machinery during the construction phase.) Dust: 1 kg/hour Carbon monoxide: 50 kg/hour Hydrocarbons: 3 kg/hour Nitrous oxides: 4 kg/hour Sulfoxides: 6 kg/hour	WBG General EHS Guidelines: Air Emissions and Ambient Air Quality Table 1.1.1: World Health Organization (WHO) Ambient Air Quality Guidelines Emissions should not result in pollutant concentrations that reach or exceed relevant ambient quality guidelines and standards by applying national legal standards or in their absence, the current WHO Air Quality Guidelines or other internationally recognized sources.	**PM_{10} (µg/m^3)** **1-year** 70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline) **24 Hours** 150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline) **$PM_{2.5}$ (µg/m^3)** **1-year** 35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) **24 Hours** 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline) **Sulfur dioxide (SO_2) (µg/m^3)** **24 Hours** 125 (Interim target-1) 50 (Interim target-2) 20 (guideline) **10 minute (µg/m^3)** 500 (guideline) **Nitrogen dioxide (NO_2) (µg/m^3)** **1-year** 40 (guideline) **1-hour** 200 (guideline) **Ozone (µg/m^3)** **8-hour daily maximum** 160(Interim target-1)	**PM_{10}** 24-Hour: 50 µg/m^3 (not exceeded more than 35 times in one year) Annually: 20 µg/m^3 **SO_2** Hourly: 350 µg/m^3 (not exceeded more than 24 times in one year) 24 Hours: 20 µg/m^3 **NO_2** Hourly: 200 µg/m^3 (not exceeded more than 18 times in one year) Annual: 40 µg/m^3 **$PM_{2.5}$ (µg/m^3)** **1-year** 35 (Interim target-1) 25 (Interim target-2) 15 (Interim target-3) 10 (guideline) **24 Hours** 75 (Interim target-1) 50 (Interim target-2) 37.5 (Interim target-3) 25 (guideline) **Regulation on Control of Industrial Air Pollution** Dust: 1 kg/hour Carbon monoxide: 50 kg/hour Hydrocarbons: 3 kg/hour Nitrous oxides: 4kg/hour Sulfoxides: 6 kg/hour

[4] Residential; institutional, educational has been selected due to availability of sensitive receptors such as mosque and school within the area of influence.

					100 (guideline)	
3	Water	Regulation on Water Intended for Human Consumption (OG Date/ Number 17.02.2005 / 25730) Annex-1 Parameters and Limit Values a) Microbiological Parameters b) Chemical Parameters c)Indicator Parameters There are limit values for many parameters within the scope of the Regulation. However, the parameters that must be monitored for drinking and potable water are determined according to "Table A. Control Monitoring Parameters" in Annex-2 of the Regulation.	**Control Monitoring Parameters:** Coliform Bacteria: 0 cfu/100 ml E. coli: 0 cfu/100 ml Enterococci: 0 cfu/100 ml C.perfringens (including spores): 0 cfu/100 ml Acrylamide: 0.1 µg/L Antimony: 5.0 µg/L Arsenic: 10 µg/L Benzene: 1 µg/L Benzo (a) pyrene: 0.01 µg/L Boron: 1 mg/L Bromate: 10 µg/L Cadmium: 5 µg/L Chromium: 50 µg/L Copper: 2 mg/L Cyanide: 50 µg/L 1,2-dichloroethane: 3 µg/L Epichlorohydrin: 0.1 µg/L Fluoride: 1.5 µg/L Lead: 10 µg/L Mercury: 1 µg/L Nickel: 20 µg/L Nitrate: 50 mg/L Nitrite: 0.5 mg/L Total Pesticides: 0.5 µg/L Polycyclic Aromatic Hydrocarbons: 0.1 µg/L Selenium: 10 µg/L Tetrachloroethene: 10 µg/L Trichloroethene: 10 µg/L Total Trihalomethanes: 100 µg/L Vinyl Chloride: 0.5 µg/L Aluminum: 200 µg/L Ammonium: 0.5 mg/L Chloride: 250 mg/L Color (Pt-Co): Acceptable to consumers and no abnormal change (ACNAC) Conductivity: 2,500 µS/cm^{-1} pH: ≤9.5-6.5≤ Iron: 200 µg/L Manganese: 50 µg/L Odor: ACNAC Sulphate: 250 mg/L Sodium: 200 mg/L Taste: ACNAC Total Organic Carbon: No abnormal change (NAC) Turbidity: 1 Nephelometric Turbidity Unit (NTU) Tritium: 100 Bq/L Total Indicative Dose: 0.1 mSv/year	World Health Organization (WHO) Drinking Water Guideline (Fourth edition incorporating the first and second agenda)[5] Table 7.10 Guideline values for verification of microbial quality (Page: 162) Table A3.3 Guideline values for chemicals that are of health significance in drinking-water (Page: 525)	The WHO Drinking Water Guideline include many parameters and limit values for drinking and potable water. The main parameters and limit values are given below: Nitrite: 3 mg/l Nitrate: 50 mg/l Arsenic: 10 µg/L Barium:1300 µg/L Benzene: 10 µg/L Boron: 2.4 mg/l Cadmium: 3 µg/L Chromium: 50 µg/L Fluoride: 1.5 mg/L Mercury: 6 µg/L Selenium: 40 µg/L E. coli: 0/100 ml Coliform bacteria: 0/100 ml Acrylamide: 0.5 µg/L Antimony: 20 µg/l Benzo (a) pyrene: 0.7 µg/l Bromate: 10 µg/L Copper: 2 mg/L Epichlorohydrin: 0.4 µg/L Lead: 10 µg/L Nickel: 70 µg/L Tetrachloroethene: 100 µg/L Trichloroethene: 8 µg/L Vinyl Chloride: 0.3 µg/L Turbidity: ≤0.2 Nephelometric Turbidity Unit (NTU)	Coliform Bacteria: 0 cfu/100 ml E. coli: 0 cfu/100 ml Enterococci: 0 cfu/100 ml C.perfringens (including spores): 0 cfu/100 ml Acrylamide: 0.1 µg/L Antimony: 5.0 µg/L Arsenic: 10 µg/L Benzene: 1 µg/L Benzo (a) pyrene: 0.01 µg/L Boron: 1 mg/L Bromate: 10 µg/L Cadmium: 3 µg/L Chromium: 50 µg/L Copper: 2 mg/L Cyanide: 50 µg/L 1,2-dichloroethane: 3 µg/L Epichlorohydrin: 0.1 µg/L Fluoride: 1.5 µg/L Lead: 10 µg/L Mercury: 1 µg/L Nickel: 20 µg/L Nitrate: 50 mg/L Nitrite: 0.5 mg/L Barium:1300 µg/L Total Pesticides: 0.5 µg/L Polycyclic Aromatic Hydrocarbons: 0.1 µg/L Selenium: 10 µg/L Tetrachloroethene: 10 µg/L Trichloroethene: 8 µg/L Total Trihalomethanes: 100 µg/L Vinyl Chloride: 0.3 µg/L Aluminum: 200 µg/L Ammonium: 0.5 mg/L Chloride: 250 mg/L Color (Pt-Co): Acceptable to consumers and no abnormal change (ACNAC) Conductivity: 2,500 µS/cm^{-1} pH: ≤9.5-6.5≤ Iron: 200 µg/L Manganese: 50 µg/L Odor: ACNAC Sulphate: 250 mg/L Sodium: 200 mg/L Taste: ACNAC Total Organic Carbon: No abnormal change (NAC) Turbidity: ≤0.2 NTU Tritium: 100 Bq/L Total Indicative Dose: 0.1 mSv/year
4	Wastewater	Regulation on Water Pollution Control Annex- Table 19 Discharge Standards of Mixed Industrial Wastewater into the Receiving Environment (Small and Large Organized Industrial Zones and Other Industries	**Regulation on Water Pollution Control[6]** Chemical Oxygen Demand: 250 mg/L Total Suspended Solid: 200 mg/L Oil and Grease: 20 mg/L Total Phosphorus: 2 mg/L Total Chromium:2 mg/L Chromium (Cr^{+6}): 2 mg/L	The WB EHS Guidelines do not specify limit values for discharge to sewerage but include indicative values for treated sanitary sewage discharges. Within the scope of the project, mobile toilets with their own reservoirs will be used during the construction phase, or a leak-proof septic tank will be constructed by the OIZ. In both options, the	-	Chemical Oxygen Demand: 250 mg/L Total Suspended Solid: 200 mg/L Oil and Grease: 20 mg/L Total Phosphorus: 2 mg/L Total Chromium:2 mg/L Chromium (Cr^{+6}): 2 mg/L Lead: 2 mg/L

[5] https://www.who.int/publications/i/item/9789241549950

[6] The wastewater generated from the project will be directed to the OIZ sewage system. Therefore, the discharge standards for the sewer have been considered. Under normal conditions, this wastewater must be treated at a treatment facility and discharged in accordance with the environmental permit.

		Where Sector Identification Cannot be Made)	Lead: 2 mg/L Total cyanide: 1 mg/L Cadmium: 0.1 mg/L Iron: 10 mg/L Fluoride: 15 mg/L Copper: 3 mg/L Zinc: 5 mg/L Mercury: 0.05 mg/L Sulphate: 1,500 mg/L Total Kjeldahl-Nitrogen: 20 mg/L Fish Bioassay (ZSF): 10 Color: 280 Pt-Co pH: 6-9	collected wastewater will be extracted with vacuum trucks and transferred to the OIZ's WWTP. If required, the nearest licensed wastewater treatment plant, the Gümüşhane Municipality WWTP, can be utilized under a protocol/agreement with the Municipality. Since the wastewater from the Project will be transferred to the WWTP, Table 19 of the Regulation on Water Pollution Control has been considered as the Project standard.		Total cyanide: 1 mg/L Cadmium: 0.1 mg/L Iron: 10 mg/L Fluoride: 15 mg/L Copper: 3 mg/L Zinc: 5 mg/L Mercury: 0.05 mg/L Sulphate: 1,500 mg/L Total Kjeldahl-Nitrogen: 20 mg/L Fish Bioassay (ZSF): 10 Color: 280 Pt-Co pH: 6-9
Occupational Health and Safety Standards						
1	Noise	28.07.2013 dated 28721 numbered Regulation on Protection of Employees from Risks Related to Noise	Minimum exposure action values: 80 dB(A). Maximum exposure action values: 85 dB(A). Exposure limit values: 87 dB(A).	Word Bank Group Environmental, Health, and Safety (EHS) Guidelines	No employee should be exposed to a noise level greater than 85 dB(A) for a duration of more than 8 hours per day without hearing protection. In addition, no unprotected ear should be exposed to a peak sound pressure level (instantaneous) of more than 140 dB(C).	Minimum exposure action values: 80 dB(A). Maximum exposure action values: 85 dB(A). Exposure limit values: 87 dB(A).
2	Vibration	22.08.2013 dated 28743 numbered Regulation on Protection of Employees from Risks Related to Vibration	For hand-arm vibration: Daily exposure limit value for an eight-hour working period: 5 m/s². Daily exposure action value for an eight-hour working period: 2.5 m/s². For whole-body vibration: Daily exposure limit value for an eight-hour working period: 1.15 m/s². Daily exposure action value for an eight-hour working period: 0.5 m/s².	Word Bank Group Environmental, Health, and Safety (EHS) Guidelines	For hand-arm vibration: Daily exposure limit value for an eight-hour working period: 5 m/s². Daily exposure action value for an eight-hour working period: 2.5 m/s². For whole-body vibration: Daily exposure limit value for an eight-hour working period: 1.15 m/s². Daily exposure action value for an eight-hour working period: 0.5 m/s².	For hand-arm vibration: Daily exposure limit value for an eight-hour working period: 5 m/s². Daily exposure action value for an eight-hour working period: 2.5 m/s². For whole-body vibration: Daily exposure limit value for an eight-hour working period: 1.15 m/s². Daily exposure action value for an eight-hour working period: 0.5 m/s².
Social Standards						
No	**Topic**	**National Laws / Regulations**	**International Standards**	**Project Standards**	**Non-Compliances / Corrective Actions**	**Targets**
1	Stakeholder Engagement, Grievance Mechanism and Information Disclosure	Constitution Article 74 Laws on the Right to Information (No. 4982) Regulation on the Principles and Procedures for the Enforcement of the Law on the Right to Information Law on Use of the Right to Petition (3071) Law on the Protection of Personal Data Environmental Law	World Bank ESS1, ESS2, ESS4 and ESS10	Social procedures and issues will be carried out in compliance with the relevant WB ESSs.	- Awareness campaigns on public grievance mechanism Ensuring accessible public communication tools	Decrease on number of open public grievances
2	Labor and working condition	Labor Law (Law No. 4857) Occupational Health and Safety Law (Law No. 6331)	World Bank ESS1, ESS2, and ESS10	Implementing appropriate working conditions to ensure the safety of those working during the construction and operation phases.	Conducting of training sessions including SEA /SH and GBV issues, forced labor, and child labor Awareness campaigns on Workers' grievance mechanism Training programs on WGM will be conducted by Contractor	Decrease on number of open workers' grievances and reported near-misses and/or incidents High percentage of local people, women etc. groups among employees
3	Community health and safety	Occupational Health and Safety Law (Law No. 6331) Public Health Law (Law No. 1593)	World Bank ESS1, ESS4 and ESS10	Ensuring the local community is not adversely affected in terms of health and safety during the projects	Awareness campaigns on public grievance mechanism Ensuring accessible public communication tools	Decrease on number of open public grievances

4. METHODOLOGY

Desktop Study

Within the scope of desktop study, the agreement between ÇINAR and MoIT on the project was examined in detail and the necessary work was determined. The Project Identification Document (PID) and Screening Reports prepared during the project preparation phase were evaluated. A meeting was held with the Gümüşhane OIZ prior to the field visit to ensure that the information in the studies was up to date.

Data Collection

The following reports & data were requested from the OIZs to be able to provide the services demonstrably committed as per the Terms of Reference (ToR):

- Information provided by OIZ,
- Approved E&S Screening Forms and Screening Report (prepared by MRC Türkiye & ACE Consulting and Engineering),
- PID (prepared by MRC Türkiye & ACE Consulting and Engineering),
- Digital data for mapping studies,
- Permits and licenses,
- Environmental permit process,
- Official correspondence with the relevant state authorities,
- Zoning plan,
- Number of workers to work for the project,
- Timeline of the project,
- Number and type of vehicles/work machines to be used during the project implementation,
- Excavation dimensions.

Area of Influence Definition and Justification

The impact area of the project is determined as a circle with a radius of 600 meters from the project area.

600-meter AoI has been determined considering the environmental and social impacts of the project. There are only facilities and businesses in AoI of project area. There are no sensitive receptors such as schools, mosques, health centers, etc. in AoI of the project area.

There are no educational institutions within the boundaries of Gümüşhane OIZ. The nearest educational institution to the project area is “Turkuaz College” approximately 1.4 kilometers away by air distance. There is no mosque within the OIZ. The closest mosque to the project area is Yeniyol Village Mosque which is 1.9 kilometers to the project area.

Site Visits and Surveys

A site visit was conducted on 22.07.2024 (see Photograph 1 and Photograph 2) during the preparation of ESMP. The site visit within the scope of the ESMP covered the inspection of project area and AoI. The participation form for the site visit scheduled for 22.07.2024 is provided in Annex-12.

For the preparation of ESMP, interviews were conducted with the stakeholders. Stakeholders include the OIZ Administrative Building, facilities located near the Project area and nearby residential area. Detailed photographs of the immediate vicinity of the project area and photographs taken during interviews with stakeholders are presented in Annex-5.

Photograph 1. Site Visit Opening Meeting (22.07.2024)

Photograph 2. Site Visit Participants (22.07.2024)

Interviews with Stakeholders

WB ESS10 sets out the following objectives/actions concerning interviews with stakeholders:

- To carry out an interview process that gives the stakeholders a chance to voice their opinions on the project's risks, impacts, and mitigation measures, and that enables the Project Owner to take those opinions into consideration and respond.
- To consider the outcomes of the interview process with the stakeholders when identifying project-related risks and consequences.

Conducting interviews had the aim to engage in a meaningful dialogue with stakeholders, receive input on analysis and proposed plans, discuss concerns, and inform the Borrower's decisions, where appropriate. Interviews should be designed and implemented in a way that considers the needs of vulnerable groups.. In line with this methodology, interviews mentioned have been conducted. Please refer to Table 37 under STAKEHOLDER MANAGEMENT UNDER ESMP.

ÇINAR will be responsible for organizing and conducting stakeholder interview meeting(s) to inform the public on the outputs, results, and impacts of the sub-project. At least one (1) stakeholder interview will be conducted within the scope of ESMP.

Impact Assessment Methodology

The primary objective of conducting an environmental and social impact assessment is to identify and evaluate potential risks and adverse effects that may arise from the activities of the project on both the natural environment and the socio-economic well-being of the local and regional population, including the community and workforce. This assessment takes into consideration the characteristics and activities of the Project as well as the existing conditions in the project area.

Following the assessment, relevant mitigation measures are devised to prevent, minimize, alleviate, or offset significant adverse impacts while also enhancing beneficial effects. Additionally, the assessment evaluates the significance of any residual adverse effects on the environment and community that may persist even after implementing the mitigation measures. Lastly, the assessment outlines planned monitoring activities aimed at assessing the effectiveness of the proposed mitigation measures.

Throughout the pre-construction, construction and operation phases of the project, there is a potential for environmental and social impacts or risks stemming from the project activities. During the construction phase, these impacts are typically short-term with low to medium magnitude but can be locally significant. They may involve issues such as traffic, noise,

vibration, air quality, soil disturbance and contamination, waste management, community health and safety, as well as labor and working conditions, including occupational health and safety.

While adverse environmental impacts during the operation phase are not expected to be significant due to the project's public interest nature, noise, air related impacts on sensitive receptors, as well as occupational health and safety risks, may arise, particularly during maintenance and repair activities. Maintenance and repair works may result in minor environmental impacts like soil contamination and increased noise levels, which are local and short-term in nature with low significance.

To appropriately address these potential impacts, both positive and negative effects must be identified and assessed, leading to the definition of relevant mitigation measures. The evaluation of environmental and social impacts and risks is conducted based on specific criteria given below:

- The nature/type of impact (positive or negative, direct, indirect, cumulative),
- Extent/area of impact (on-site/project footprint, local, regional, national),
- Duration of impact (short-term, mid-term, long-term, permanent), and
- Likelihood of impact occurrence (very likely/certain, likely, unlikely).

The severity of adverse impacts is assessed using these criteria, along with the sensitivity of receptors or sources exposed to the impact, whenever possible. The significance of impacts is evaluated both without mitigation measures and with proposed mitigation measures in place. This evaluation helps determine the significance of residual impacts, which refers to impacts that remain after implementing mitigation measures.

The following impact significance matrix (see Table 9) depending on the estimated magnitude of the impact and reversibility of the change due to the impact has been used to determine the significance of the environmental, social, health and safety impacts of the project activities during the construction and operation phases.

Table 10. Impact Significance Matrix[7]

Significance of Impact				
Reversibility of the Change	**Magnitude of Impact**			
	High	**Medium**	**Low**	**Negligible/None**
Irreversible	Very High	High	Moderate	Negligible/None
Partially Reversible	High	Moderate	Minor	Negligible/None
Highly Reversible	Moderate	Minor	Minor	Negligible/None
Fully Reversible	Negligible/None	Negligible/None	Negligible/None	Negligible/None

The terms regarding the significance of an impact can be described as follows:

- **Very High:** An impact that causes irreversible and large-scale change, affecting a highly sensitive receptor or source, with a very likely or certain occurrence. For

[7] **Reversibility:** The degree to which the change caused by the impact can be restored to its original state or condition.
Magnitude: The scale or intensity of the impact, measured by its extent, duration, and likelihood.
Impact Significance Level: The overall rating of the impact, based on its reversibility and magnitude, as well as the sensitivity of the receptors or sources affected by the impact.

example, permanent loss of biodiversity or cultural heritage, or severe violation of human rights or labor standards.

- **High:** An impact that causes partially reversible and large or medium-scale change, affecting a moderately sensitive receptor or source, with a likely or probable occurrence. For example, significant degradation of air or water quality.
- **Moderate:** An impact that causes highly reversible and medium-scale change, affecting a lowly sensitive receptor or source, with an unlikely or possible occurrence. For example, moderate increase of noise or traffic levels.
- **Minor:** An impact that causes fully reversible and negligible change, affecting a non-sensitive receptor or source, with a very unlikely or improbable occurrence. For example, slight increase of dust or odor emissions, or minor improvement of social infrastructure or services.
- **Negligible/None:** An impact that causes no discernible change or has a positive effect that outweighs any negative effect. For example, no impact or net benefit on the environment or the community.

The impact assessment methodology was structured to comprehensively identify and evaluate the potential environmental and social risks and impacts arising from the Projects' activities. These assessments covered the primary activities of the Projects and also included the related operations. By adopting this comprehensive approach, it was aimed to thoroughly analyze every aspect of the Projects for potential risks, providing a holistic understanding and ensuring that effective mitigation strategies are in place.

Approach to Define the Mitigation Measures for the Impacts

ESMPs include measures and actions in accordance with the mitigation hierarchy that aim to reduce potential adverse environmental and social impacts to acceptable levels. The impacts of the Project are covered in detail in this plan. Following the identification and definition of the impacts, mitigation measures are planned that aim to achieve the most practical and effective reduction of the adverse impacts.

5. ENVIRONMENTAL BASELINE OF THE PROJECT

5.1 Project Location

The project area is located within the borders of the Gümüşhane OIZ situated in Central (Merkez) district of Gümüşhane province in an area of approximately 12,140 m^2. The project area belongs to Harmancık Village. The project area (Plot:142, Parcel:1) is owned by Gümüşhane OIZ (see Annex-2).

600-meter AoI has been determined considering the environmental and social impacts of the project. There are only facilities and businesses in AoI of project area. There are no sensitive receptors such as schools, mosques, health centers, etc. in AoI of the project area (see Figure 20).

There are no educational institutions within the boundaries of Gümüşhane OIZ. The nearest educational institution to the project area is “Turkuaz College” approximately 1.4 kilometers away by air distance. There is no mosque within the OIZ. The closest mosque to the project area is Yeniyol Village Mosque which is 1.9 kilometers to the project area.

Views from the project area are given in Photograph 3 and Photograph 4. Detailed photographs of the immediate vicinity of the project area are presented in Annex-5.

Photograph 3. General View of the Project Area-1

Photograph 4. General View of the Project Area-2

Settlements around the Gümüşhane OIZ are shown in Figure 3. The distances of the project area to these settlements are given in Table 6. Until now, there have been no complaints from settlements regarding dust or odor originating from the Gümüşhane OIZ.

Table 6. Distances of Project Area to the Settlements

Location	Distance to Project Area (km)
Bahçecik village, Merkez district	2.1
Yeniyol village, Merkez district	2.2
Harmancık village, Merkez district	2.3
Pirahmet village, Merkez district	2.7
Tekke village, Merkez district	3.14
Arzularkabaköy district	3.2

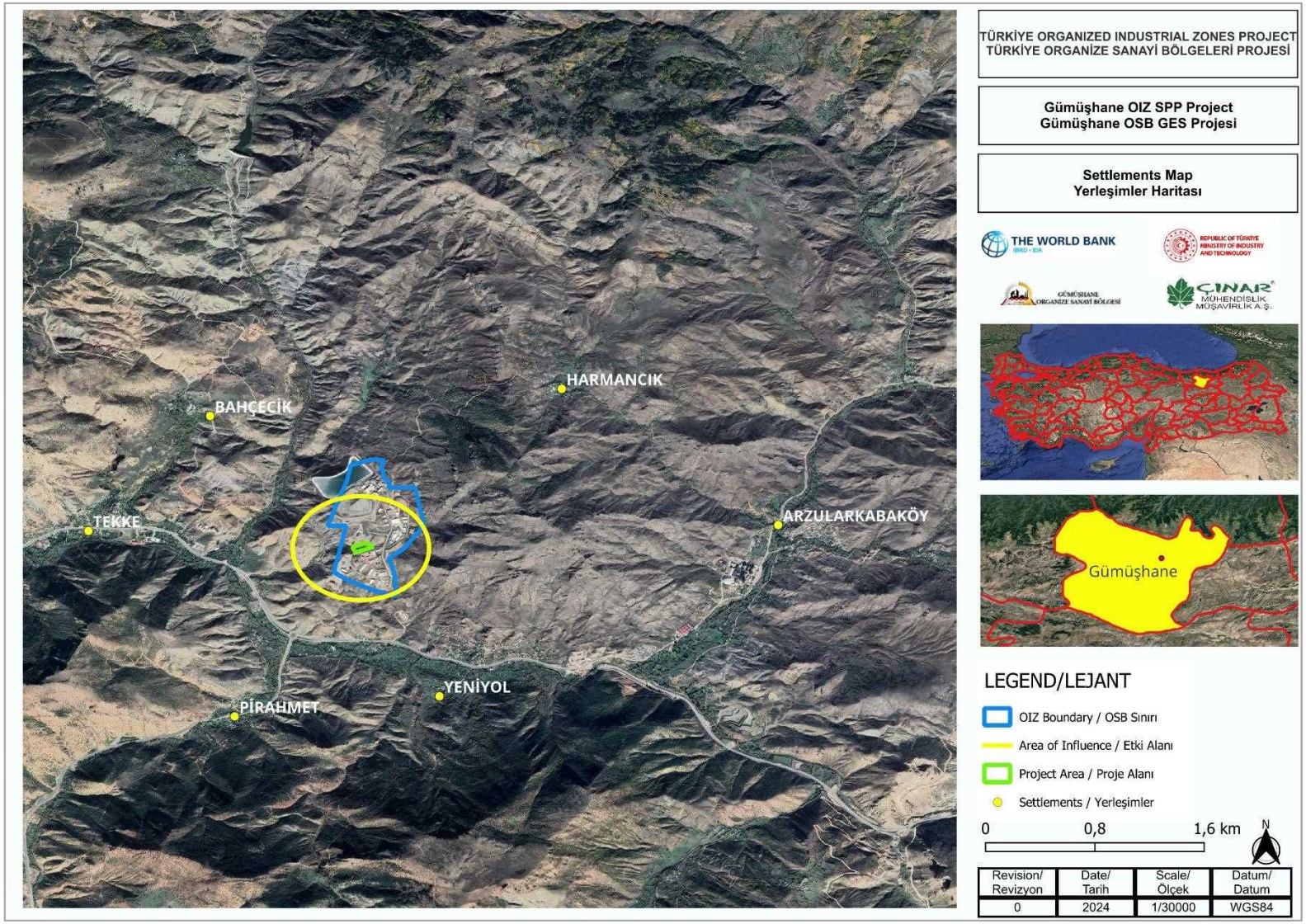

Figure 3. Settlements Map

5.2 Land Use and Topography

The total area of Gümüşhane OIZ is 102 ha and comprises 56 industrial parcels. The occupancy rate of the OIZ is 76.79% (see Table 7). The spatial plan for OIZ was approved on 03.08.2015 at the latest is given in Annex-10.

Table 7. Parcel Activity Status Distribution

Activity Status of the Industrial Parcels	Number of Parcels	Ratio (%)
Production	28	50.00
Construction	8	14.29
Project	7	12.50
Empty Plot	13	23.21
Total	**56**	**100**

Approximately 77.51% of the total area is used for industrial purposes, and the remaining is used for other facilities and purposes.

Table 8 provides the distribution of land use referring to the spatial plan. The project is planned on the OIZ's Treatment Plant Area.

Table 8. Land Use Distribution

Types of Land Uses	Area (m^2)	Percentage (%)
Industrial Area	79.06	77.51
Administrative and Social Facility Area	1.31	1.28
Park Area	3.65	3.58
Technic Service Area	0.53	0.52
Occupational Education Facilities Area	0.72	0.71
Sports Facility Area	0.94	0.92
Health Protection Tape Area	7.79	7.64
Road and Auto Park Area	2.00	1.96
Reforestation Area	3.50	3.43
Recreation Area	1.25	1.23
Transformer Area	0.03	0.03
Treatment Plant Area	1.21	1.19
Total Area	**102.00**	**100**

The project will be established on 142/1 parcel. This parcel is allocated as a treatment plant area. The total area of the parcel is approximately 12,140 m^2. The entire area of the parcel will be utilized for the project. A package type domestic WWTP is located on the parcel where the ground-mounted SPP will be established. It covers around 30 m^2 area and is located at the south edge of the parcel.

The project parcel is owned by Gümüşhane OIZ. The title deed for the 142/1 parcel where the ground-mounted SPP project is located is presented in Annex-2.

A land use map of the region was prepared using the 2020 CORINE data and accordingly, project area is defined as “industrial and commercial units” (see Figure 5).

A topographic map indicating the project area and OIZ boundary is given in Figure 6.

The 1/5,000 scale Gümüşhane OIZ Additional and Revision Zoning Plan is given in Annex-10.

According to the Gümüşhane 1/100.000 Environmental Plan (adopted and still in effect since 2011, shown in Figure 4, the land use around the OIZ borders is classified as “organized industrial zone”.

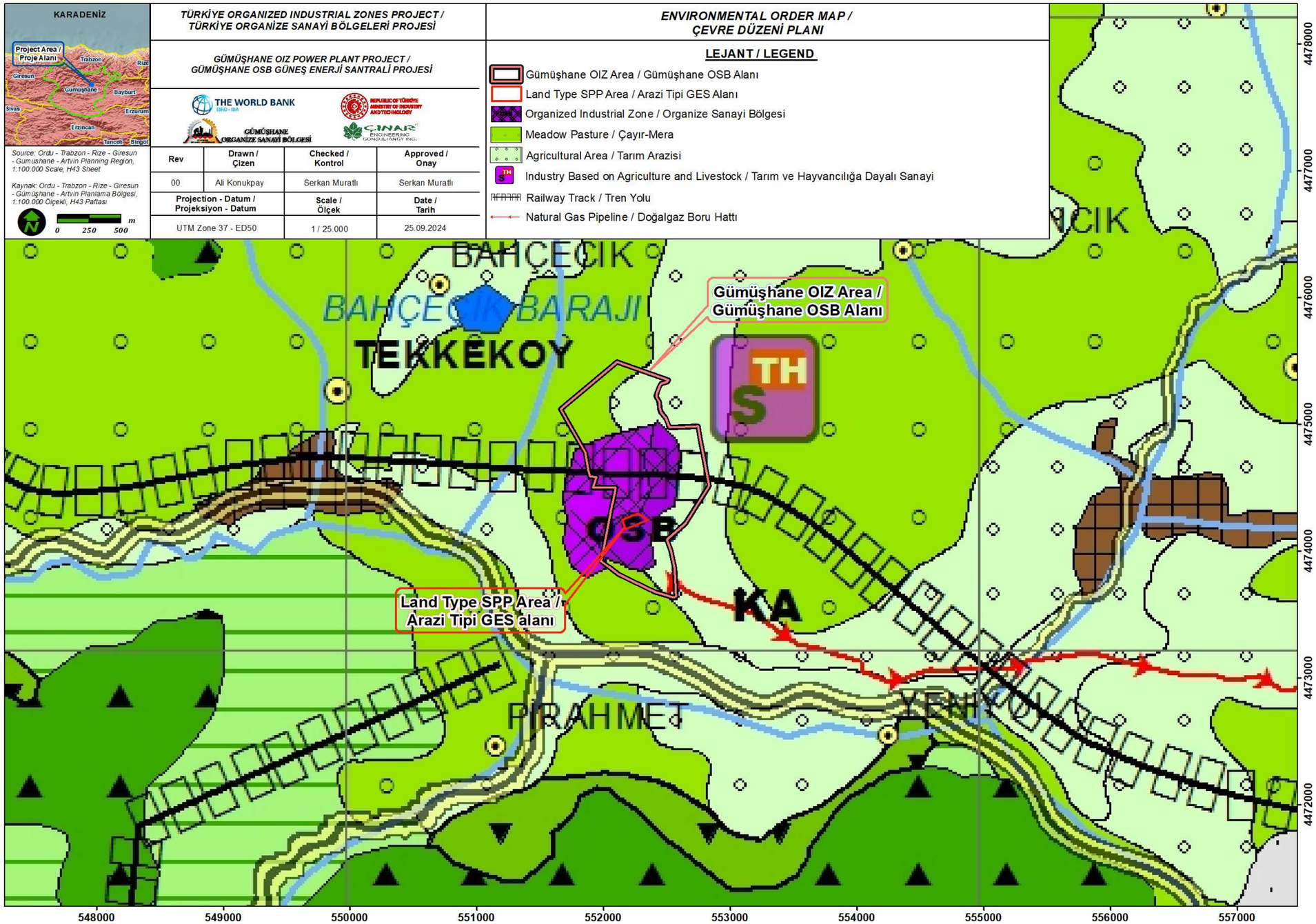

Figure 4. Environmental Plan

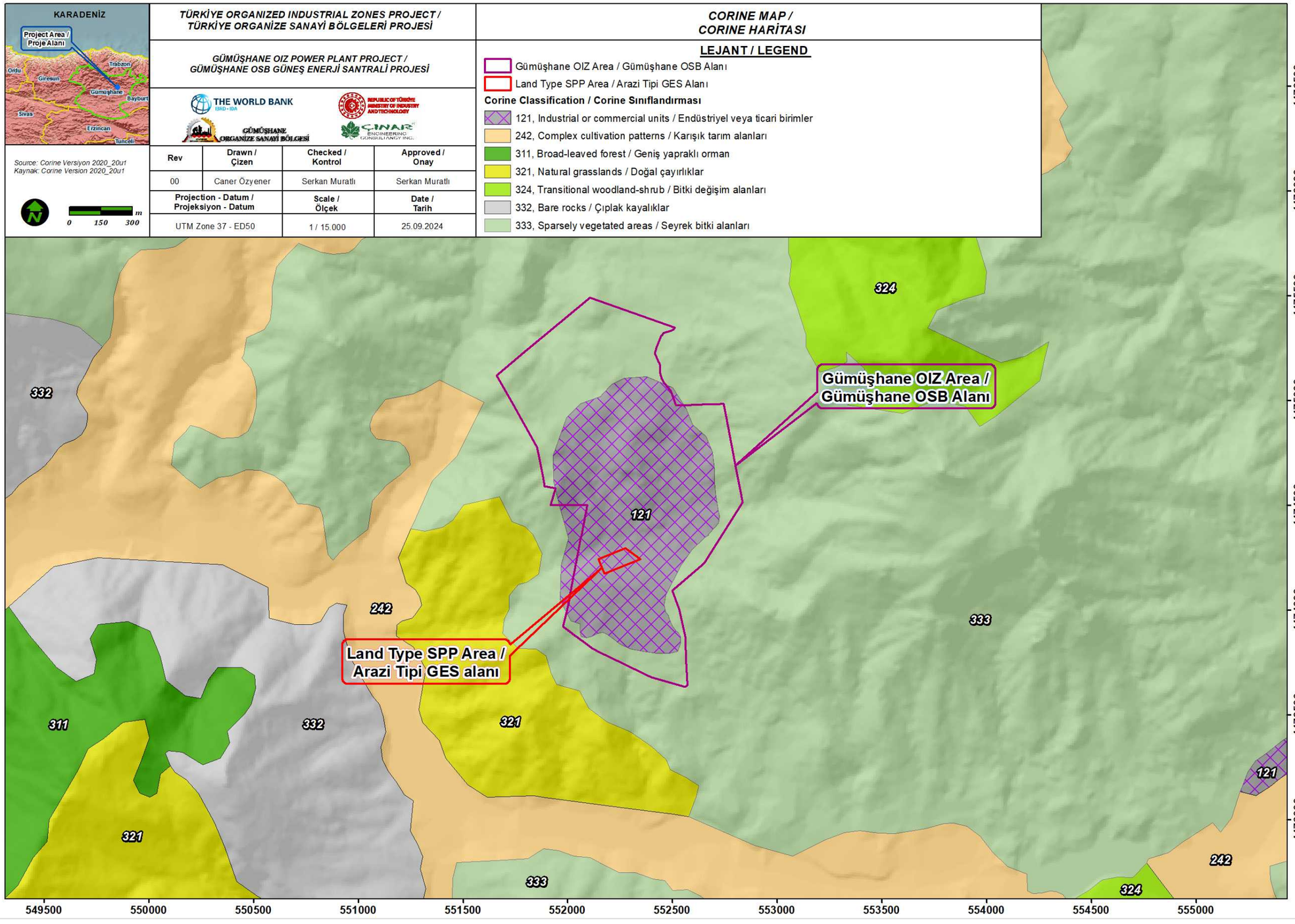

Figure 5. CORINE Map Showing the Project Area

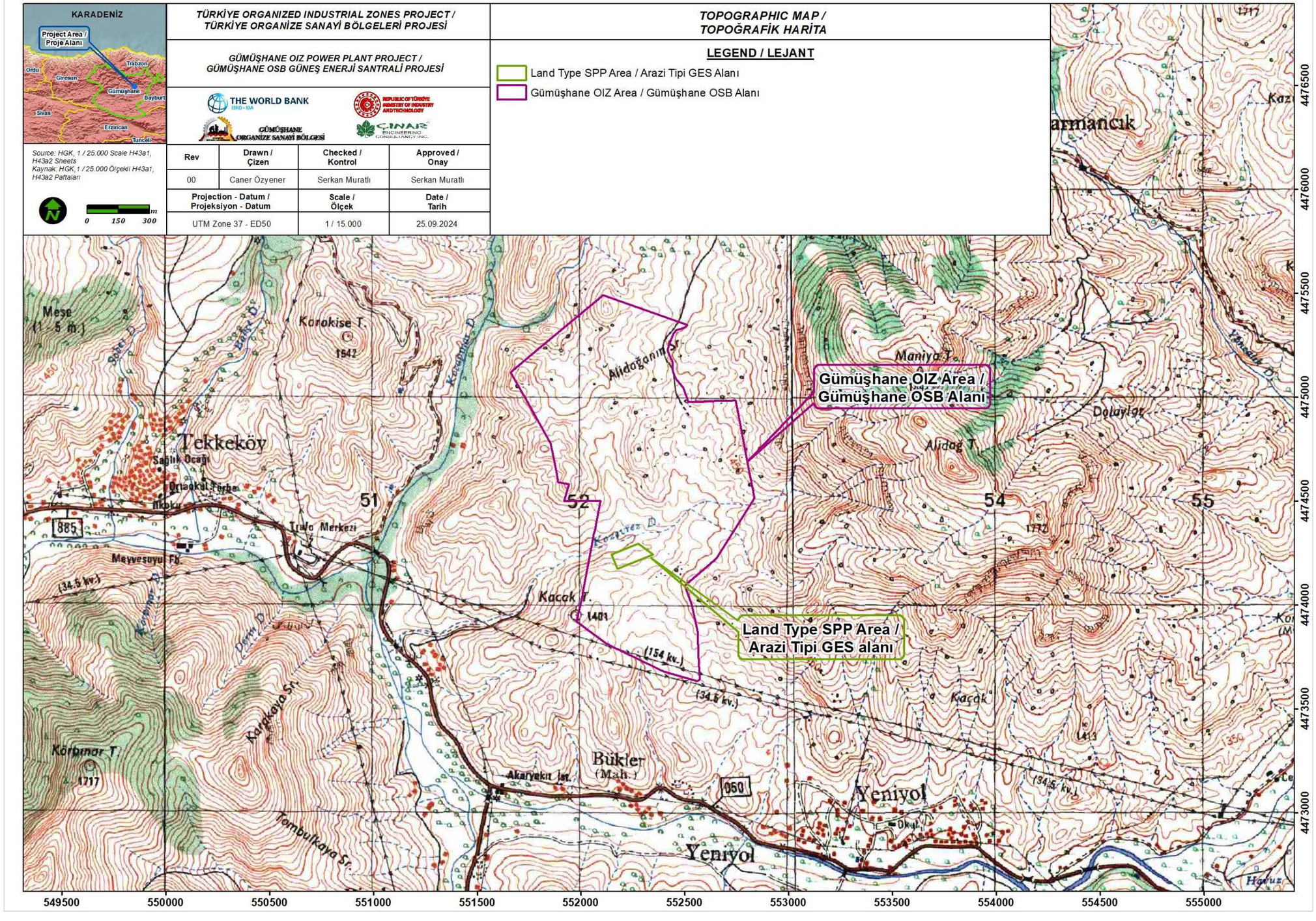

Figure 6. Topographic Map Showing the Project Area

5.3 Geology

Geology of Project Area

The ground of the project area, which is located within the Gümüşhane Organized Industrial Zone, for which a location selection has been made before, forms the Kabaköy formation, which is a Lower-Middle Eocene product that crops out in large areas in the region. Birim Organized Industrial Zone constitutes almost the entire ground. It is seen that there is diversity in the surrounding units, especially in the project area and the western part of the OIZ. The ages of the units, which were shaped under the influence of intense tectonism, range from Lower Jurassic to Quaternary.

There are no protected geological sites or unique geological or geomorphological structures within the project area and its immediate surroundings. The geological units and lithological features in the project area and its surroundings are given below, from oldest to youngest and the geological map is given in Figure 7.

Stratigraphy

Mesozoic

Jura

Kelkit Formation (Jk)

The unit consists of sandstone, sandstone, vegetated sandstone, siliceous shale, siltstone, andesitic and basaltic tuff, agglomerate, red colored limestone containing macro and micro fossils, sandy limestone and a volcano-sedimentary sequence consisting of rocks such as andesite, basalt and diabase.

This typical formation of the Eastern Pontides begins with red, purple, greenish-brown colored, cardboard-like fissured, vegetated sandstones in the Demirözü region. On this level, which is approximately 30-40 meters thick, gradually increasing, greenish-dusky colored, conchoidally weathered, kidney-like-looking marl and tuffite layers are intercalated with sandstone. After a thickness of more than 100 meters, thick-layered, vegetated sandstones, conglomerates consisting of well-rounded basic volcanic rock pebbles, and calcarenites join this alternation, which bears the characteristics of the flysch facies. The tuffites, which increase towards the top, are tempered with basaltic lava and agglomerate in the south of the study area. The unit, whose lithofacies and stacking varies frequently depending on the region, extends from the study area to the west and includes olistostromes composed of limestone pebbles. There is a conglomerate level containing metamorphic rock pebbles at the base of the sequence that overlies the Pulur metamorphics in the south with an angular unconformity. After the coal-lensed, micaceous sandstones overlying these, marl-tuffite-chert-limestone lensed greywacke-shale and chert micrites pass (Akdeniz, 1988).

The thickness of the Kelkit formation varies between approximately 600-1800 meters depending on the weathering condition (Keskin et al., 1991), and it is transitional with the Dikmetaş formation at the bottom and the Kazalı limestone at the top.

As a result of the micropaleontological examination of the samples collected from the limestone member in the unit, an Early Jurassic (Liassic) age was found according to the defined forms. An Early Jurassic (Liassic) age was obtained by identifying macrofossils taken from the Akçakuzu limestone member (Keskin et al., 1989). Akdeniz (2011) gave the Kelkit formation a Liassic-Dogger age due to its stratigraphic position.

Cretaceous

Berdiga Formation (JKb)

The limestone that forms the unit is light gray, grey, off-white in color and consists of oolitic limestone, sandy limestone and chert limestone. They show a distinct layered structure. Layer thicknesses vary between 10 centimeters and 5 meters. Massive limestone is dolomitic

Shows sugar texture. They are poor in terms of micro and macro fossils. Somewhere in the upper levels macro fossils are found. They showed sugar tissue in their microscopic examinations and It is observed that it consists of calcite (spar cement) in the form of microcrystals. It was also found to contain clay minerals, iron oxide and opaque minerals (Kahraman et al., 1986).

The unit conformably overlies the Kelkit formation consisting of volcano-sediments at the bottom. As it comes, it is unconformably overlain by the Mescitli formation.

The age of the unit, which was deposited sometimes in a shallow marine environment and sometimes in an environment close to the coastline (Pelin, 1977), was determined as Late Jurassic-Early Cretaceous based on fossils determined from samples taken from different levels (Kahraman et al., 1986).

Mescitli Formation (Km)

The unit crops out in the east and north of Gümüşhane province, around Pirahmet, Yeniyol villages, Kale sub-district, Sargınkaya village, south of Gökler village, north and west of Balkaynak village, northeast of Kırkpınar village.

The unit consists of sandy limestone, red-burgundy colored clayey limestone, marl, claystone, sandstone and tuffs. It is observed in different colors and the base of the unit consists of sandy limestone level. This is overlain by red clayey limestone. In the upper levels, greenish-gray colored marl, claystone, sandstone and tuff are dominant. The thickness of the layers forming the flysch series varies between 10-30 centimeters.

The unit contains abundant macro and micro fauna. Detected in the samples collected from the formation; According to the fossils, the Santonian-Campanian age was found (Described by: A. Kallioğlu, Kahraman et al., 1986). According to the fossils identified in the samples compiled by Keskin et al. (1989), Campanian-Early Maastrichtian age was found (Described by: K. Erdoğan). Uğuz (2011) determined Turonian-Santonian age (Late Cretaceous) from the fossil assemblage in the unit.

The unit is affected by active volcanism that developed in the Eastern Pontides during the Late Cretaceous period. The area outside the area was initially shallow and turbulent, then gradually deepened over time. It was deposited in a marine environment (Güven, 1998a, b).

Senozoic

Neogene

Miocene

Kabaköy Formation (Tek)

The unit generally consists of andesite, basaltic lava and pyroclastics. Layered in places tuphitic levels are also monitored. Containing abundant Nummulites in areas close to the base levels of the unit limestones and conglomerates are seen.

Andesites, among the volcanics that make up the unit, have a microlithic porphyritic texture and plagioclase phenocrysts (containing albitized, partially sericitized clay minerals) are observed in the rock. The rock paste consists of microlite, albite, epidote, sericite, micro and cryptocrystalline opaque minerals and rare iron oxide. Very rarely, primary quartz microcrystals and amphibole crystals (surrounded by opaque minerals, with partially defined shapes, calcitized) are observed very rarely in andesites (Kahraman et al., 1986). Tuffite consists of a very clastic material. Abundant quartz microcrystals and fragments, plagioclase microcrystals and fragments (partially sericitized, epidotized), rock fragments containing

opaque minerals, epidote, sericite, very abundant glass fragments, widespread epidote and calcite microcrystals, and sparse biotite and muscovite microcrystals are observed. Rock cement consists of materials such as microcrystalline fragments, chlorite, sericite, secondary quartz, and occasionally iron oxide (Described by: O.Türk, A.Sağlam, Kahraman et al., 1986).

As a result of the studies carried out on the fossil content of the unit, whose thickness varies between 800-1500 meters, its age was determined as Early Middle Eocene.

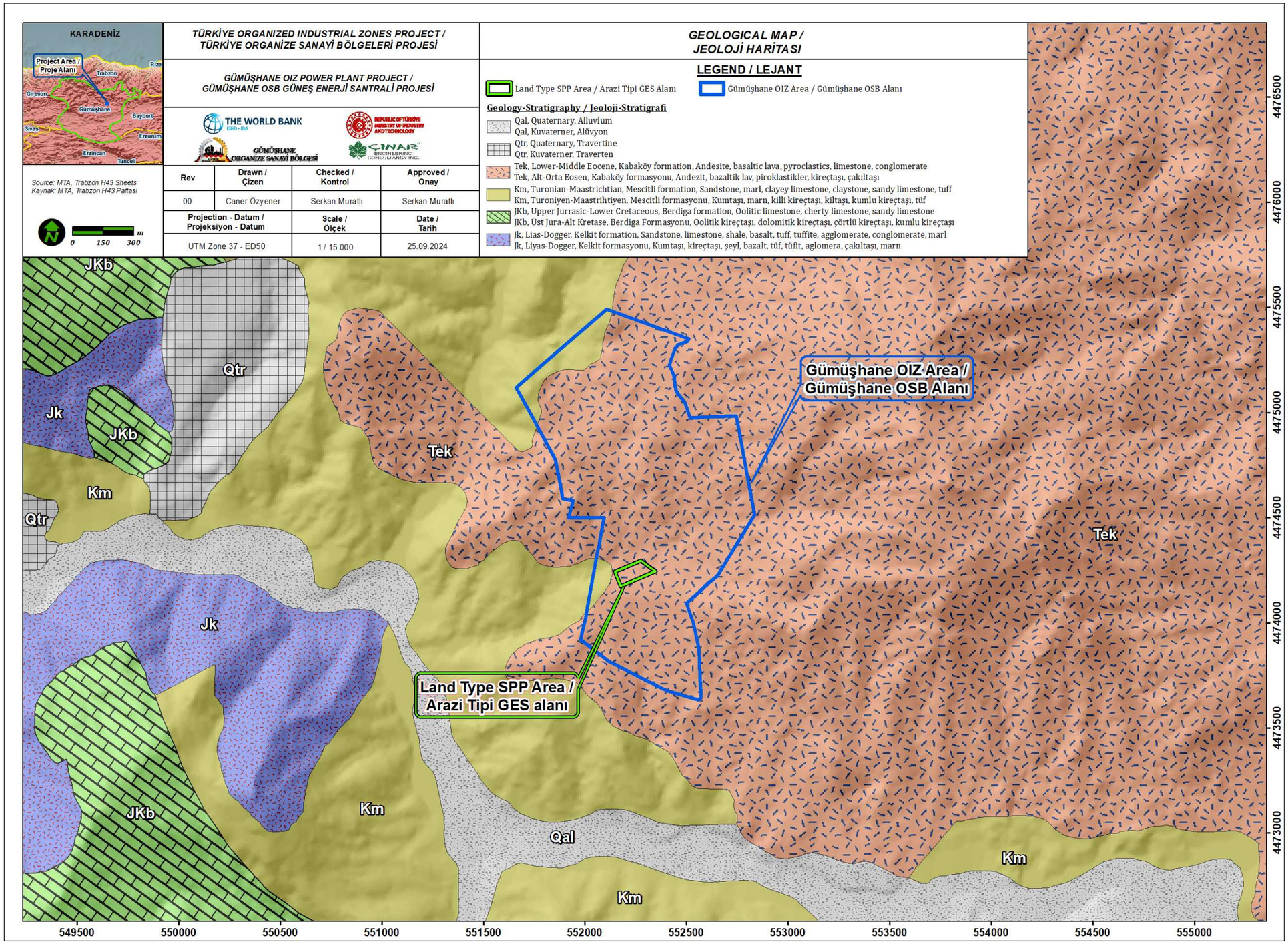

Figure 7. Geological Map of Project Area

5.4 Climate

The Köppen-Geiger map is globally used in climate studies. As shown in Figure 8, Gümüşhane province, where the project area is located, is classified as classified as Csb climate type (warm winter, warm summer, and arid climate) according to the Köppen Climate Classification rules[8]. According to this climate type, the average temperature for at least four months is higher than 10ºC and lower than 22ºC for all months.

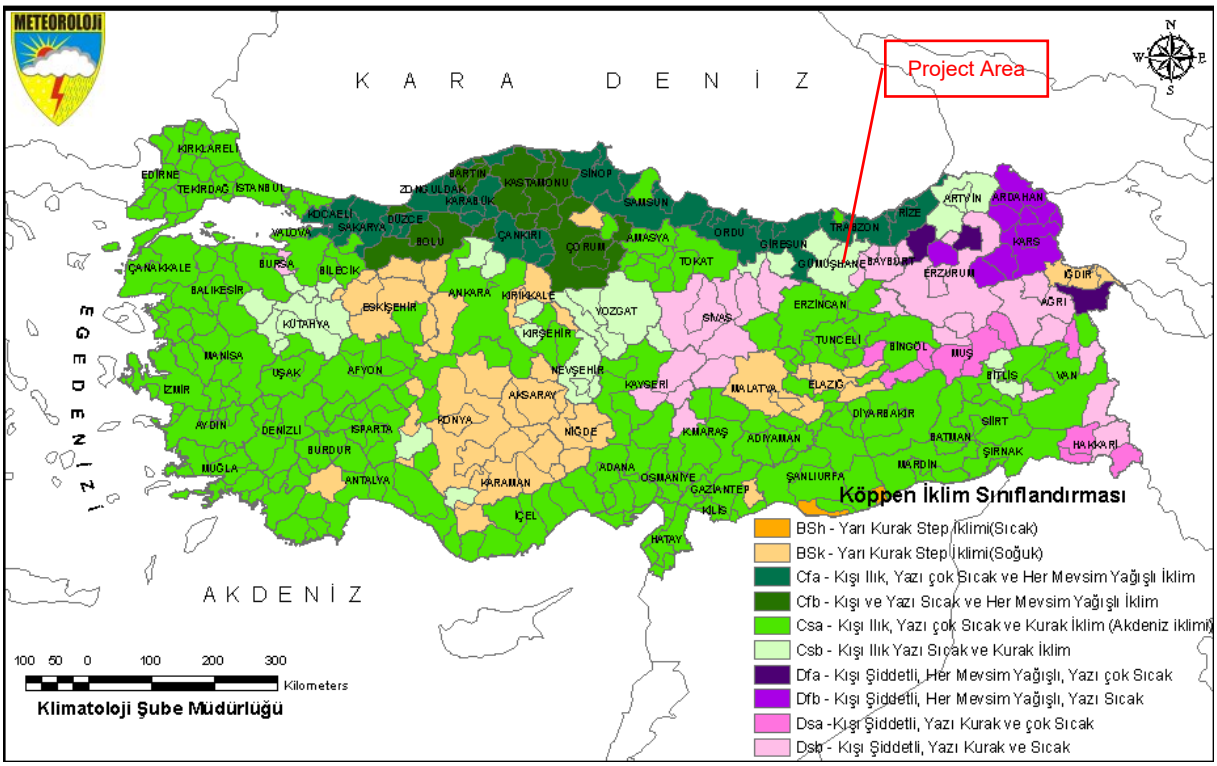

Figure 8. Türkiye's Climate According to Köppen Climate Classification[9]

Gümüşhane province has a low humid continental climate with cold and snowy winters and warm summers. During the peak summer months of July and August, midday temperatures often exceed 28 °C, while summer nights can be quite cool due to the high elevation of Gümüşhane province. In winter, temperatures typically drop to around -10 °C. The region experiences a transition between continental and Eastern Black Sea climates. Zigana Mountain, located to the north, acts as a barrier to the cold, moist northern winds from the Black Sea. Areas in the Eastern Black Sea basin have a warm and humid climate, while the Kelkit region experiences hot, dry summers and cold winters. Precipitation is heaviest in spring and winter[10].

[8] **Source:** MaF, GDoM, Climate of Türkiye According to Köppen Climate Classification, January 2016.Link: https://www.mgm.gov.tr/FILES/iklim/iklim_siniflandirmalari/koppen.pdf
[9] **Source:** https://www.mgm.gov.tr/iklim/iklim-siniflandirmalari.aspx?m=GUMUSHANE
[10] **Source:** https://gumushane.csb.gov.tr/cografi-konum-i-2914

The average annual precipitation is 462.4 mm and average annual number of rainy days is 118.5 in Gümüşhane region between 1961 and 2023.

The annual average temperature in the province is 9.6°C. The highest temperature value is 41.1°C and the lowest temperature is -25.7°C.The hottest month is August, and the coldest month is February.

5.5 Soil Quality

The 142/1 parcel has grass, bushes, *Pinus nigra* (Austrian pine / Black pine) and *Robinia* pseudoacacia (Black locust) (approximately 50 trees) at around 5,000 m^2, and the soil has not been altered. The soil and vegetation on this area will be disturbed due to construction activities.

The remaining part has the package type domestic WWTP, the retaining wall, the water ditch and the remaining 2,500 m^2 is covered with subsoil for land levelling purposes. The soil structure was altered at these parts.

There is no point source soil pollution data for Gümüşhane province within the scope of "Regulation on Soil Pollution Control and Point Source Contaminated Sites in 2022[11].

No pollution was detected through visual inspection during the site visit.

5.6 Air Quality

Gümüşhane OIZ is a “mixed” OIZ with facilities operating in different industrial sectors. In this context, air emissions are generated from existing facilities/business.

In Gümüşhane province, there is one (1) national air quality monitoring stations under the supervision of MoEUCC. The closest air quality monitoring station to the project area is “Gümüşhane Air Quality Monitoring Station (AQMS). The distance of this AQMS to the project area is approximately 11 kilometers as the air distance.

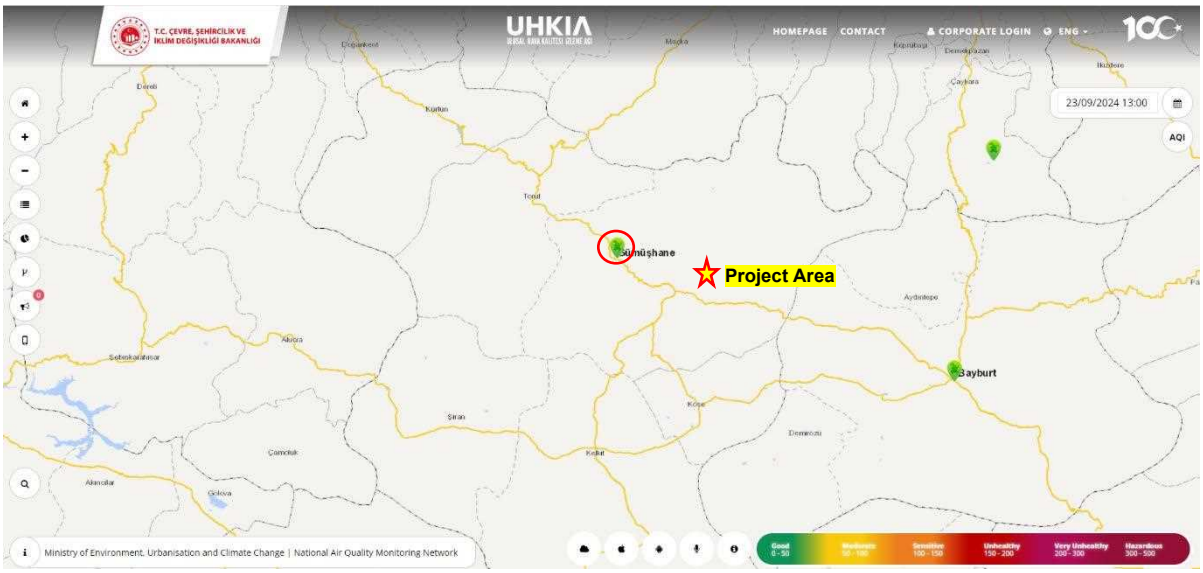

Figure 9. Air Quality Monitoring Station in Gümüşhane Province (23.09.2024)[12]

[11]**Source:** Gümüşhane Provincial State of Environmental Status Report (2022), https://webdosya.csb.gov.tr/db/ced/icerikler/gumushane_-cdr2022-20231013125840.pdf
[12] **Source:** MoEUCC National Air Quality Monitoring Network, https://www.havaizleme.gov.tr/

The current data obtained from the National Air Quality Monitoring Network for Gümüşhane AQMS on 22.09.2024 are given in Table 9. When the data are analyzed, it is seen that the ambient air quality is characterized as "good", and measured parameters comply with national legislation and international standards limit values. The definition of “good” is as follows (according to MoEUCC National Air Quality Monitoring Network): Air quality is good[13].

Table 9. Gümüşhane AQMS Measurement Values (08.09.2024)[14]

Parameter	Analysis Results (µg/m^3)	Project Standard
PM_{10}	41.85	50 (24 Hours Average)
SO_2	4.13	20 (24 Hours Average)
O_3	59.53	100 (8-Hour Daily Maximum)

The excavation works will be short-term during construction phase of the ground-mountedSPP project and it is expected that the construction activities will not have a significant adverse impact on ambient air quality. Due to the short duration of the excavation works, it is foreseen that baseline measurement work will not be necessary in the project impact area.

5.7 Noise

The project area is located within the boundaries of the OIZ. In this context, the potential sources of noise in areas and their vicinity are the production facilities within the OIZ. Since the production activities are mostly conducted in closed facilities, it is thought that there is not a high level of noise in the project area and their vicinities.

The construction of the ground-mounted SPP will take three (3) months. Excavation works will take 4\5 days.

Since the excavation and installation works of the project will be short-term and minor, and considering that the project area is within the boundaries of OIZ, it is considered that no noise baseline measurements are required.

The closest settlement to the SPP project area is Bahçecik Village, located 2.1 km away. No previous complaints related to noise have been received from nearby settlements due to the activities of the Gümüşhane OIZ.

The installation of the solar panels will be done manually in sections. During the fixing of the panels, minor noise may occur due to the use of hand tools. In addition, noise will also be generated during the excavation works. All assessments regarding noise are presented in Section 7.1.7. No noise concerns are expected as there are no sensitive receptors in the project AoI.

5.8 Water Resources and Use

The project area is located in the Eastern Black Sea Basin, one of the water basins allocated throughout Türkiye, within the Gümüşhane OIZ, where a location selection has been made before.

There is no surface water source passing through the SPP area, and the drainage flows within the Gümüşhane OIZ have been rehabilitated and taken under control. The surface water with the closest continuous flow to the SPP area in the region is Kocapınar Creek, which flows at lower elevations approximately 900 m to the northwest, and Harsit Stream, 1.6

[13] **Source:** MoEUCC National Air Quality Monitoring Network, https://www.havaizleme.gov.tr/
[14] **Source:** https://sim.csb.gov.tr/STN/STN_Report/StationDataDownloadNew

km to the southwest. The higher areas where the OIZ is located are drained to lower elevations by streams that flow seasonally to Kocapınar stream and Harşit stream (see Figure 10).

Harşit River: It takes its source from the northern skirts of Vavuk Mountain and is called Sifon Creek (Özey-1990). Flowing towards the north, it passes through Gümüşhane city center and flows into the Black Sea between Tirebolu and Görele. It is observed that Harşit, whose flow rate drops to 3-5 m3/sec in the summer months, overflows from time to time.

The hydrological map of the project area and its surroundings is given in Figure 10.

The water needs of Gümüşhane OIZ are met by two (2) groundwater (caisson) wells. The State Hydraulic Works indicating its no-objection for the use of two (2) wells by the OIZ 12.01.2024 dated and 4239802 numbered is presented in Annex-1.5. Since the proposed sub-project area does not coincide with surface water or groundwater resources as the closest surface water is a tributary Doğankent Stream, 0.92 km northwest and the closest groundwater wells used by OIZ is 1.23 km south, any risks/impacts on surface water and/or groundwater are not foreseen due to the sub-project activities during both installation and operation phases.

Utility water analysis is carried out every three (3) months for control purposes (see Annex-9).

The results of potable water analysis dated 03.07.2024 and comparison of measured parameters with project standards are given in Table 10.

Table 10. Potable Water Analysis Results and Comparison with Project Standards

Parameter	Unit	Result	Project Standards
Enterococcus/Fecal Streptococcus	kob/100mL	0	0/100 ml
Coliform Bacteria	kob/100mL	0	0/100 ml
Escherichia coli	kob/100mL	0	0/100 ml
Conductivity	20°C, mS/m	583	2500
pH	pH Unit	7.38	≤ 9,5-6,5≤
Ammonium	mg/l	Not detected.	0.50
Odor	-	Appropriate.	Acceptable by consumers and no abnormal changes.
Turbidity	NTU	Appropriate.	Acceptable by consumers and no abnormal changes.
Color	-	Appropriate	Acceptable by consumers and no abnormal changes.

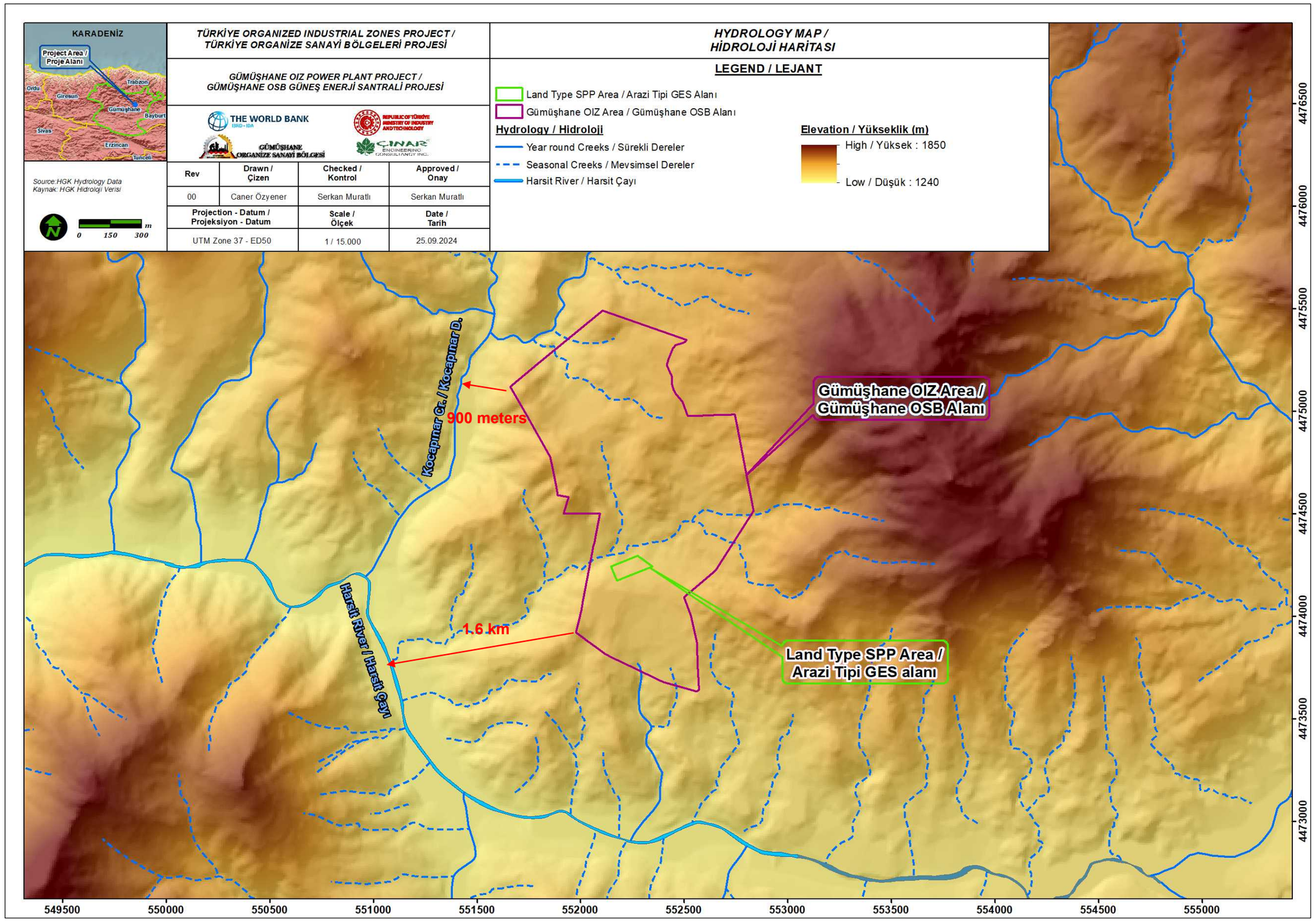

Figure 10. Hydrological Map of Project Area and Its Surrounding

5.9 Wastewater Management

Gümüşhane OIZ has a package type domestic biological wastewater treatment plant with 100 m^3/day capacity to treat the domestic wastewater collected from the OIZ. The plant was established in 2013.

The WWTP is evaluated within the scope of Annex-2 list Article 10.2 "Urban and/or domestic wastewater treatment plants with a capacity of less than 20,000 m^3/day[1,2] of the Environmental Permit and License Regulation Annex-1 list, which entered into force after being published in the Official Gazette dated 10.09.2014 and numbered 29115.

Gümüşhane OIZ is required to obtain an Environmental Permit from the Provincial Directorate of Environmental, Urbanization and Climate Change. OIZ Directorate declared that the Wastewater Treatment Plant is in operation. The domestic wastewater collected from the OIZ has been discharged to the Doğankent (Harşit) Stream (seasonal) with treatment (see Annex-1.11). With an official letter dated 11.12.2023, Gümüşhane OIZ requested information on the Provincial Directorate's eligibility process. (see Annex-1.12). In this context, it is essential to obtain the environmental permit urgently. Gümüşhane OIZ applied to the Provincial Directorate of Environment, Urbanization and Climate Change on 28.11.2023 via the online system to obtain an “Eligibility Letter” (see Annex-1.7). This letter is one of the documents that must be submitted to start the Environmental Permit application process. It has been stated by the OIZ authorities that the environmental permit process is ongoing.

Process workflow scheme of the WWTP is shown in Figure 11 and Annex-8.

Gümüşhane OIZ applied to the Provincial Directorate of Environment, Urbanization and Climate Change on 28.11.2023 via the online system to obtain a “Eligibility Letter”. This letter is one of the documents that must be submitted to start the Environmental Permit application process.

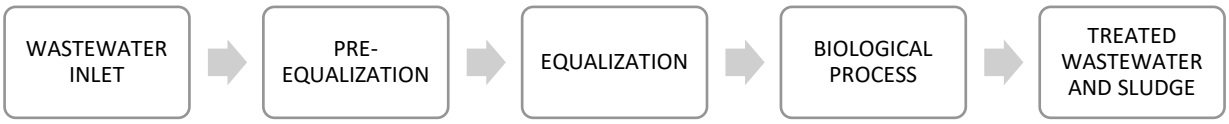

Figure 11. Process Workflow Scheme of WWTP

It has been declared by OIZ authorities that no wastewater analysis is performed within the scope of Gümüşhane OIZ.

5.10 Waste Management

As stated in Annex-1 of the Zero Waste Regulation published in the Official Gazette dated 12.07.2019 and numbered 30829, OIZs are obliged to establish a zero-waste management system.

In this context, Gümüşhane OIZ has a "Zero Waste Certificate (Basic Level)" valid between 29.07.2021-29.07.2026 (see Annex-1.10). In line with the zero-waste management system, there are waste boxes in the OIZ administrative building (see Annex-5).

The enterprises/facilities within Gümüşhane OIZ carry out their own waste management. There is a temporary non-hazardous waste storage area belonging to Gümüşhane OIZ for the storage of wastes generated by OIZ administrative units (see Annex-5). Since the OIZ is listed in Annex-2 of the Environmental Permit and License Regulation (due to WWTP), it is

sufficient to prepare an Industrial Waste Management Plan for this area. Since it is in Annex-2 list, there is no need for Provincial Directorate of Environment, Urbanization and Climate Change approval[15]. According to the information received from the OIZ Management, an Industrial Waste Management Plan has not been prepared yet. OIZ must prepare an Industrial Waste Management Plan.

The floor of the temporary waste storage area is impermeable concrete floor, closed on four sides. Ventilation is available in the area. Containers are labeled according to waste type. There are no containers placed for hazardous waste in the area. There is no fire extinguisher in the waste storage area. Fire extinguishers should be positioned in the area against the fire risk. During the site visit, it was observed that nonhazardous wastes are stored here. As per the Waste Management Regulation, non-hazardous waste should be delivered once a year. It was declared by the OIZ authorities that no waste has been delivered until now. Measures to be taken to improve the waste storage area are given below and in Section 8.

- A storage area for hazardous waste should be established or hazardous waste containers should be placed in the existing area, separate from other wastes.
- A fire extinguisher must be placed in the waste storage area.
- Waste deliveries must be made in accordance with the time periods specified in national legislation (once a year for non-hazardous waste, once every 6 months for hazardous waste).

The Special Provincial Administration collects domestic solid waste, and licensed private firms collect other types of waste (i.e., hazardous, recyclable) that are required to be collected by licensed private firms.

Waste management system of the OIZ is not sufficient to manage the waste to be generated due to the project.

5.11 Natural Disaster Potential

Gümüşhane is a province with high disaster diversity, and the northern parts are affected by rockfalls, landslides and avalanches, while the southern parts are mostly affected by floods and earthquake disasters. The main reasons for this situation can be listed as rough terrain (slope, altitude, etc.), meteorological conditions (wind, freeze-thaw, precipitation, lightning, etc.) and human effects (excavation, blasting, etc.). Gümüşhane Province is among the top 20 provinces in the country in terms of the number of disaster incidents (Gümüşhane Provincial Disaster Risk Reduction Plan, Provincial Disaster Risk Reduction Plan, Disaster and Emergency Management Presidency (AFAD), 2021).

In order to examine the status of mass movements in and around the project area, it was examined with the help of MTA General Directorate Earth Sciences Map Viewer (http://yerbilimleri.mta.gov.tr). Accordingly, the closest old landslide area to the planned SPP area is 2.4 km to the southeast.

[15] https://cygm.csb.gov.tr/atik-yonetim-planlari-hakkinda-duyuru-duyuru-436679

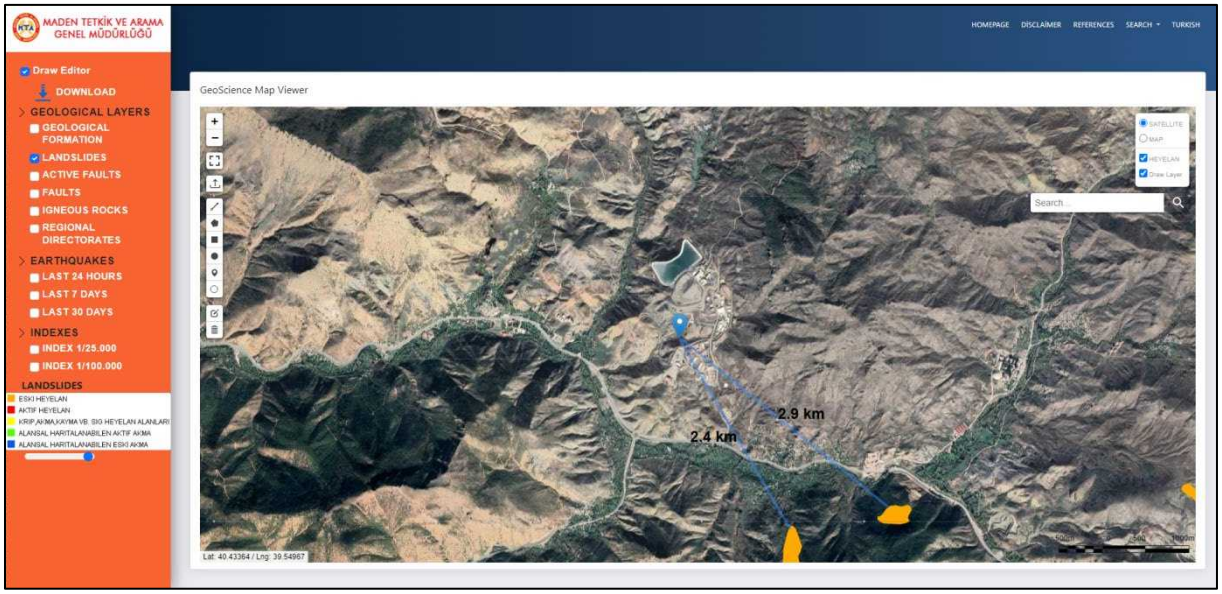

Figure 12. Landslide Status of the Project Area and Surroundings[16]

Due to the high altitude and slope parameters in the north-east and west of Gümüşhane Province, these parts of the province constitute a source area for avalanches and are affected by avalanche events. In the avalanche incident that occurred in Köstere Village of Torul District in the north of the province in 2009, 10 climbers died after being trapped in the avalanche and 7 climbers were rescued with injuries.

Since the slope in the southern parts of Gümüşhane Province is low and areas close to the edges of the stream bed are generally preferred as settlements, these parts are affected by floods and slope floods.

Seismicity

In terms of seismicity; There are no fault lines with high activity directly in the Gümüşhane region. However, major earthquakes that may occur on the North Anatolian Fault, which passes approximately 80 km south of the province and has a high earthquake-producing potential, will cause tremors in the region. These tremors may cause damage, especially to high-rise buildings built on alluviums in stream beds. In Türkiye's earthquake hazard map prepared by Disaster and Emergency Management Presidency (AFAD) as of 2018 (see Figure 13), Gümüşhane city center is low dangerous according to acceleration records, while Köse, Şiran and Kelkit, close to the North Anatolian Fault zone, are the districts are located in medium and high-risk areas.

[16] **Source:** http://yerbilimleri.mta.gov.tr/home.aspx

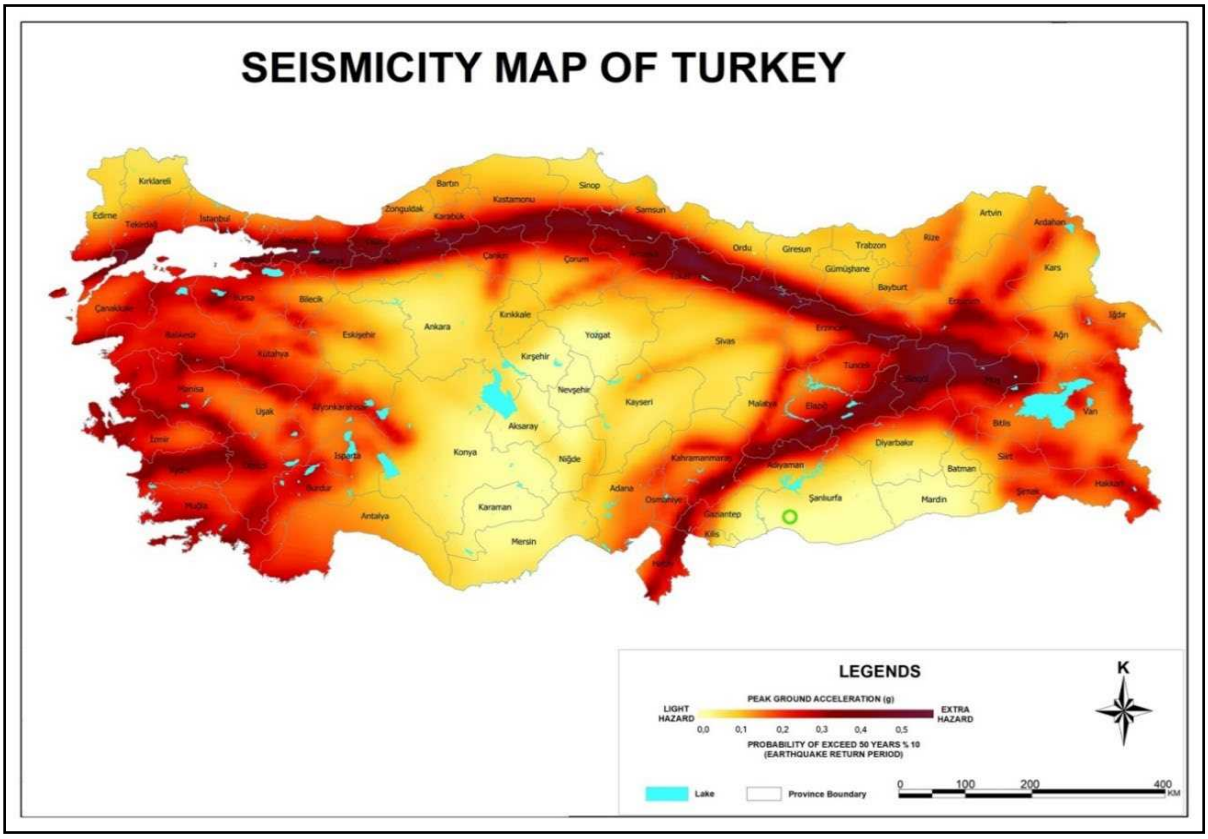

Figure 13. Earthquake Hazard Map of Türkiye[17]

The project area was examined on the interactive earthquake hazard map published by AFAD, and the largest ground acceleration value (PGA 475) for the 475 Year Recurrence Period was determined as 0.186 g (see Figure 14).

[17] **Source:** AFAD, 2018, Türkiye Earhquake Hazard Map

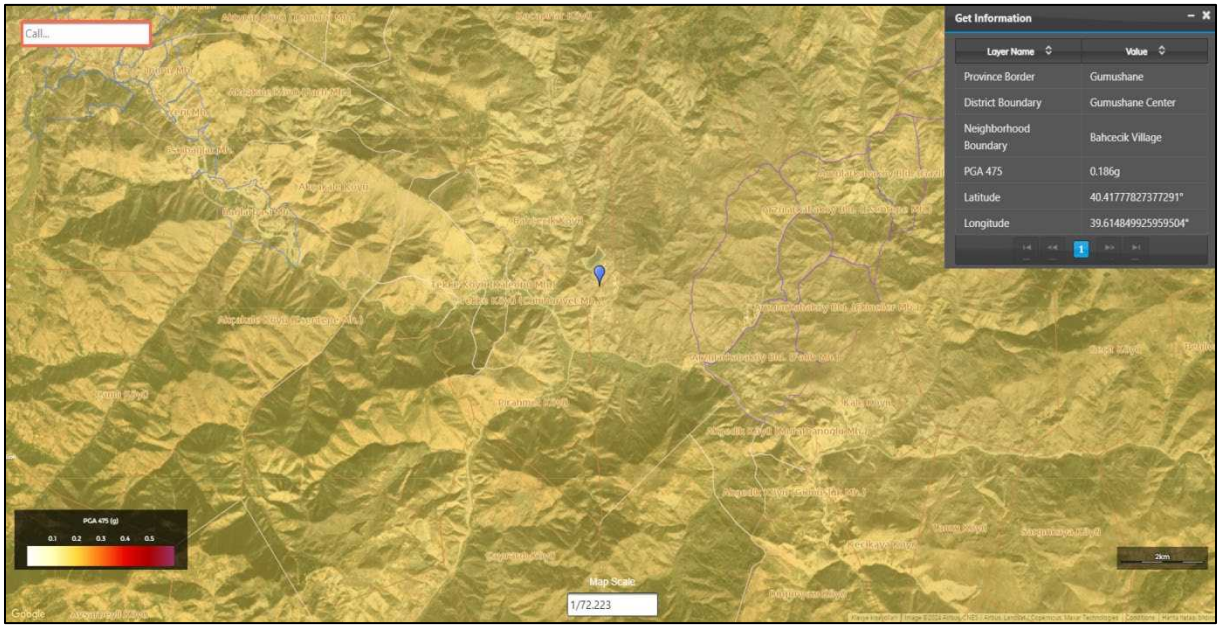

Figure 14. Peak ground acceleration in the project area for a recurrence period of 475 years[18]

In the March 13, 1992 M=6.8 Erzincan earthquake, 6 citizens lost their lives in Gümüşhane Province and 101 houses were damaged by landslides, rockfalls, avalanches, etc. Damages occurred due to various reasons. The last earthquake with a magnitude of 1.6 ML occurred in Gümüşhane Province, 0.57 km away from Gürleyik Village in Kelkit District, at a depth of 17.68 km. The 1939 Erzincan earthquake, which occurred on the North Anatolian Fault Zone, affected the settlements in the Kelkit valley and caused loss of life and property.

5.12 Biodiversity and Protected Areas

The topics covered under the biological environment are the nationally protected areas and internationally recognized areas, habitat classification, terrestrial flora and fauna, and critical habitat assessment.

Methodology for Biological Environment

Data Collection

The baseline data for the biological environment of the project area and project AoI are gathered from previously published scientific work, literature information on habitats and species, field surveys and expert judgement. The ecological study was conducted with the following objectives:

- Using various standard techniques, assess the status of major floral and faunal components of all terrestrial habitats present in the Project AoI;
- Data collection and compilation on the status of floral and faunal components and habitats;
- Provide quantitative data on various floral and faunal components.
- Identification and listing of floral and faunal species of conservation significant (Critically endangered (CR), Endangered (EN), Vulnerable (VU) and threatened and endemic species in accordance with the International Union of Conservation for Nature (IUCN) RED List) in the Project AoI; and

[18] **Source:** https://tdth.afad.gov.tr/TDTH/main.xhtml

- Identification of conservation-sensitive areas (Protect Areas: National Parks, Nature Parks, Nature Reserves, Wildlife Development Area, Special Environmental Protection Area, Wetlands, Biosphere Reserves) in the Project AoI.

Some of the general methodologies for field surveys can be listed as the following:

- In determining vantage points, locations that represent different habitat types and those that had been identified to be significant to species were considered.
- Some of the flora and fauna species were recorded through direct observations (between Photograph 5 and Photograph 10).

Field surveys were conducted in July 2024.

Area of Influence (AoI) for Biological Environment

The Area of Influence (AoI) for the biological environment is defined as the boundary of the organized industrial zone (OIZ) within which the project area is entirely located. This designation was chosen to align with the existing management and zoning practices of the OIZ, ensuring that potential environmental impacts are assessed within the zone's established limits. (see Figure 15).

The specific range of the AoI (in meters) was determined based on the extent of the OIZ's boundary, reflecting the direct and indirect influence the project may have on the biological environment. This approach considers factors such as the containment of industrial activities within the OIZ, the lack of immediate biological sensitivity beyond its borders, and the intention to minimize unnecessary overlap with surrounding areas. By defining the AoI in this way, the assessment focuses on the most relevant area for environmental monitoring and mitigation.

The Project area includes approximately 50 trees including *Pinus nigra* and *Robinia pseudoacacia*. If possible, the trees should be re-located before construction.

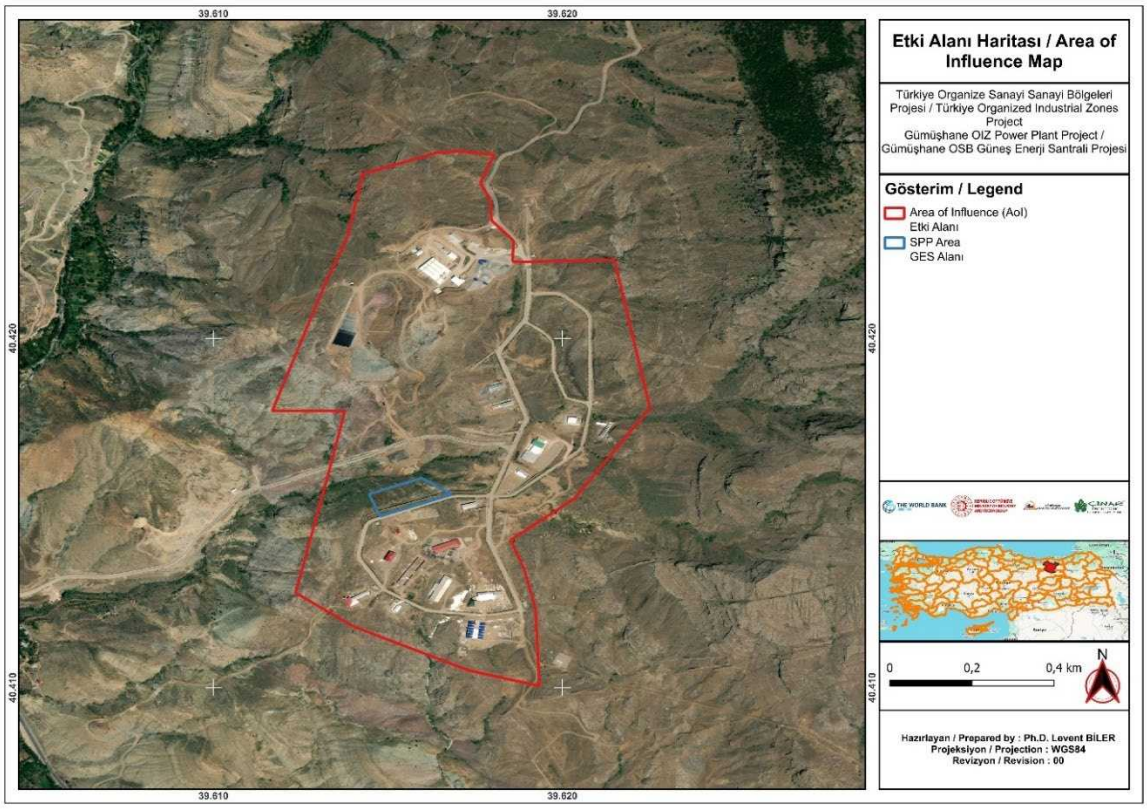

Figure 15. Area of Influence Map

Habitat Classification

The European Nature Information System (EUNIS) puts forward a system for identification and classification of European habitat types. Classification area is quite large including the entire European mainland and seas including islands that are close to the mainland (except for Cyprus, Iceland and Greenland), EU states' archipelagos (Canary Islands, Madeira Islands and Azore Islands) and the European mainland to the west of Ural Mountains that cover Türkiye and the Caucasus. The main objective of the EUNIS habitat classification is to create a European reference set of habitat types including a description of all types and hierarchical classification.

Habitats within the project AoI are evaluated in accordance with the EUNIS classification, which is useful in terms of not only relating the national classifications to international level, but in terms of corresponding EUNIS habitats to habitats listed in Annex I of Habitats Directive for "designation of special areas of conservation" and the European Red List of Habitats for the critical habitat assessment.

The habitat types at the project area and AoI are "J1.4 Urban and suburban industrial and commercial sites still in active use" and "V6 Tree dominated man-made habitats", which are modified habitat, and "E1 Dry grasslands", which is a natural habitat.

Terrestrial Flora

Plant species, which are identified in the SPP areas and AoI are given in between Photograph 5 and Photograph 7. 36 plant species were identified. Eight (8) species were listed as "LC" and 28 species "NE" according to the IUCN. None of the identified species were endemic and rare.

Photograph 5. ***Melilotus officinalis***

Photograph 6. ***Echium vulgare***

Photograph 7. ***Teucrium orientale***

Terrestrial Fauna

Due to the presence of intense human activity and traffic, only bird and mammal species could be identified among the fauna species. However, based on the results of literature searches, the following species that may occur in the area are listed below. Some of the observed species in the SPP areas and AoI are given in between Photograph 8 and Photograph 10.

According to the surveys and literature research two (2) amphibian, six (6) reptiles, 29 birds, and 10 mammal species were identified. *Streptopelia turtur*[19] is listed as "VU", the other species were not under threat and in any threatened category according to the IUCN (see Table 12). *Streptopelia turtur* will not be affected by the project. The site is located within an established industrial zone and does not offer suitable habitat for the species. No individuals were recorded during field surveys, and the area is not part of any known migratory route or congregation site.

Photograph 8. *Lepus europaeus* (European Hare)

[19] After thorough evaluation in the Critical Habitat section, it has been confirmed that *Streptopelia turtur* will not be affected by the project; hence, no specific mitigation measures have been deemed necessary for this species.

Photograph 9. *Motacilla alba* (White Wagtail)

Photograph 10. *Hieraaetus pennatus* (Booted Eagle)

Table 11. Flora species in the AoI

Familya	Species	Türkish Name	Common Name	Endemism	IUCN	CITES	BERN	Obs./Lit.
Apiaceae	*Ammi visnaga*	Hıltan	Khella	-	LC	-	-	Site Obs.+Lit.
Apiaceae	*Eryngium giganteum*	Boğadikeni	Miss Willmott's ghost	-	NE	-	-	Lit.
Araceae	*Spirodela polyrrhiza*	Telli Sumercimeği	Greater duckweed	-	NE	-	-	Lit.
Asteraceae	*Anthemis cretica subsp. umbilicate*	Babunç	-	-	NE	-	-	Lit.
Asteraceae	*Carduus adpressus*	Tomara	-	-	NE	-	-	Site Obs.+Lit.
Asteraceae	*Cichorium intybus*	Hindiba	Chicory	-	LC	-	-	Site Obs.+Lit.
Asteraceae	*Erigeron nigromontanus*	Tarla Şifaotu	-	-	NE	-	-	Lit.
Asteraceae	*Taraxacum poliochlorum*	Kızıl Hindiba	-	-	NE	-	-	Lit.
Asteraceae	*Xeranthemum annuum*	Kâğıtçiçeği	-	-	NE	-	-	Lit.
Berberidaceae	*Epimedium pubigerum*	Tekeotu	-	-	NE	-	-	Site Obs.+Lit.
Boraginaceae	*Anchusa azurea*	Sığırdili	Italian alkanet	-	NE	-	-	Site Obs.+Lit.
Boraginaceae	*Echium vulgare*	Engerek Otu	Viper's-bugloss	-	NE	-	-	Site Obs.+Lit.
Brassicaceae	*Draba polytricha*	Rize Dolaması	-	-	NE	-	-	Lit.
Brassicaceae	*Erysimum szowitsianum*	Çar Zarifesi	-	-	NE	-	-	Site Obs.+Lit.
Caprifoliaceae	*Cephalaria aristate*	Çoruh Pelemiri	-	-	NE	-	-	Lit.
Caprifoliaceae	*Cephalaria syriaca*	Pelemir	Syrian cephalaria	-	NE	-	-	Site Obs.+Lit.
Caryophyllaceae	*Dianthus carthusianorum*	Dağ Karanfili	-	-	NE	-	-	Lit.
Crassulaceae	*Umbilicus rupestris*	Göbekotu	Navelwort	-	NE	-	-	Lit.
Euphorbiaceae	*Euphorbia petrophila*	Taş Sütleğeni	-	-	NE	-	-	Lit.
Fabaceae	*Astragalus adzharicus*	Acara Geveni	-	-	NE	-	-	Site Obs.+Lit.
Fabaceae	*Melilotus officinalis*	Kokulu Yonca	Yellow sweet clover	-	LC	-	-	Site Obs.+Lit.
Fabaceae	*Onobrychis montana*	Dağ Korungası	Mountain sainfoin	-	NE	-	-	Lit.
Fabaceae	*Robinia pseudoacacia*	Yalancı Akasya	Black locust	-	LC	-	-	Site Obs.+Lit.
Fabaceae	*Vicia dadianorum*	Çayır Fiği	-	-	NE	-	-	Lit.
Hypericaceae	*Hypericum perforatum*	Kantaron	Perforate St John's-wort	-	LC	-	-	Site Obs.+Lit.
Lamiaceae	*Salvia aethiopis*	Habeş Adaçayı	Mediterranean sage	-	NE	-	-	Lit.
Lamiaceae	*Teucrium orientale*	Kirveotu	-	-	NE	-	-	Lit.
Lamiaceae	*Thymus pubescens*	Tüylü Kekik	-	-	NE	-	-	Lit.
Onagraceae	*Epilobium anagallidifolium*	Yayla Yakısı	-	-	NE	-	-	Lit.
Papaveraceae	*Fumaria asepala*	Ak Şahtere	-	-	NE	-	-	Lit.
Papaveraceae	*Fumaria officinalis*	Şahtere	Common fumitory	-	LC	-	-	Lit.
Pinaceae	*Pinus nigra*	Sarıçam	Austrian pine / Black pine	-	LC	-	-	Site Obs.+Lit.
Plumbaginaceae	*Acantholimon puberulum*	Çobanyastığı	-	-	NE	-	-	Lit.
Rosaceae	*Rosa canina*	Kuşburnu	Dog-rose	-	LC	-	-	Site Obs.+Lit.
Rosaceae	*Rubus sanctus*	Böğürtlen	Holy bramble	-	NE	-	-	Site Obs.+Lit.
Solanaecae	*Atropa belladonna*	Güzelavratotu	Deadly nightshade	-	NE	-	-	Lit.

Table 12. Fauna species at the Project Area

Class	Family	Species	Türkish Name	Common Name	Endemism	IUCN	CITES	BERN	Hunting Law	Status	RDB	Obs./Lit.
Amphibia	Bufonidae	*Bufo bufo*	Siğilli Kurbağa	Common Toad	-	LC	-	Ann-III	-	-	-	Lit.
Amphibia	Ranidae	*Pelophylax ridibundus*	Ova Kurbağası, Bataklık Kurbağası	Euroasian Marsh Frog, Marsh Frog	-	LC	-	Ann-III	-	-	-	Lit.
Reptilia	Colubridae	*Dolichophis caspius*	Hazer Yılanı	Caspian Whipsnake	-	LC	-	Ann-III	-	-	-	Lit.
Reptilia	Colubridae	*Eirenis modestus*	Uysal Yılan	Anatolian Dwarf Racer	-	LC	-	Ann-III	-	-	-	Lit.
Reptilia	Lacertidae	*Lacerta media*	Doğu Yeşil Kertenkelesi, Ortanca Yeşil Kertenkele	Levant Green Lizard, Medium-Sized Green Lizard	-	LC	-	Ann-III	-	-	-	Site Obs.+Lit.
Reptilia	Lacertidae	*Darevskia rudis*	Trabzon Kertenkelesi	Spiny-Tailed Lizard	-	LC	-	Ann-III	-	-	-	Lit.
Reptilia	Lacertidae	*Ophisops elegans*	Tarla Kertenkelesi, Yılan Gözlü Kertenkele	Snake-Eyed Lizard	-	NE	-	Ann-II	-	-	-	Site Obs.+Lit.
Reptilia	Natricidae	*Natrix natrix*	Yarı Sucul Yılan, Küpeli Yılan	Grass Snake	-	LC	-	Ann-III	-	-	-	Lit.
Aves	Accipitridae	*Hieraaetus pennatus*	Küçük Kartal	Booted Eagle	-	LC	II	Ann-III	-	Local	A.3	Site Obs.+Lit.
Aves	Accipitridae	*Buteo rufinus*	Kızıl Şahin	Long-Legged Buzzard	-	LC	II	Ann-III	-	Local	A.3	Site Obs.+Lit.
Aves	Accipitridae	*Buteo buteo*	Şahin	Eurasian Buzzard	-	LC	II	Ann-III	-	Local	A.3	Lit.
Aves	Accipitridae	*Accipiter nisus*	Atmaca	Eurasian Sparrowhawk	-	LC	II	Ann-III	-	Local	A.3	Lit.
Aves	Alaudidae	*Alauda arvensis*	Tarlakuşu	Eurasian Skylark	-	LC	-	Ann-III	Ann-I	Winter visitor	A.4	Lit.
Aves	Alaudidae	*Calandrella brachydactyla*	Bozkır Toygarı	Greater Short-Toed Lark	-	LC	-	Ann-II	-	Local	A.3	Lit.
Aves	Columbidae	*Columba livia*	Kaya Güvercini	Rock Dove	-	LC	-	Ann-III	Ann-II	Local	A.5	Site Obs.+Lit.
Aves	Columbidae	*Streptopelia turtur*	Üveyik	European Turtle-Dove	-	VU	-	Ann-III	Ann-II	Summer visitor	A.3.1	Lit.
Aves	Columbidae	*Streptopelia decaocto*	Kumru	Eurasian Collared-Dove	-	LC	-	Ann-III	Ann-I	Local	A.5	Lit.
Aves	Corvidae	*Pica pica*	Saksağan	Eurasian Magpie	-	LC	-	-	Ann-II	Local	A.5	Site Obs.+Lit.
Aves	Corvidae	*Corvus corax*	Kuzgun	Common Raven	-	LC	-	Ann-III	Ann-I	Local	A.5	Lit.
Aves	Emberizidae	*Emberiza cia*	Kaya Çintesi	Rock Bunting	-	LC	-	Ann-II	-	Summer visitor	A.2	Lit.
Aves	Falconidae	*Falco tinnunculus*	Kerkenez	Common Kestrel	-	LC	II	Ann-II	-	Local	A.2	Lit.
Aves	Fringillidae	*Carduelis carduelis*	Saka	European Goldfinch	-	LC	-	Ann-II	-	Local	A.3.1	Lit.
Aves	Fringillidae	*Fringilla montifringilla*	Dağ İspinozu	Brambling	-	LC	-	Ann-III	Ann-I	Local	A.3	Lit.
Aves	Hirundinidae	*Hirundo rustica*	Kır Kırlangıcı	Barn Swallow	-	LC	-	Ann-II	-	Summer visitor	A.5	Site Obs.+Lit.
Aves	Hirundinidae	*Delichon urbicum*	Ev Kırlangıcı	Northern House Martin	-	LC	-	Ann-II	-	Summer visitor	A.3	Site Obs.+Lit.
Aves	Laniidae	*Lanius collurio*	Kızılsırtlı Örümcekkuşu	Red-Backed Shrike	-	LC	-	Ann-II	Ann-I	Summer visitor	A.3	Lit.
Aves	Laniidae	*Lanius minor*	Karaalınlı Örümcekkuşu	Lesser Grey Shrike	-	LC	-	Ann-II	-	Transit	A.3	Lit.
Aves	Motacillidae	*Motacilla cinerea*	Dağ Kuyruksallayanı	Grey Wagtail	-	LC	-	Ann-II	-	Winter visitor	A.2	Lit.
Aves	Motacillidae	*Motacilla alba*	Akkuyruksallayan	White Wagtail	-	LC	-	Ann-II	-	Local	A.3.1	Site Obs.+Lit.
Aves	Muscicapidae	*Oenanthe hispanica*	Karakulaklı Kuyrukkakan	Black-Eared Wheatear	-	LC	-	Ann-II	-	Summer visitor	A.2	Lit.
Aves	Muscicapidae	*Oenanthe Oenanthe*	Kuyrukkakan	Northern Wheatear	-	LC	-	Ann-II	Ann-I	Transit	A.3	Site Obs.+Lit.
Aves	Muscicapidae	*Saxicola rubetra*	Çayır Taşkuşu	Whinchat	-	LC	-	Ann-II	-	Transit	A.3	Lit.
Aves	Passeridae	*Passer domesticus*	Serçe	House Sparrow	-	LC	-	-	Ann-II	Local	A.5	Site Obs.+Lit.
Aves	Passeridae	*Petronia petronia*	Kaya Serçesi	Rock Sparrow	-	LC	-	Ann-II	-	Local	A.3	Lit.
Aves	Sittidae	*Sitta neumayer*	Kaya Sıvacısı	Western Rock Nuthatch	-	LC	-	Ann-II	-	Local	A.2	Lit.
Aves	Strigidae	*Athene Noctua*	Kukumav	Little Owl	-	LC	II	Ann-II	-	Local	A.2	Lit.
Aves	Upupidae	*Upupa epops*	İbibik	Common Hoopoe	-	LC	-	Ann-II	-	Summer visitor	A.2	Lit.
Mammalia	Canidae	*Vulpes vulpes*	Kızıl Tilki	Red Fox	-	LC	-	-	Ann-II	-	-	Lit.
Mammalia	Canidae	*Canis aureus*	Çakal	Golden Jackal	-	LC	III	-	Ann-II	-	-	Lit.

Class	Family	Species	Türkish Name	Common Name	Endemism	IUCN	CITES	BERN	Hunting Law	Status	RDB	Obs./Lit.
Mammalia	Dipodidae	*Scarturus williamsi*	Araptavşanı	Williams Jerboa	-	LC	-	-	-	-	-	Lit.
Mammalia	Felidae	*Felis silvestris*	Yaban Kedisi	Wild Cat	-	LC	II	Ann-II	-	-	-	Lit.
Mammalia	Leporidae	*Lepus europaeus*	Yabani Tavşan	European Hare	-	LC	-	Ann-III	Ann-II	-	-	Site Obs.+Lit.
Mammalia	Muridae	*Mus musculus*	Ev Faresi	House Mouse	-	LC	-	-	-	-	-	Lit.
Mammalia	Muridae	*Rattus rattus*	Sıçan	House Rat	-	LC	-	-	-	-	-	Lit.
Mammalia	Suidae	*Sus scrofa*	Yabandomuzu	Wild Boar	-	LC	-	-	Ann-II	-	-	Lit.
Mammalia	Ursidae	*Ursus arctos*	Bozayı	Brown Bear	-	LC	I/II	Ann-II	-	-	-	Lit.
Mammalia	Vespertilionidae	*Pipistrellus pipistrellus*	Bayağı Cüce Yarasa	Common Pipistrelle	-	LC	-	Ann-III	-	-	-	Lit.

BERN (Bern Convention)
Appendix - II: Strictly Protected Fauna Species (SPFS)
Appendix - III: Protected Fauna Species (PFS) IUCN (International Union for Conservation of Nature and Natural Resources) Red List Categories (Version 2009.1)
IUCN
LC (Least Concern): Widespread and abundant species.
NE (Not Evaluated): Species that has not yet been evaluated against the criteria.
Central Game Commission (MAK) Decrees
Appendix-I: List of game animals protected by MAK.
Appendix-II: List of game animals whose hunting is allowed for certain periods
RDB (Red Data Book) Categories for birds, Kiziroğlu, 2012
A.1.2= The populations of these species have significantly decreased nationwide in Türkiye. In the observed regions, they are represented by 1 individual to 10 pairs (1-20 individuals).
A.2= The numbers of these species range from 11 to 25 pairs (22-50 individuals) in the observed regions. They are significantly under the threat of extinction.
A.3= The populations of these species nationwide in Türkiye generally range between (52-500) individuals in the observed regions. These are also species with a sensitivity that could be depleted, posing a high risk of extinction in the wild.
A.3.1= There is a decline in the populations of these species in the observed regions. The populations of these species range from 251 to 500 pairs (502-1000 individuals).
A.4= According to the IUCN and ATS criteria, the densities of these species, although not currently under the threat of extinction in the observed regions, show a local decline, making them potential candidates for future endangerment. The populations of these species range from 501 to 5000 pairs (1002-10,000 individuals).
A.5= There is currently no situation of decline or extinction threat in the observed populations of these species.

Legally Protected and Internationally Recognized Areas of High Biodiversity Value in Project Area of Influence

There are identified two different types of protected areas; Legally Protected Areas and Internationally Recognized Areas of high biodiversity value. Legally Protected Areas as defined by ESS6 are those that meet the IUCN definition for a protected area, while Internationally Recognized Areas are those that are exclusively defined as UNESCO World Heritage Sites, UNESCO Man and Biosphere Reserves, Key Biodiversity Areas, Important Bird Areas Alliance for Zero Extinction Sites and wetlands designated under the Ramsar Convention. When a project is located within a legally protected or internationally recognized area, WB ESS6 sets requirements in addition to those that are related to critical habitat. Accordingly, it is required to;

- Demonstrate that the proposed development in such areas is legally permitted,
- Act in a manner consistent with any government recognized management plans for areas,
- Consult and involve protected area sponsors and managers, project-affected parties including indigenous peoples and other interested parties on planning, designing, implementing, monitoring, and evaluating the proposed project, as appropriate; and
- Implement additional programs, as appropriate, to promote and enhance the conservation aims and effective management of the area.

In line with this approach, areas that have been designated a status under the Turkish protected area system, as well as areas internationally recognized areas of high biodiversity values such as Key Biodiversity Areas (KBA), Important Bird Areas (IBA) and Important Plant Areas (IPA) were screened.

Legally Protected Areas

Legally protected areas around the project area are given in Table 13 and a map showing the locations of the protected areas with respect to the Project area is presented in Figure 16. Considering the distances between the project area and the legally protected areas in the region, it is considered that there will be no project-related impacts on these areas.

Table 13. Legally Protected Areas near the Project Area

Protected Area	Air Distance to the Project Area (km)
Altındere Valley National Park	27.78 km
Çağlayandibi Nature Park	55.77 km
Artebel Nature Park	40.91 km
Tomara Nature Park	61.98 km
Limni Nature Park	26.63 km
Karşıyaka Nature Park	11.07 km
Köse Nature Park	21.11 km
Kuluca Wildlifw Development Area	43.24 km

Internationally Recognized Areas of High Biodiversity Value

Internationally Recognized Areas of high biodiversity value are defined as "areas of recognized importance to biodiversity conservation but are not always legally protected" by ESS6. These include UNESCO World Heritage Sites, UNESCO Man and Biosphere Reserves, major Key Biodiversity Areas, and wetlands within the scope of Ramsar Convention on Wetlands of International Importance. WB ESS6 also addresses that internationally recognized areas of high biodiversity value will often qualify as critical habitat; for instance, areas that meet the criteria of the IUCN's Protected Area Management

Categories Ia, Ib and II, or the majority of KBAs, which encompass, among others, Important Bird and IBAs.

In Türkiye, besides the Ministry's official work, there are various non-governmental organizations (NGOs), academic entities, as well as individual researchers and professionals who work in collaboration or independently to better understand Türkiye's natural resources and put forward impactive conservation strategies to ensure survival of habitats and species, some of which constitute unique ecosystems of global conservation value.

Doğa Derneği, published an inventory on KBAs in Türkiye in 2006 in collaboration with the Ministry of Environment and Forestry at the time, integrating survey results across the country with expert opinions[20]. The preparation of the inventory was the first time the KBA approach was applied at a national scale, which was based on principles developed by BirdLife International for bird species in their "Important Bird Areas" studies. One of the fundamental functions of the inventory is defined as "providing resource for areas and species that should be worked upon to reach zero extinction".

Eastern Black Sea Mountains Important Nature Area (INA) and Eastern Black Sea Mountains Important Plant Area (IPA) are located within the project area (see Figure 17). Due to high level of human activity in the area and its designation as an Industrial Zone, no effects are anticipated on the KBA's.

Critical Habitat Assessment

The proposed Project is located within an established industrial zone. This site has a minimal environmental sensitivity and suitability for renewable energy development. The assessment herein evaluates the potential for critical habitats and the presence of sensitive flora and fauna species at the project site. A desktop review and field survey conducted as part of this assessment confirm the absence of protected areas, Key Biodiversity Areas (KBAs), or Important Bird and Biodiversity Areas (IBAs) within or near the project site. *Streptopelia turtur* (Turtle-Dove), which is listed as "VU" according to the IUCN, will not be under threat due to project activities. The site does not meet any of the criteria for critical habitat as defined by the International Finance Corporation (IFC) Performance Standard 6 (PS6). Specifically, no globally or regionally significant biodiversity features are present, no habitat supporting migratory or congregatory species has been identified, and no unique ecosystems or areas of ecological importance exist within the project boundary.

The Critical Habitat Assessment concludes that the proposed solar power plant project site does not contain or impact any critical habitats, protected areas, or species of conservation concern. The project is not anticipated to result in significant biodiversity impacts and aligns with environmental sustainability objectives for renewable energy development.

[20] **Source:** Eken, G., Bozdogan, M., Isfendiyaroglu, S., Kılıç, D.T.& Lise, Y. 2006. Turkiye'nin Onemli Doga Alanlari. Ankara: Doğa Derneği

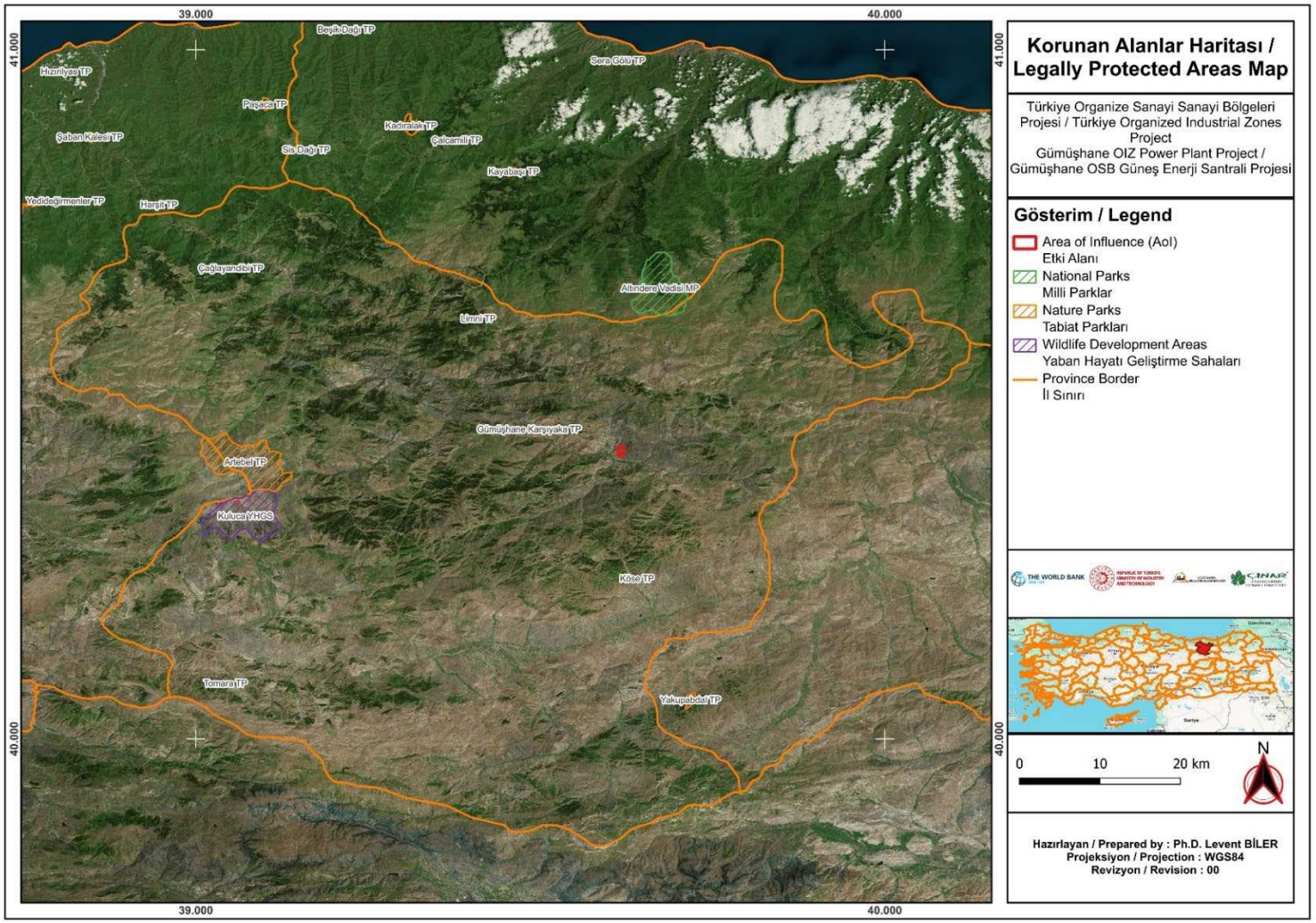

Figure 16. Legally Protected Areas near the Project Area

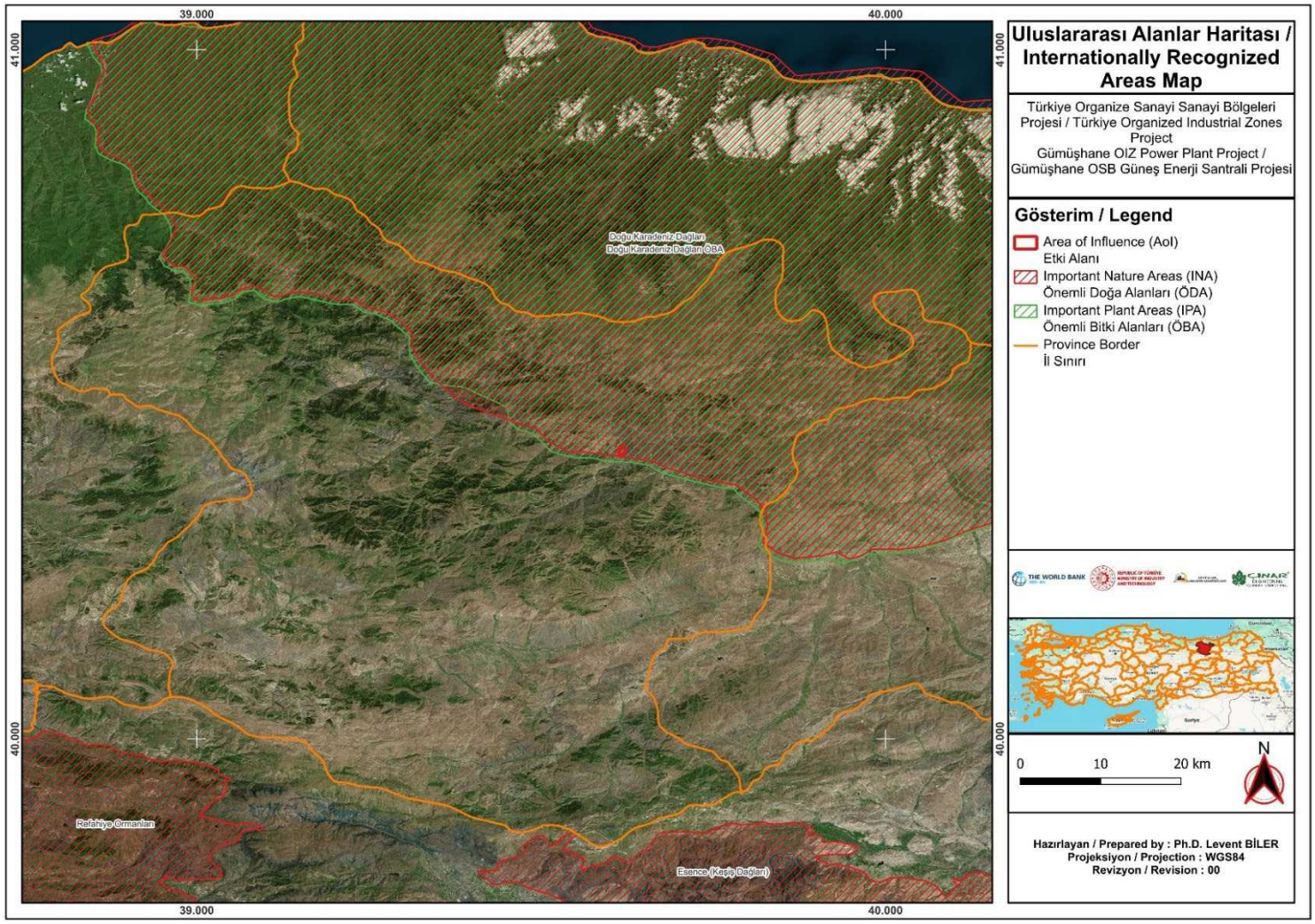

Figure 17. KBAs and the Project Area

6. SOCIAL BASELINE OF THE PROJECT

6.1 Demography and Population

Gümüşhane has six (6) districts with a population of 148,539 people. Central district has the most population (54,503 people). Central district is followed by Kelkit, Şiran and Kürtün districts, respectively. The least population is observed for Köse district (7,261 people)[21].

The population of Gümüşhane central district is 54,503 with 26,974 men and 27,529 women. The population change of central district is illustrated in Table 14.

Table 14. Population of Gümüşhane Central District over the years, TURKSAT 2023

Years	Population	Man Population	Woman Population
2023	54,503	26,974	27,529
2022	54,462	27,000	27,462
2021	54,108	26,775	27,333
2020	51,483	26,115	25,368
2019	56,398	28,138	28,260
2018	57,269	28,735	28,534
2017	57,814	28,985	28,829
2016	58,000	29,372	28,628
2015	53,074	27,123	25,951
2014	52,628	27,112	25,516

Gümüşhane OIZ is located in the Harmancık village of Gümüşhane central district. According to the information received from the mukhtar of Harmancık village, there are approximately 30 households in the village. The population change of Harmancık village is shown in the Table 15.

Table 15. Population of Harmancık village over the years, TURKSAT 2023

Years	Population	Man Population	Woman Population
2023	77	35	42
2022	47	22	25
2021	51	27	24
2020	63	33	30
2019	60	30	30
2018	88	40	48
2017	31	14	17
2016	36	17	19
2015	38	19	19
2014	49	23	26

[21]**Source:** Turkish Statistical Institute, Address Based Population Registration System, 2023, https://biruni.tuik.gov.tr/medas/?locale=en. Access Date: September 2024.

6.2 Cultural Heritage

The project area is located within the boundaries of Gümüşhane OIZ. During the site visit on 22.07.2024, there are no known adjacent cultural heritage sites or cultural resources in the project area or its vicinity. Therefore, it is considered that there are no known cultural assets or archaeological artifacts in the project area.

6.3 Livelihood and Employment

Gümüşhane is one of the provinces of the Eastern Black Sea Region in terms of mineral deposits potential. According to the sectoral distribution of industrial enterprises, the province is still developing in the field of industry in general, where the food industry with a focus on "pestil (dried layers of fruit pulp)" and "köme (churchkhela/ walnuts on a string dipped in starch grape molasses)" production, and marble and stone quarries are the leading sectors with a total share of 50%. Additionally, due to its location and weather conditions, the province is also suitable for agriculture, animal husbandry and beekeeping[22].

Settlement	Primary Economic Activity	Secondary Economic Activity
Harmancık Village	Agriculture Animal Husbandry	Paid Employment

In Harmancık village, where the OIZ is located, people generally engage in agriculture and animal husbandry activities. Agricultural activities are generally limited to vegetables. Small cattle and cattle breeding activities are conducted. According to the mukhtar, most of the population is retired.

The distribution of companies in the industrial zone where the project area is located according to sectors is given in Table 16.

Table 16. Distribution of Companies

Sector	Number of Company	Number of Employee
Feed and Fertilizer Industry	3	55
Food Sector	18	261
Forest Product Industry	2	20
Marble Industry	2	22
Metal Industry	1	10
Mining Industry	1	7
Plastic Industry	2	25

6.4 Education and Health Services

There is no educational institution and health center within the OIZ's boundary. The nearest health center is "Gümüşhane State Hospital (Gümüşhane Devlet Hastanesi) (10.1 kms to project area)". The nearest educational institutions are Turkuaz College (1.4 kms to project area) and Tekke Primary School (2.1 kms to project area).

6.5 Vulnerable/Disadvantaged Individuals/Groups and Social Equity

As per ESS10, Disadvantaged or Vulnerable Individuals or Groups (DVIG) encompass those who encounter obstacles or difficulties in fully engaging with society or are more susceptible to risks and vulnerabilities. These challenges may stem from factors like gender, economic

[22] **Source:** https://www.doka.org.tr/bolgemiz_Gumushane-TR.html

situation, social origins, age, disability, or other conditions. Addressing their needs may necessitate tailored assistance, support, or safeguarding measures to safeguard their rights, welfare, and access to equal opportunities.

The comprehensive methodology used in the identification of DVIG can be summarized as follows:

- Considering all parties involved or affected,
- Reviewing all risks in the context of E&S specifically for vulnerable groups,
- Conducting stakeholder consultations conducted before the project, including PMU and PIU,
- Identifying gaps, if any, between national and international standards,
- Including parties that could positively benefit from the project in the category of vulnerable groups.

Disadvantaged/vulnerable individuals/groups are examined in the interviews (see Annex-16).

During the interviews, the number of disabled employees, the number of female head of household and the number of foreign employees were questioned. Interviews were conducted with the OIZ Administrative Building, Duranoğulları Orman Sanayi Ticaret Limited Şirketi and Derda Yapı Sanayi Ticaret Limited Şirketi. As a result of the interviews, 2 foreign employees working at Duranoğulları were identified. However, there are no disadvantaged/vulnerable individuals/groups that will be affected by the activities to be carried out within the scope of the Project AoI. In addition, during the interview with the mukhtar of Harmancık village, it was reported that there is 1 disabled person and 1 person in need of care in the village and 2 households receive social assistance. However, there are no disadvantaged/vulnerable individuals/groups that will be affected by the activities to be carried out under Project AoI.

6.6 Land Requirement

The Project will be established on 142/1 parcel. OIZ acquired the land in the Project area through donation in 2004. The title deed for the 142/1 parcel where the ground-mounted SPP project is located is presented in Annex-2. In addition, the zoning plan is given in Annex-10.

6.7 Infrastructure Services

The information on water, wastewater, domestic waste and transportation services in Harmancık Village where the project area and Gümüşhane OIZ is located are summarized in Table 17.

Table 17. Infrastructure Services

Location	Water Resource	Irrigation Resource	Sewerage System	Waste Management	Mass Transportation Vehicle
Harmancık Village[23]	Spring Water	Spring Water	Common Septic Tank	Special Provincial Administration	Minibus
Gümüşhane OIZ (in	Two (2) Groundwater	-	WWTP	Special Provincial Administration	Minibus

[23] Information has been taken from the Mukhtar.

Location	Water Resource	Irrigation Resource	Sewerage System	Waste Management	Mass Transportation Vehicle
Harmancık Village)	(Caisson) Wells				

6.8 Traffic and Transportation

The nearest transportation route to the OIZ boundary is D885 Highway (see Figure 18). Traffic load and distance to the OIZ boundary of this highway are given in Table 18.

Figure 18. Distance of Project Area to D885 Highway

According to the 2023 Traffic Volume Maps prepared by the Ministry of Transport and Infrastructure, General Directorate of Highways (see Figure 19), traffic loads of are presented in Table 18. Machineries and equipment to be used in the construction phase of the projects are presented in Table 19.

The impact of a truck that will work during the construction activities of the project on the traffic load of the region is negligible. Other construction machineries will remain within the project area.

Table 18. Information About Transportation Routes

Highway Name	Distance to OIZ Boundary (km)	Traffic Load
D885	1.2	Automobile: 2,116 Medium Commercial Vehicle: 315 Bus: 28 Truck: 140 Truck+Trailer, Tow Truck+Semi Trailer: 150 Total: 2,749

Table 19. Vehicles to be Used During the Construction Phase

Vehicles	Number of Vehicles
Crane	1
Piling Machine	1
Grader	1
Digger	1
Truck	1
Concrete Pump	1
Mixer	1

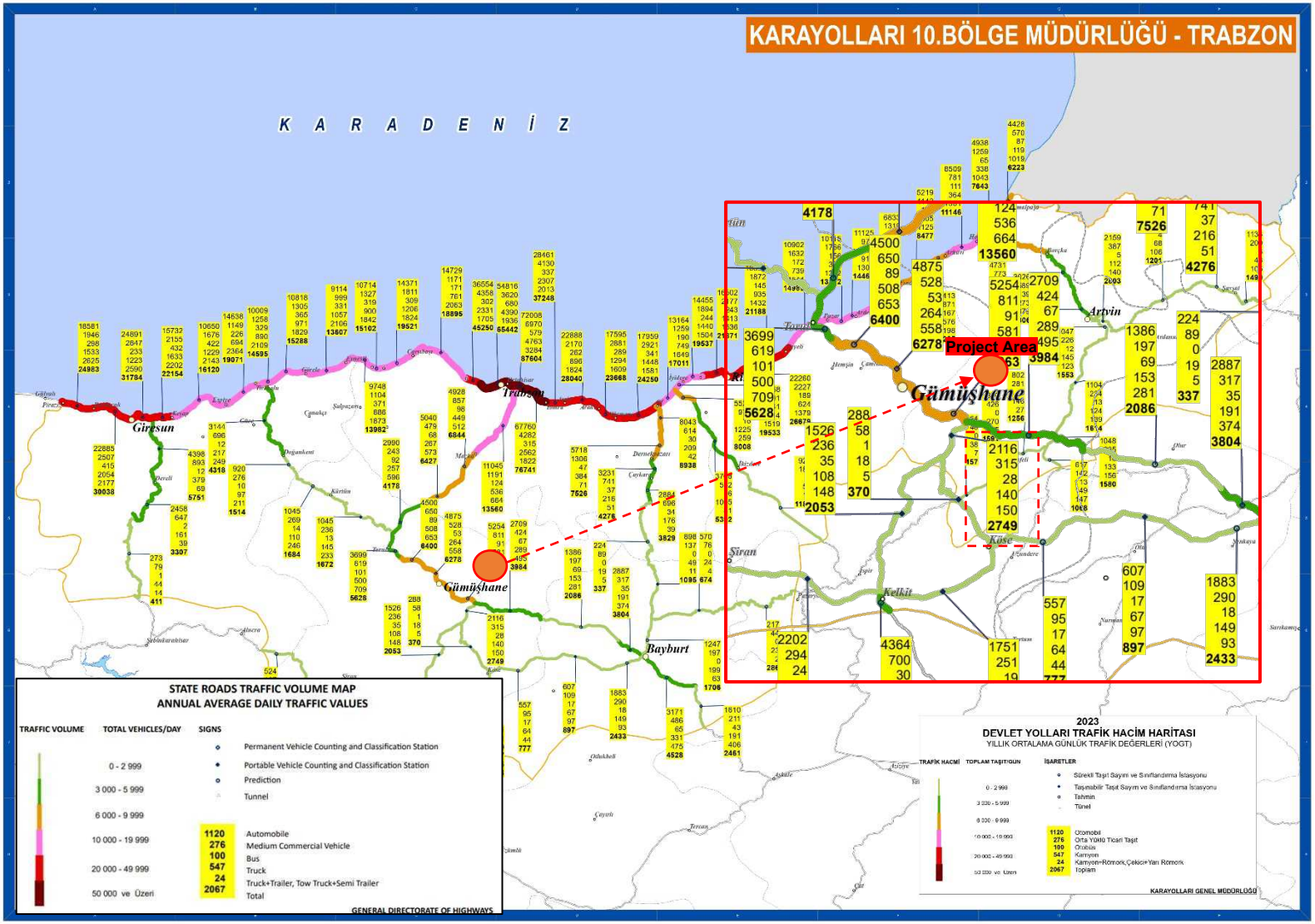

Figure 19. Highways Traffic Volume Map (2023)

7. ENVIRONMENTAL AND SOCIAL RISKS AND IMPACTS OF THE PROJECT

7.1 Environmental Risks and Impacts of the Project

In the EIA Regulation published in the Official Gazette dated 29.07.2022 and numbered 31907, the area of influence (AoI) is defined as "the area affected by a project planned to be realized before, during and after operation".

The environmental and social assessment is defined in WB ESS1 (Assessment and Management of Environmental and Social Risks and Impacts) Paragraph 23 as:

"The Borrower will carry out an environmental and social assessment of the project to assess the environmental and social risks and impacts of the project throughout the project life cycle. The assessment will be proportionate to the potential risks and impacts of the project, and will assess, in an integrated way, all relevant direct, indirect and cumulative environmental and social risks and impacts throughout the project life cycle, including those specifically identified in ESS2-10."

The impact area of the project is determined as a circle with a radius of 600 meters from the project area (see Figure 20).

600-meter AoI has been determined considering environmental and social impacts of the project. There are only facilities and businesses in AoI of project area. There are no sensitive receptors such as schools, mosques, health centers, etc. in AoI of the project area (see Figure 20).

There are no educational institutions within the boundaries of Gümüşhane OIZ. The nearest educational institution to the project area is "Turkuaz College" approximately 1.4 kilometers away by air distance. There is no mosque within the OIZ. The closest mosque to the project area is Yeniyol Village Mosque which is 1.9 kilometers to the project area.

In this section, the potential impacts of the project's pre-construction, construction and operation activities on air quality, water resources, noise level, waste management, wastewater management, soil quality and biodiversity were investigated.

In addition, estimated amount of air emissions, noise level increase, water use and wastewater to be generated because of the construction and operation activities have also been provided. The calculated values were compared with the project standards.

Assessments regarding the environmental and social risks and impacts that are foreseen to occur within the scope of the project's pre-construction, construction and operation activities are presented under the following headings.

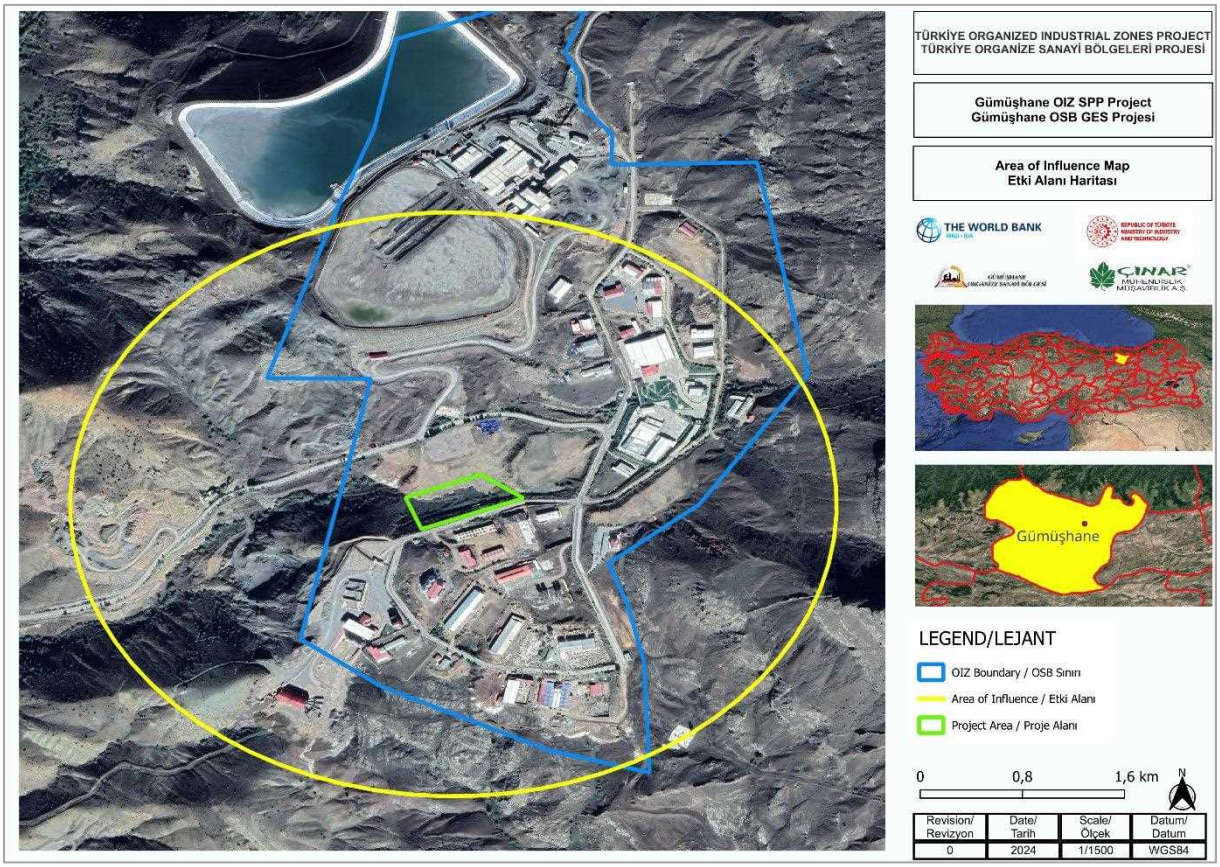

Figure 20. AoI for the Project Area

7.1.1 Land Use

7.1.1.1 Construction Phase

Since the project area is owned by Gümüşhane OIZ, no land acquisition is planned.

During the construction phase, all work will be confined to the area (142/1 parcel) designated for the project, ensuring that there will be no significant impact on land use outside of these specified zone.

7.1.1.2 Operation Phase

During the operation phase of the project, the use of land will be strictly limited to the project area. Maintenance and repair activities will only be conducted in the event of a failure of the carport structure and solar panels. As a result, there will be no new land usage introduced during this phase. Consequently, no impact on land use is anticipated throughout the operation phase.

7.1.2 Hydrogeology

7.1.2.1 Construction Phase

The project area is not within the protection area of any surface water source that provides drinking and utility water. The stream beds in question have been rehabilitated against flood risk and have sufficiently wide sections and do not pose a flood risk in the project area. There are no groundwater resources within the project's area of influence. Therefore, no significant adverse impact is expected on the existing groundwater resource status of the area due to the project activities.

With the implementation of appropriate measures, it is expected that there will be no significant impact on the region's hydrogeological structure (presence of surface water and groundwater) during the construction phase.

Since the proposed sub-project area does not coincide with surface water or groundwater resources as the closest surface water is a tributary Doğankent Stream, 0.92 km northwest and the closest groundwater wells used by OIZ is 1.23 km south, any risks/impacts on surface water and/or groundwater are not foreseen due to the sub-project activities during both installation and operation phases.

7.1.2.2 Operation Phase

The project will have no impact on the hydrogeology of the region during the operation phase.

7.1.3 Climate and Vegetation

7.1.3.1 Construction Phase

The 142/1 parcel has grass, bushes, *Pinus nigra* (Austrian pine / Black pine) and *Robinia* pseudoacacia (Black locust) (approximately 50 trees) at around 5,000 m2, and the soil has not been altered. The soil and vegetation on this area will be disturbed due to construction activities.

Therefore, the project activities are not expected to have a significant adverse impact on climate and vegetation.

7.1.3.2 Operation Phase

There will be no work in the project area except the maintenance/repair works. Therefore, no impact on vegetation is expected during the operation phase of the project.

7.1.4 Soil Quality

7.1.4.1 Construction Phase

Excavation works will be carried out in the project area and then the area will be covered with concrete. Therefore, it is foreseen that there will be a significant impact on the existing soil structure during the construction phase.

Within the scope of the project, 0.20 m of vegetative soil (topsoil) will be stripped from the soil surface. Topsoil on a 5,000 m^2 area will be stripped due to the installation of the ground-mounted SPP. Stripped topsoil will be utilized in green areas within the OIZ and will not be stored in the project area.

Technical operations such as maintenance, refueling and oil changes of the machinery and vehicles that will work during the construction phase of the project will be conducted at authorized services and that will reduce the risk of soil contamination at the project area.

7.1.4.2 Operation Phase

Since the ground of the project area will be concrete, there will be no contact with the soil. Therefore, no impact on soil quality is expected during the operation phase.

7.1.5 Air Quality

7.1.5.1 Construction Phase

Within the scope of the project, 0.20 m of vegetative soil (topsoil) will be stripped from the soil surface. Topsoil on a 5,000 m^2 area will be stripped due to the installation of the ground-mounted SPP.

Moreover, excavation will be carried out for transformer cabling, transformer and inverter buildings and electric transmission line. Excavation dimensions for the project are summarized in Table 20.

Table 20. Excavation Dimensions for the Ground-mounted SPP Project

Parameter	Dimensions
Transformer Building	2.5 m (width)*7.5 m (length)*1.20 (depth)
Transformer Cabling	0.8 m (width)* 25 m (length)* 1.20 (depth)
Inverter Building	10 m (width)* 10 m (length)* 1.20 (depth)
Electric Transmission Line[24]	2 m (width)* 450 m (length)* 1.00 (depth)
Topsoil Depth (for stripping)	20 cm (0.20 m)
Excavation Depth	80 cm (0.80 m)
Total Topsoil Stripping Area	5,000 m²

The construction period will last for three months (90 days) and considering that the excavation works will take 45 days. Dust emission will occur during the excavation for transformer building and cabling and stripping of topsoil and loading it to the truck. Dust emission calculations details are given in Annex-4.

Since the excavation material and topsoil will be transported on asphalt roads, dust emissions from transportation are not included in the calculation. The excess excavation material is not planned to be stored at the project area. It will be sent to the licensed excavation material storage area belonging to the Gümüşhane Municipality with the licensed vehicles. Stripped topsoil will be utilized in green areas within the OIZ and will not be stored in the project area.

It is calculated that 23.733 tons/45 days = **527.4 tons/day** of excavation material, and only work for ten (10) hours during daylight hours, the amount of excavation soil waste that will result from the excavation works to be carried out before the construction activities is calculated as **52.74 tons /hour**.

Since the mass flow rates (1.83 kg/hour with uncontrolled and 0.91 kg/hour with controlled) of dust emission resulting from the stripping and loading works is below 1 kg/hour, which is the limit value given for non-chimney sources in Annex-2 Table 2.1 of the Regulation on Control of Industrial Air Pollution. Hence, no modelling work was required. Hence, there is no need to calculate air quality contribution values and make a model. All excavation works will be carried out in a controlled condition.

It is expected that dust emission will be at a controlled level with the measures given in Section 8 and will not have a significant adverse impact on ambient air quality. Dust emissions within the scope of the project will be short-term.

Dust and Exhaust Gas Emission from Vehicles

Dust and gas emissions will occur from the vehicles to be used within the scope of the construction phase of the project. Within the scope of the project, it is assumed that the quantity of diesel fuel consumed by the construction vehicles will be 20 liters per hour on average. Necessary calculations are given in Annex-4.

[24] This is a transmission line from a transformer to the nearest electric pole. The electric will be distributed from the electric pole to the general system. The electric pole and line between electric pole and transformer is inside the OIZ. The electric pole is near the SPP area.

Calculations are made with the assumption that vehicles/work machines will work at the same time. However, vehicles and construction machines will be used at different times.

Therefore, the pollutant emissions calculated will be much less. The concentration values of the pollutants that will originate from the construction vehicles to be used are quite low. Hence, it is not expected that the emission values from the vehicles will have an adverse effect on the existing ambient air quality of the region.

The calculation results are given in Table 21. Exhaust gas emissions from vehicles meet project standards. Since this calculation is based on the vehicles operating at full capacity, the calculated emission is expected to be lower in practice. Nevertheless, dust and exhaust gas emissions from construction machinery can be reduced by measures such as keeping vehicle use to a minimum, ensuring validity of the periodical exhaust emission inspections of the vehicles and training personnel.

Table 21. Air Quality Project Standards and Calculated Emission Values

Parameter	Unit	Calculated Emission Values	Project Standard
PM10	kg/hour	Exhaust Gas (Construction machinery): 0.2485	1
		Excavation Works Uncontrolled: 1.83 kg/hour Controlled: 0.91 kg/hour	
PM2.5*	kg/hour	Exhaust Gas (Construction machinery): 0.173	
		Excavation Works Uncontrolled: 1.28 kg/hour Controlled: 0.63 kg/hour	
Carbon monoxide	kg/hour	1.2747	50
Volatile Organic Compounds	kg/hour	0.39949	3
Nitrous oxides	kg/hour	3.86001	4
Sulphur Oxides	kg/hour	0.001183	6

**The EPA recognizes that fine particulate matter (PM2.5) generally constitutes a large proportion of PM10, often around 60-70% in urban environments where combustion processes dominate*[25] .

7.1.5.2 Operation Phase

No excavation activities will be carried out during the operation phase of the project. There will be no use of vehicles / construction equipment for the operation phase. If there is a need for solar panels during the operation phase, the solar panel supplier company will transport the panels to the related project area using their own vehicles. Therefore, no air emissions are expected to occur during the operation phase of the project.

7.1.6 Noise

7.1.6.1 Construction Phase

It is foreseen that noise will be generated during the construction phase of the project due to the use of work machines and equipment. The placement of solar panels on project area will be carried out with the help of a crane. The installation of the solar panels will be done manually in sections. During the fixing of the panels, minor noise may occur due to the use of hand tools. In addition, noise will also be generated during the excavation.

The number and sound power levels of the vehicles and work machines to be used are given in the Table 22.

[25] U.S. EPA Air Quality Criteria for Particulate Matter (2004)

Table 22. Number and Sound Power Levels of Machinery Equipment to be used for Construction Phase

Machinery Equipment Name	Number	Sound Power Level (dB)
Crane	1	110
Piling Machine	1	50
Grader	1	136
Digger	1	105
Truck	1	94
Concrete Pump	1	109
Mixer	1	108

Noise level calculations results according to the distances are given in Annex-4 and noise level changes according to distances are given in Figure 21.

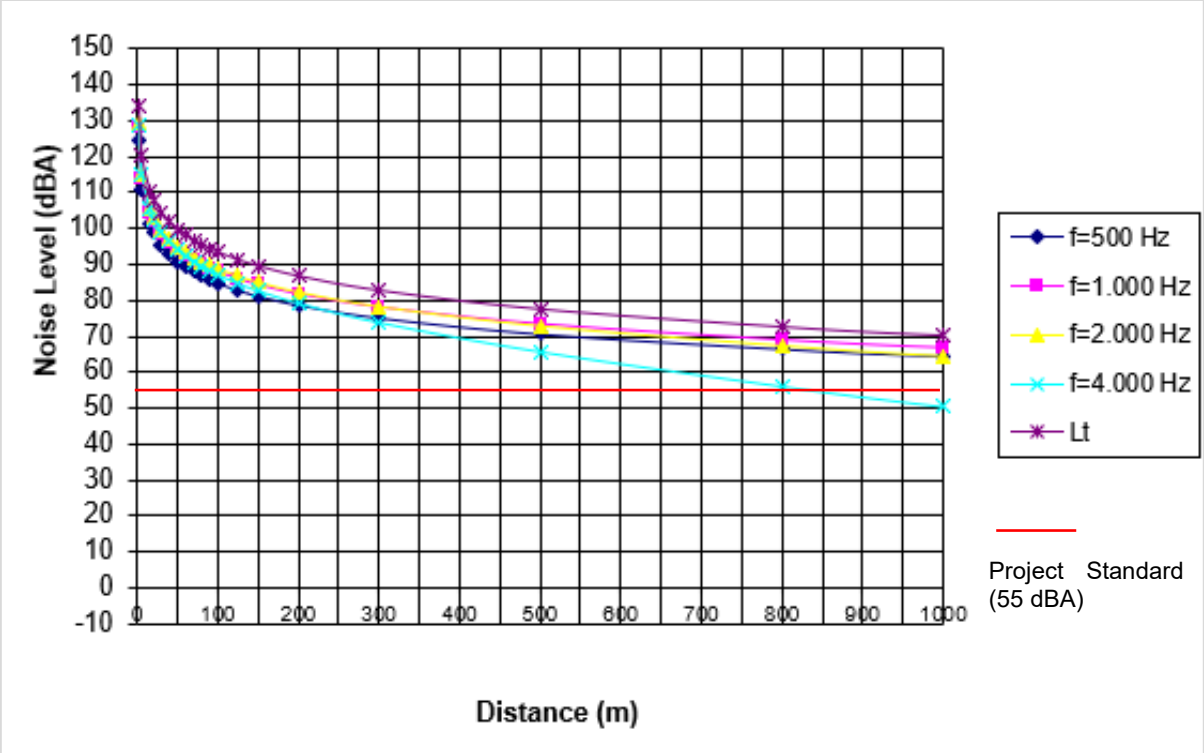

Figure 21. Change in Noise Levels According to Distances for Ground-mounted SPP

The calculations given in Table 24 are based on AoI and nearest settlements. Accordingly, the 55 dB(A) limit value is not met in the AoI and nearest settlements.

Excavation activities will be carried out for purposes such as topsoil stripping, transformer and inverter buildings, and transformer cabling. Concrete covering of the ground will be done later. The concrete pump and mixer will operate for only one (1) day. Since these activities will be conducted step by step, not all machinery will operate simultaneously. The calculations have been made based on a scenario where all machinery operates at the same time. In practice, it is very difficult to have all work machines working at the same time. Therefore, the noise level generated will be lower than the calculated amounts.

Table 23. Noise Level Project Standards and Calculated Noise Levels for Ground-mounted SPP Project

Location	Distance to the Project Area (km)	Calculated LT (dBA)	Project Standards (dBA)
Bahçecik village	2.1	62.11	55
Yeniyol village	2.2	61.58	
Harmancık village	2.3	62.07	
Pirahmet village	2.7	59.23	
Tekke village	3.14	57.47	
Arzularkabaköy district	3.2	57.25	

The mitigation measures given in Section 8 will be followed. These effects can be managed with standard precautions regarding construction activities (proper arrangement of working hours regarding noisy activities, providing necessary information to the surrounding residences, use of necessary personal protective equipment by personnel etc.). During the construction phase, potential public complaints will be managed through the available Grievance Mechanism (see Section 11.3.).

The noise impact will be short-term within the scope of the project. In case of complaints from businesses in AoI or settlements the work will be stopped and noise level measurements will be realized by an accredited laboratory.

7.1.6.2 Operation Phase

There are no activities that may cause noise during the operation phase of the project, since the solar panels to be installed work silently. Therefore, no noise impact is expected during the operation phase of the project.

SPP Projects are exempt from noise within the scope of environmental permit.

7.1.7 Water Resources and Use

7.1.7.1 Construction Phase

During the construction phase, the available water by the OIZ system (groundwater wells) will be used for human consumption, cleaning activities during installation and concrete irrigation.

The water requirement during the construction phase will be supplied from the OIZ water network. Within the OIZ, potable water is supplied from two (2) groundwater (caisson) wells.

The State Hydraulic Works indicating its no-objection for the use of two (2) wells by the OIZ 12.01.2024 dated and 4239802 numbered is presented in Annex-1.5. Therefore, groundwater will be used indirectly within the scope of the project.

The personnel, who will work during the construction phase of the project, will use mobile toilets or toilets with the leakproof septic tank. The drinking water needs of the personnel will be purchased from the market as carboy size bottled water.

The water demand for ten (10) personnel to be employed for the construction phase is calculated as follows by assuming that the daily water withdrawal per capita in Gümüşhane province for the year 2022 is 206 l/person-day[26]:

10 employees x 0.206 m³/person-day = 2.06 m³/day

[26] **Source:** www.tuik.gov.tr, Daily Water Use Per Capita in Gümüşhane Province, 2022

There will be no accommodation within the scope of the project, as the working time is 10 hours:

2.06 m³/day * (10 hours/24 hours) = 0.85 m³/day (for 10 hours)

The water demand for cleaning activities during installation of solar panels will be approximately 15 m³ (0.33 m³/day)[27].

During the construction phase, project area will be wetted at regular intervals to minimize dust emissions that may be resulted from the activities, such as vehicle movements etc., on the site. The water is planned to be supplied via water trucks. It is foreseen that 2 m³/day water will be used for wet dust suppression activities. As the water to be used for dust suppression will evaporate, no wastewater generation is foreseen.

Also, approximately 2 m³/day water will be used for concrete irrigation during construction phase. Concrete irrigation is expected to take 15 days. No water will be used in the preparation of concrete. Concrete will arrive at the site ready. Water will only be used for the irrigation of concrete (to prevent cracking). As the water to be irrigated will evaporate, no wastewater generation is foreseen.

The project is not expected to have a significant adverse impact on water resources as the water requirement during the construction phase of the project will be supplied from the groundwater (caisson) wells already used by OIZ.

7.1.7.2 Operation Phase

No additional personnel will be employed during the operation phase of the project, water use by personnel is not expected.

With the commissioning of the planned project, water will be required for cleaning of the PV modules to increase the efficiency, and the cleaning will be performed approximately every six (6) months. Clean water will be used for panel cleaning. There will be no use of chemicals/detergents together with cleaning water. Illustrative views from panel cleaning process are given in Figure 22.

In the operation phase, the water consumption for cleaning activities during maintenance and repair is expected to be 15 m³ (0.04 m³/day)[28].

The water to be used for washing the panels during the operation phase will be supplied from the OIZ network and brought in bottles. Cleaning will be carried out with a brush or fabric (see Figure 22

Groundwater will be used as the water demand within the scope of the project will be supplied from the OIZ network. The potable water of OIZ is supplied from caisson wells. Since there are no natural water resources in and around the project area, no measurements have been made. No significant impact on water resources is expected during the operation phase of the project.

[27] This information has been provided from E&S Screening Form. 15 m^3 / 45 days (for installation) = 0.33 m^3/day.
[28] This information has been provided from E&S Screening Form. 15 m^3 / 365 days (1 year) = 0.04 m^3/day.

Figure 22. Illustrative Views of Panel Cleaning[29]

7.1.8 Wastewater Management

7.1.8.1 Construction Phase

Assuming that all the water (100%) used by personnels will be converted into wastewater, 0.85 m³/day wastewater will occur in the construction phase. No wastewater will be generated during panel cleaning, land irrigation (dust compression) and concrete irrigation (to prevent cracking) activities. The mobile toilets with their own reservoirs will be used during the construction phase, or a leak-proof septic tank will be constructed by the OIZ. In both options, the collected wastewater will be extracted with vacuum trucks and transferred to the OIZ's WWTP. If required, the nearest licensed wastewater treatment plant, the Gümüşhane Municipality WWTP, can be utilized under a protocol/agreement with the Municipality. This will be considered till the environmental permit for the WWTP of OIZ is secured.

7.1.8.2 Operation Phase

Since no additional personnel will be employed during the operation phase of the project, no additional wastewater is generated.

Cleaning of the panels will be carried out by spraying method with the help of a brush or fabric and no wastewater will be generated.

The water requirement during the construction and operation phases of the project, the quantity of wastewater generated, and the disposal methods are summarized in Table 24.

[29] **Sources:** https://www.forbes.com/home-improvement/solar/how-to-clean-solar-panels/ & https://www.bobvila.com/articles/how-to-clean-solar-panels/

Table 24. Water Usage Areas, Quantities and Wastewater Disposal Type

Period	Purpose of Use	Supply	Requirement (m^3/day)	Wastewater (m^3/day)	Disposal
Construction	Personnel domestic and drinking water	OIZ's Groundwater Wells	0.85	0.85	Leak proof septic tank
	Panel cleaning during installation	By Bottles/Drums from Gümüşhane OIZ's water network (from OIZ's Groundwater Wells)	0.33	Evaporation	-
	Concrete irrigation	Transported water	2	Evaporation	-
TOTAL			3.18		
Operation	Panel Cleaning	By Bottles/Drums from Gümüşhane OIZ's water network (from OIZ's Groundwater Wells)	0.04	Evaporation	-
TOTAL			0.04		

7.1.9 Waste Management

7.1.9.1 Construction Phase

Within the scope of the project, during the construction of the SPPs, waste generation from materials, installation and personnel is expected. Waste generation during the construction phase will be low. Possible wastes are given in Table 25.

It is envisaged that ten (10) personnel will be employed during the construction phase. According to Turkish Statistical Institute data, average daily municipal waste quantity is 0.65 kg/day per capita for Gümüşhane province in 2022.

Accordingly, daily domestic waste amount calculated for ten (10) personnel in construction phase of the project is calculated as 6.5 kg/day.

During the construction phase, the packaging wastes to be generated are paper-cardboard, plastic, glass, etc. Assuming that the quantity of packaging waste generated will be approximately 20% of the total quantity of domestic solid waste, the amount of packaging waste for the construction phase is 1.3 kg/day.

Domestic wastes to be generated by personnel during the construction phase will be placed in containers belonging to Gümüşhane OIZ.

The contractor will be responsible for the accumulation of other wastes to be generated during the construction phase and sending it to licensed companies. A clause will be added to the contract between the Contractor and Gümüşhane OIZ stating that the management of the wastes generated by the project is the responsibility of the Contractor.

The Contractor will establish a temporary hazardous and non-hazardous waste storage area during the construction phase.

The food needs of the personnel will be provided by purchasing from outside. In this context, no vegetable waste oil is expected to be generated within the site.

No medical waste generation is expected in the project area. As the nearest hospital (Gümüşhane State Hospital (Gümüşhane Devlet Hastanesi)) will be applied in case of health problems of the personnel to be employed.

In case of damaged solar panels during the construction phase of the project, such damaged/broken solar panels will be removed from the project area by Contractor. Since solar panels are not placed on the soil structure, there will be no soil contamination in case of breakage. Since solar panels may include hazardous materials such as cadmium, zinc, lead, Chlorofluorocarbons (CFCs), in the event of a release of these dangerous substances causing negative environmental effects, the concrete floor can be cleaned with an absorbent cloth/fabric, and this hazardous waste will be delivered to a disposal company. The recycling/disposal of the damaged solar panels from the project area is the responsibility of the solar panel manufacturer. According to the statement of Gümüşhane OIZ authorities, if the damage to the solar panels is under guarantee, it is refunded, and if there is an external malfunction, the solar panel is replaced. To prevent any risk of accident/explosion/fire, the damaged solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The damaged/broken solar panels will be removed from the project area on the same day.

Wastes to be potentially generated during the construction phase of the project are given in Table 25.

Table 25. Construction Phase Waste Table

Waste Code	Explanation	Source	Disposal	Characteristic
20 03 01	Mixed municipal waste	Personnel activities	Special Provincial Administration	Non-hazardous
15 01 01	Paper-cardboard	Product and material packages	Licensed recycling company	Non-hazardous
15 01 02	Plastic Packaging			
15 01 03	Wooden packaging			
15 01 07	Glass Packaging			
15 01 04	Metal Packaging			
16 01 03	End-of-Life Tires	Vehicles/Work Machineries	Licensed recycling/disposal company	Non-hazardous
16 02 14	Discarded equipment other than that mentioned in 16 02 09 to 16 02 13	End-of-life solar panels	Solar panel manufacturer	Non-hazardous
16 06 05	Other batteries and accumulators	Vehicles/Work Machineries	Licensed recycling/disposal company	Non-hazardous
16 01 07*	Oil filters	Vehicles/Work Machineries	Licensed recycling/disposal company	Hazardous
20 01 35*	Recycled electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35	Installation		
20 01 36	Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23	Installation	Licensed recycling/disposal company	Non-hazardous
13 02 08*	Other engine, transmission and lubricating oils	Vehicles/Work Machineries	Licensed recycling/disposal company	Hazardous
15 01 10*	Packaging materials containing residues of hazardous substances or contaminated with hazardous substances	Maintenance, repair or installation	Licensed recycling/disposal company	Hazardous
15 01 11*	Metallic packaging materials containing hazardous porous solid structure (e.g. asbestos), including			

Waste Code	Explanation	Source	Disposal	Characteristic
	empty pressure vessels			
15 02 02*	Absorbents contaminated with hazardous substances, filter materials (oil filters if not otherwise specified), cleaning clothes, protective clothing	Maintenance, repair, or installation	Licensed recycling/disposal company	Hazardous
15 02 03	Absorbents, filter media, cleaning cloths, protective clothing other than 15 02 02	Maintenance, repair, or installation	Licensed recycling/disposal company	Non-hazardous
20 01 26*	Oils and fats other than 20 01 25	Refectory	Licensed recycling/disposal company	Hazardous
17 04 11	Cables other than 17 04 10	Cabling	Licensed recycling/disposal company	Non-hazardous
17 05 04	Excavation Materials	Excavation Works	Gümüşhane Municipality Excavation Materials Storage Area	Non-hazardous
17 04 07	Mixed Metals	Installation	Licensed recycling/disposal company	Non-hazardous

7.1.9.2 Operation Phase

Waste generation from maintenance and repair activities is expected during the operation phase of the SPP. The maintenance/repair contractor will be responsible for the management of wastes arising from the maintenance and repair of the project units.

No additional personnel will be employed during the operation phase of the project

The type and amount of waste will be low due to maintenance and repair activities. The amount of waste will vary depending on maintenance and repair activities. Since no additional personnel will work during the operation phase, no additional domestic waste generation is expected.

In case of the generation of damaged solar panels during the operation phase of the project, damaged/broken solar panels will be removed from the project area by contractor. Since solar panels are not placed on the soil structure, there will be no soil contamination in case of breakage. Since solar panels may include hazardous materials such as cadmium, zinc, lead, CFCs, in the event of the release of these dangerous substances causing negative environmental effects, the concrete floor can be cleaned with an absorbent cloth/fabric, and this hazardous waste will be delivered to a disposal company. The recycling/disposal of the damaged solar panels from the project area is the responsibility of the solar panel manufacturer. According to the statement of Gümüşhane OIZ authorities, if the damage to the solar panels is under guarantee, it is refunded, and if there is an external malfunction, the solar panel is replaced. To prevent any risk of accident/explosion/fire, the damaged solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The damaged solar panels will be removed from the project area on the same day.

Therefore, the significance of the impact will be low.

Wastes to be potentially generated during the operation phase of the project are given in Table 26.

Table 26. Operation Phase Waste Table

Waste Code	Explanation	Source	Disposal	Characteristic
20 01 36	Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23	Maintenance and repair	Licensed recycling/disposal company	Non-hazardous
15 01 10*	Packaging materials containing residues of hazardous substances or contaminated with hazardous substances	Maintenance and repair	Licensed recycling/disposal company	Hazardous
15 01 11*	Metallic packaging materials containing hazardous porous solid structure (e.g. asbestos), including empty pressure vessels			
15 02 02*	Absorbents contaminated with hazardous substances, filter materials (oil filters if not otherwise specified), cleaning clothes, protective clothing	Maintenance and repair	Licensed recycling/disposal company	Hazardous
15 02 03	Absorbents, filter media, cleaning cloths, protective clothing other than 15 02 02	Maintenance and repair	Licensed recycling/disposal company	Non-hazardous
17 04 11	Cables other than 17 04 10	Cabling	Licensed recycling/disposal company	Non-hazardous
16 02 14	Discarded equipment other than that mentioned in 16 02 09 to 16 02 13	End-of-life solar panels	Solar panel manufacturer	Non-hazardous
20 01 35*	Discarded electrical and electronic equipment containing dangerous parts other than those mentioned in 20 01 21 and 20 01 23	End-of-life solar panels	Licensed recycling/disposal company	Hazardous

7.1.10 Natural Disaster Potential

7.1.10.1 Construction Phase

All kinds of structures to be built within the scope of the project must comply with the principles of the "Regulation on Buildings to be Built in Disaster Areas" published in the Official Gazette dated 14.07.2007 and numbered 26582 of the Repealed Ministry of Public Works and Settlement and published in the Official Gazette numbered 30364 dated 18.03.2018 and published on 01.01.2019. The provisions of the "Turkish Building Earthquake Regulation" of the Disaster and Emergency Management Presidency, which came into force in 2019, will be strictly adhered to.

So, the project will not have any impact on the natural disaster potential of the region and the natural disaster potential of the region will not have any impact on the project.

7.1.10.2 Operation Phase

If national legislation (Regulation on Buildings to be Built in Disaster Areas) is complied with during the operation phase, no negative impact is expected from the project in this regard during the operation phase.

7.1.11 Biodiversity and Protected Areas

Due to the project area is situated within the Organized Industrial Zone and under high human activity, no expected impact on protected areas, habitats, or species has been identified. Only the plantations of *Pinus nigra* (Austrian pine / Black pine) and *Robinia* pseudoacacia (Black locust) (approximately 50 trees) should be relocated before Project activities.

The plantations of *Pinus nigra* (Austrian pine / Black pine) and *Robinia* pseudoacacia (Black locust) should be relocated before project activities.

7.1.12 Pesticide Use and Management

7.1.12.1 Construction Phase

No pesticides will be used during the construction phase of the Project. Therefore, no adverse impact is expected due to the use of pesticides.

7.1.12.2 Operation Phase

No pesticides will be used during the operation phase of the project. Therefore, no adverse impact is expected due to the use of pesticides.

If landscaping is carried out in project area during operation and pesticides are used during this work, the following issues should be complied with the scope of WB ESS3.

- Where possible, the use of persistent organic pollutants (POPs) in pesticide formulation should be avoided or minimized.
- Safety rules for storage, handling and distribution of pesticides should be followed to minimize the potential for misuse, spillage and accidental human exposure.
- The use of pesticides containing chemicals listed in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade should be avoided.

7.2 Social Impacts of the Project

7.2.1 Population/Demography

7.2.1.1 Construction Phase

The timeline of the project is given in Table 3. The 8-month period covered the pre-construction and construction phases of the project (obtaining permits and construction of SPP). The construction period will last for three months (90 days) and considering that the excavation works will take 45 days. Ten (10) personnel will be employed during the construction phase.

No accommodation will be provided for project workers. Transportation to the project area will be arranged by the Contractor. The number of workers ensures no impact on the population and demography of nearby settlements. Therefore, there is no expected impact caused by labor influx.

7.2.1.2 Operation Phase

There will be no employment during the operation phase of the project. Therefore, there is no expected impact on the population/demography.

7.2.2 Cultural Heritage

The project area is located within the boundaries of OIZ. Therefore, it is considered that there are no cultural assets or archaeological artifacts in the project area. Excavation activities will be carried out for purposes such as topsoil stripping, transformer and inverter buildings, and line from transformer to the nearest electric pole. Since excavation works will be carried out within the scope of the Project, there is a possibility of encountering cultural assets or archaeological artifacts during the construction phase.

Site visits confirm no known cultural assets or archaeological artifacts in or around the project area. In this context, a "Chance Find Procedure" has been prepared for the construction and operation phases of the project (see Annex-7). If any archaeological remains or objects are found, the construction activities will be stopped, and the Museum Directorate will be informed immediately pursuant to Article 4 of Law No. 2863.

7.2.3 Economy/Employment

7.2.3.1 Construction Phase

The project timeline, as outlined in Table 3, indicates a three-month (90 days) construction phase. Ten (10) personnel will be employed during the construction phase. The Project Owner is responsible for providing minimum legal labor standards according to LMP of the TOIZP and as per International Labor Organization (ILO) regulations. Full compliance with all Turkish Laws and International Labor Organization Conventions regarding child labor, forced labor, discrimination, freedom of association, collective bargaining, working hours and minimum wages. Work permits will be monitored, and recruitment will adhere to legal practices, avoiding unregistered, child, or forced labor.

To mitigate adverse impacts on employees, contractors must develop own Labour Management Plan based on the LMP of the TOIZP, and provide written contracts to employees, code of conduct training, ensuring workers understand and sign it during recruitment. The Project Owner oversees this process. The construction phase aims to offer temporary employment, prioritizing local materials and services to positively impact the local economy. Given the limited workforce and construction duration, the Project's impact on the local economy and employment is expected to be positive, local, and minor. Besides, there is no expected labor influx.

7.2.3.2 Operation Phase

There will be no employment during the operation phase. Therefore, there is no expected impact on local economy in line with local employment opportunities.

7.2.4 Vulnerable/Disadvantaged Groups

7.2.4.1 Construction Phase

According to meetings, disabled people, foreign employees, female heads of households, etc. have been assessed, there are no disadvantaged people or groups that will be affected by the Project activities.

7.2.4.2 Operation Phase

No impacts for vulnerable/disadvantaged groups are expected during the operation phase of the Project.

7.2.5 Land Acquisition

Plot 142/1 has been acquired by OIZ since 2004. Therefore, there is no land acquisition within the scope of the project.

7.2.6 Working Conditions and Labour Management

7.2.6.1 Construction Phase

Working conditions during construction phase will be managed by Project owner and contractor in line with the following items.

The project owner's responsibilities are outlined as follows:

- Ensure voluntary employment relationships to preserve the dignity of the workforce.
- Practice equal opportunities and fair treatment in the workplace, eliminating discrimination and harassment based on factors such as language, race, sex, political opinion, philosophical belief, and religion in labor relations.
- Recognize the right to freedom of association without fear of reprisal and uphold the right of workers to engage in collective bargaining.
- Foster a harmonious employer-employee relationship through dialogue and negotiation to establish fair employment conditions.
- Ensure adherence to LMP, LM Plan, and ILO conventions to scrutinize working hours to prevent exploitation and establish minimum wage levels to ensure a decent standard of living
- Ensure full compliance with ethical labor practices for a socially responsible work environment.
- Implement the right to collective bargaining in accordance with Law No. 6356 on Trade Unions and 4857 Labour Law on Collective Bargaining.
- Establish, maintain and ensure effective operation of the grievance mechanism throughout the life of the Project.
- Guarantee an efficient Project grievance mechanism to address concerns. Ensure contractor provides workers with detailed written contracts encompassing job descriptions, working hours, wages, rights and responsibilities, a code of conduct, and information about the workers' grievance mechanism.
- Minimize potential impacts on surrounding neighborhoods by offering amenities within the Project Area aligned with the employees' needs.

- Support this application with a Human Resources Policy compliant with the European Convention on Human Rights and the Turkish Constitution.

The responsibilities of Contractor also mentioned as follows:

- Contractor will develop its own LM Plan. This plan will encompass various provisions, including the assurance that workers will be provided with written contracts detailing job descriptions, working hours, wages, rights and duties descriptions, and a Code of Conduct, among other aspects.
- Informing MoIT PIU of any issues related to their engagement with stakeholders
- To keep local communities informed about any environmental monitoring activities such as noise, vibration, water quality monitoring, etc.
- To ensure transparency and awareness regarding the environmental impact of the project.
- To develop and implement a GM specifically for the workforce, before commencement of any works on site, including subcontractors.
- To address and resolve any concerns or grievances that may arise among the workforces.
- Strictly adhere to international standards by prohibiting child labor and forced labor.

7.2.6.2 Operation Phase

The responsibilities determined for the construction period, regardless of the number of employees, will also apply to the operation phase in accordance with LM Plan, LMP, ILO conventions, and national legislation. Details of the key mitigation measures for operation phase for potential E&S impacts related to labor conditions are given in Table 1.

To mitigate potential E&S impacts related to labor conditions training programs will be implemented during construction and operation phase to cover requirements of ESS2. Items will be provided under training programs are occupational health and safety, labor conditions, GM, GBV and SEA/SH. All the staff should participate in these training sessions. Trainings will be conducted by the assigned experts of the Project owner and contractor. Besides, Consultant (ÇINAR) will conduct ESMP training session prior to construction activities. Outputs of the provided trainings such as training records will be monitored by the Project owner.

7.2.7 Community Health and Safety

7.2.7.1 Construction Phase

Public health and safety issues are associated with risk factors that may arise from the construction phase of the Project. It is anticipated that employees/visitors of the nearby/ adjacent facilities will be particularly affected by noise and dust generated during the construction phase. Dust and noise impacts will be particularly intense during panel installation.

Traffic activities are expected to intensify during the supply of materials during the construction phase. All necessary Occupational Health and Safety (OHS) measures will be taken to ensure that local people are not adversely affected by the Project. The Project Owner and the Contractor will comply with the mitigation measures specified in this ESMP.

In addition, the Contractor will take necessary health and safety measures during site preparation and construction activities under the direction of the Project Owner, such as using appropriate warning signs and signage and dust suppression during dry seasons. In the course of project activities, special and careful attention will be paid to taking and

implementing mitigation measures that will ensure the highest level of life safety for the people and workers in the region.

User of the facilities in the vicinity of the project area may be exposed to physical hazards associated with project components during the construction phase. In addition, confined spaces or fall hazards may occur due to unattended infrastructure. To prevent physical hazards to communities associated with the Project, the Project area will be fenced with appropriate equipment and construction activities will be announced at least two (2) days in advance to affected employees/visitors of the nearby/adjacent facilities . During the operation phase of the Project, all works such as maintenance etc. do not pose any risk.

All the staff should participate in training sessions which include grievance mechanism, prevention of gender-based violence, sexual exploitation and abuse, sexual harassment. Besides, Consultant (ÇINAR) will conduct ESMP training session prior to construction activities.

7.2.7.2 Operation Phase

Some personnel will be responsible for maintenance and cleaning of SPP but they are not permanent personnel. These personnel will come through external service procurement. The management of the SPP will be carried out by the current electrical engineer of the OIZ. No additional personnel will be employed for the operation phase. There will be no interaction with the local community. Considering the distance of the project area from settlements, it is not expected to have interaction with local communities.

Project area will be surrounded by barriers and fences and necessary warning signs will be hung.

Maintenance and cleaning of the SPP will be carried out by non-permanent personnel contracted through external service providers. The maintenance and repair contractor will enter the project area only for maintenance and repair activities. In case of failure, maintenance and repairs will be carried out by taking the necessary OHS measures on the relevant section.

7.2.8 Traffic and Transportation

7.2.8.1 Construction Phase

It is anticipated that no significant additional load will be of concern, considering that totally seven (7) construction machineries will enter the project area during the construction works to be carried out within the scope of the project. Existing traffic load assessments are detailed in Section 6.9.

The vehicles that will operate during the construction phase of the project are given in Table 19. Among these vehicles, it is foreseen that only the truck will use the transportation roads. Since the other vehicles will operate in the project area, they will not leave the Gümüşhane OIZ unless necessary.

The times when the traffic density is low should be preferred, and the necessary warning signs should be placed for the special link road. The personnel operating vehicles and heavy equipment will be dedicatedly assigned and that they will be provided with traffic and road safety training. The maintenance of the construction machinery and equipment will be carried out regularly and regulatory speed limitations will be followed for construction vehicles, and this should be included in the project area, transport and traffic management plan to be prepared by the Contractor.

Prior to construction activities, the Contractor will install all signs, barriers and control devices needed to ensure the safe use of the road by traffic and pedestrians, as required by the transport and traffic management plan to be prepared.

7.2.8.2 Operation Phase

There will be no vehicle/work machine use during the operation phase of the project. Only vehicles belonging to the maintenance service will visit the sites at regular intervals. Necessary OHS measures will be taken during maintenance operations (see Section 8). In this context, no impact on traffic is expected during the operation phase.

7.2.9 Occupational Health and Safety

The planning to be made in the project before the installation of solar power plants and the occupational health and safety measures taken accordingly are important to prevent accidents that may occur during the installation phase of solar power plants. The dangers identified before the installation phase, the risk contained in the concept of danger and factors that these risks are related to are completely prevented or the incidents that cannot be prevented are in direct proportion to the measures to be taken. Occupational health and safety measures have adopted a proactive approach rather than a reactive approach, depending on the experiences and highlighted this approach. Compliance with the planned measures will be continuously monitored during the installation, i.e., construction phase, and during the operation phase. In this context, work will be carried out in accordance with the international standards (see Section 3) and national OHS legislation (see Annex-6).

7.2.9.1 Pre-Construction Phase

Before commencing the construction phase, a Health and Safety Plan will be prepared by contractor[30]. The Health and Safety Plan should take into account national and international practices and encompass all necessary instructions. The Health and Safety Plan is a document prepared or ensured to be prepared by the responsible employer, project supervisor or project coordinator for the entire construction site to coordinate health and safety matters among different employers, subcontractors, self-employed individuals, and various work teams operating in the same construction area. It defines the assessment of potential risks and determines when and by whom health and safety measures, organizational structure, work methods, and related tasks should be implemented throughout the construction process.

The contractor is responsible for identifying and controlling hazards in every area, from the preparation phase of the work to the delivery phase, in all areas where the workers are involved. Additionally, mitigation measures for the pre-construction Table 27.

7.2.9.2 Construction Phase

Excavation works will be carried out for the project. To ensure the monitoring and sustainability of occupational health and safety issues during construction, it is necessary to establish an OHS unit. This team will consist of an occupational physician conducting periodic health examinations for the employees working during the construction phase, one (1) assistant health personnel to support them, and a full-time OHS Expert, Class A.

A Risk Assessment will be conducted to identify existing or potential hazards within the workplace, both internal and external, analyze and rank risks arising from these hazards by considering factors leading to their occurrence, and determine control measures.

Risk assessment is conducted by a team formed by the contractor. The Risk assessment team consists of the following.

- Employer or employer's representative.

[30] **Source:** 05.10.2103 dated 28786 numbered Regulation on Occupational Health and Safety in Construction Works" Article-8

- Occupational safety specialists and workplace physicians providing health and safety services at the workplace.
- Employee representatives at the workplace.
- Employees designated to represent all units at the workplace and who possess knowledge about ongoing activities, existing or potential hazards, and risks within the workplace.

The completion of a risk assessment does not exempt the employer from the obligation to ensure occupational health and safety in the workplace. Furthermore, the employer provides the individuals tasked with risk assessment with any necessary information and documents related to risk assessment.

The emergency plan should be prepared by the contractor following stages starting from the design or establishment phase for all workplaces by contractor. These stages include identifying emergencies, taking preventive, and limiting measures against their adverse effects, determining designated individuals, establishing emergency intervention and evacuation methods, documentation, conducting drills, and renewing the emergency plan.

Additionally, a project-specific emergency action plan will be developed, and drills will be scheduled. Possible emergencies in the workplace are determined based on the results of risk assessments, taking into account the following and similar aspects:

- Probability of fire and explosion.
- Probability of dissemination, poisoning, and outbreak of diseases caused by hazardous chemicals, biological, radioactive, and nuclear materials.
- Probability of natural disasters occurring.
- Probability of sabotage.

The Health and Safety Plan, Risk Analysis Report, and Emergency Action Plan should be prepared in accordance with the relevant regulations and include communicable diseases precautions.

During the construction phase, the contractor will have an OHS expert on-site. Throughout the construction period, hazards that may arise will be identified, and new risks will be analyzed, leading to the regular updating of the Risk Analysis Report. All employees involved in the construction will be provided with Personal Protective Equipment (PPE) and will receive appropriate training. Since the work primarily involves assembly, qualified labor will be employed.

Employees working in the construction phase will be engaged in tasks involving working at heights, assembly. Within this scope, employees must utilize the following protective equipment: head protection (helmets compliant with TS EN 397+A1 standards), foot protection (shoes compliant with TS EN ISO 20345 standards), protective gloves (compliant with TS EN 388 and TS EN 420 standards), eye protection (compliant with TS 5560 EN 166 standards), fall protection equipment (must comply with all EN 361 parachute-type harness, EN 354 lanyard, EN 355 shock absorber, EN 362 connector standards), and workwear (compliant with TS EN ISO 13688 and TS EN ISO 20471 standards).

Work will not be permitted during rainy or windy weather conditions. Additionally, during assembly, there may be a risk of heat stroke depending on the season.

All employees involved in the construction phase will receive Human Resources training upon entry, basic OHS training, emergency response training, and basic first aid training. The selected employees for the first aid certificate will receive a separate “first aid training”. Pre- and post-training assessments will be conducted, and in cases where the training is deemed insufficient, it will be repeated. Specific training will be provided to employees working at heights. As per TS 13885 standards, individuals attending training for working at heights must be over 18 years old and possess a health report confirming suitability for the

training. Prior to commencing work at heights, a work permit form will be issued, and work will only proceed once appropriate conditions are ensured.

Additionally, mitigation measures for the construction phase are given in Table 28.

7.2.9.2.1 Permit to Work

A work permit system must be implemented to ensure that certain high-risk tasks are carried out safely. The following tasks must require a work permit: confined space work, working at heights, hot works (e.g., welding, cutting), electrical works, handling of hazardous chemicals, excavation activities, and heavy equipment operation.

During the installation of SPP, a work permit system must be applied to ensure that high-risk tasks are performed safely. The activities requiring work permits must include:

- Working at heights
- Electrical works
- Hot works (e.g., welding, cutting, if required)
- Heavy equipment operation
- Excavation works

These tasks must be assessed in advance to minimize occupational health and safety risks, and the required permit forms must be completed and approved by authorized personnel. The work permit process must be monitored and audited at each stage of the activity to ensure that safety measures are implemented and maintained.

7.2.9.2.2 Working at height

Special precautions will be taken for work at height:

- The areas where work will be carried out should be of sufficient strength and durability, taking into account factors such as the working personnel, the maximum weight they may carry, and the distribution of this weight. It is essential to ensure that the supporting systems and other components of these work areas are structurally sound.
- Before commencing work at heights, it is crucial to check for any hazards or risks posed by energy transmission lines or other potential danger sources in the area. Work should only begin once these hazards have been eliminated or mitigated.
- Depending on the nature of the work being performed at heights, only personnel who are both qualified and experienced in working at heights and are in good health should be assigned to such tasks.
- Safe access to work areas should be provided for employees, along with appropriate ascent and descent equipment and tools.
- The safety of workers in work areas should primarily be ensured through collective protection measures such as safety railings, fall prevention platforms, barriers, covers, work scaffolds, safety nets, or airbags.
- In cases where collective protection measures cannot be implemented, and the risk of falling cannot be entirely eliminated, lifelines should be installed, and full-body harness systems (parachute-type safety harness) or similar safety systems should be used.
- Workers in these areas should be informed about the hazards and risks associated with working at heights and should receive the necessary training.
- Work at heights should be carried out under the supervision and control of a competent person appointed by the employer.
- Measures should be taken to prevent the falling of hand tools and other materials used in work at heights.

- Waste materials or surplus items generated during work at heights should not be dropped directly to the ground from any height. Instead, they should be lowered down in a balanced and safe manner and properly stored in a suitable location. Safe methods for waste material removal, such as chute systems, should be preferred.
- Personnel without parachute-type safety harnesses or working in areas without a lifeline will not have their work permits approved, and they will not be allowed to work.

7.2.9.2.3 Working with chemicals

Chemical hazards denote the potential for sickness or injury arising from either a single acute exposure or repeated chronic exposure to substances that are toxic, corrosive, sensitizing, or oxidative. There is also a risk of uncontrolled reactions, such as fire and explosion, if incompatible chemicals are unintentionally mixed. The most effective prevention of chemical hazards involves a hierarchical approach encompassing the following strategies:

- Substituting the hazardous substance with a less harmful alternative.
- Implementing engineering and administrative controls to prevent or minimize the release of hazardous substances into the work environment, thereby maintaining exposure levels below internationally established limits.
- Minimizing the number of employees exposed or likely to be exposed.

During the construction phase, the use of chemical substances is not of a concerning magnitude. However, in cases where working with chemical substances is necessary:

The Health and Safety (H&S) Unit will conduct assessments related to the chemicals used, and hazard cards will be created. These hazard cards, along with Safety Data Sheet (SDS) and, will be posted at accessible points in areas where chemicals are stored and used. Personnel working with chemicals will be provided with suitable equipment and PPE in accordance with the working conditions and the chemicals, and the procurement and stock process will be overseen by the respective departments.

7.2.9.2.4 Fire and Explosion

To prevent the risks of ignition, explosion, and fire, avoidance, reduction, engineering controls, and other internationally accepted control methods will be implemented.

In solar energy construction projects, internationally recognized control methods and engineering measures for fire detection, containment, and extinguishing are paramount. Within these initiatives, various safety precautions must be implemented to mitigate the risk of fire and ensure effective response in the event of a fire outbreak. Specialized detection systems such as thermal and smoke detectors can be employed for fire detection in solar energy systems. Additionally, fire suppression technologies like automatic sprinkler systems or CO_2-based extinguishing methods may be favored. Engineering measures encompass system isolation, material selection, and assembly standards aimed at minimizing fire hazards. All these measures play a crucial role in ensuring the safety of personnel and facilities involved in solar energy construction.

Employees will be trained on what to do in emergency situations, team responsibilities and coordination, and the management and execution of operations within the scope of the emergency response plan.

7.2.9.2.5 Noise

During the construction phase, the source of noise is the work equipment. The contractor should consider the noise emission characteristics of equipment when selecting equipment for the project and select the least noisy machine available to perform the specific work. Employees should be provided with ear protection (PPE) to prevent them from being harmed by the noise.

Every employee who will work in areas with a noise level of 80 dB(A) or higher should receive training before starting work. This training should cover the potential effects of noise on hearing, the purpose of ear protectors, their advantages and disadvantages, proper usage, determining the appropriate type of protection, maintenance, and cleaning. Hearing protectors (PPE) should be distributed to employees. These training sessions should be renewed annually. Additionally, regular annual examinations and audiometric tests should be conducted for employees before and after employment to monitor potential hearing damage.

Exposure action values and exposure limit values to be complied with throughout the construction phase are provided below according to the relevant legislation[31].

- Minimum exposure action values: 80 dB(A). When the ambient noise level reaches 80 dB(A), hearing protectors (PPE) should be readily available.
- Maximum exposure action values: 85 dB(A). The effect of ear protectors is not considered in exposure action values. When the ambient noise level reaches 85 dB(A), hearing protectors (PPE) must be used.
- Exposure limit values: 87 dB(A). When applying exposure limit values, the protective effect of the personal hearing protection devices used by employees is also taken into account when determining the employee's exposure.

7.2.9.2.6 Vibration

During the construction phase, the source of vibration is once again the work equipment. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be carried out. Additionally, working hours for employees will be organized.

Exposure action values and exposure limit values to be complied with throughout the construction phase are provided below according to the relevant legislation[32].

For hand-arm vibration:

- Daily exposure limit value for an eight-hour working period: 5 m/s².
- Daily exposure action value for an eight-hour working period: 2.5 m/s².

For whole-body vibration:

- Daily exposure limit value for an eight-hour working period: 1.15 m/s².
- Daily exposure action value for an eight-hour working period: 0.5 m/s².

To prevent or reduce exposure;

- Risks originating from exposure to mechanical vibration are eliminated or minimized at the source, considering the feasibility of combating risks with technical developments.
- Compliance with the principles of risk prevention specified in Law No. 6331 is observed for preventing or reducing exposure.
- In case it is determined that the exposure action values mentioned the employer creates and implements an action plan specifically aimed at minimizing exposure to mechanical vibration and the risks it may cause, considering the following aspects.
  - Choosing alternative working methods that reduce exposure to mechanical vibration.
  - Selecting ergonomically designed appropriate work equipment that generates the lowest possible level of vibration considering the performed task.

[31] **Source:** 28.07.2013 dated 28721 numbered Regulation on Protection of Employees from Risks Related to Noise

[32] **Source:** 22.08.2013 dated 28743 numbered Regulation on Protection of Employees from Risks Related to Vibration

- Providing auxiliary equipment such as seating that effectively reduces whole-body vibration exposure, handholds that reduce transmitted vibration to the hand-arm system, and similar equipment to reduce exposure to vibration.
- Implementing appropriate maintenance programs for the workplace, workplace systems, and work equipment.
- Designing and arranging the workplace and working environment appropriately.
- Providing necessary information and training to employees on using work equipment correctly and safely to reduce exposure to mechanical vibration.
- Limiting the duration and level of exposure.
- Regulating working hours with adequate rest periods.

7.2.9.2.7 Rotating and Moving Equipment

Injury or death can occur from unexpected starting of equipment or unapparent movements during operations, leading to entanglement, trapping, or impact on machine parts. Designing machines to eliminate trap hazards and preventing extremities from harm under normal operating conditions. Examples of proper design considerations include two-hand operated machines to prevent amputations, or the availability of emergency stops dedicated to the machine and strategically positioned.

If a machine or equipment has an exposed rotating part or an open pinch point that could jeopardize the safety of any worker, the machine or equipment should be equipped with a guard or another device that prevents access to the rotating part or pinch point. Guards should be designed and installed in accordance with appropriate machine safety standards.

The rotating components of machinery and lifting equipment used during material handling, as well as the rotating parts of hand tools that may be used during the assembly phase, can pose potential hazards. It is important to adhere to work instructions and prioritize the use of machine guards and PPE during these operations.

7.2.9.2.8 Electrical

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, wires, and hand tools, can pose a serious risk to workers. Overhead wires can be struck by metal devices like poles, ladders, or vehicles with metal booms. Vehicles or grounded metal objects in contact with overhead wires can create an arc between the wires and the object without actual contact. All energized electrical devices and lines must be marked with warning signs. Check all electrical cords, cables, and hand power tools for frayed or exposed wires, and follow the manufacturer's recommendations for the maximum permitted operating voltage of portable hand tools. Double insulating / grounding all electrical equipment used in environments that are, or may become, wet; using equipment with ground fault interrupter protected circuits Power cords and extension cords should be shielded or suspended above traffic areas to protect against damage from traffic. Rubber tired construction or other vehicles that come into direct contact with, or create arcing between, high-voltage wires may need to be taken out of service for periods of 48 hours and have their tires replaced to prevent catastrophic tire and wheel assembly failure, potentially causing serious injury or death.

7.2.9.2.9 Welding / Hot Work

The welding process can generate extremely bright and intense light, posing a serious risk to a worker's eye health and, in extreme cases, leading to blindness. Additionally, prolonged exposure to the welding process can produce harmful fumes, potentially causing severe chronic illnesses. During the construction phase, if welding is required during assembly, there are important considerations to follow.

All employees involved in or assisting with welding must adhere to the work instructions. Proper eye protection, such as welding goggles and/or a full-face eye shield, must be

provided for all personnel participating in or assisting with welding operations. Devices to extract and remove harmful fumes at the source may also be necessary. Paying attention to the use of PPE is crucial to reduce exposure to harmful fumes.

Working Environment Temperature

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injuries or death. The use of PPE for protection against other occupational hazards may accentuate and exacerbate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided, and engineering controls and ventilation practices should be implemented for this purpose. In cases where this is not feasible, as in the assembly of the project, the following precautions should be taken:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly.
- Adjustment of work and rest periods based on temperature stress management procedures provided, considering both temperature and workload.
- Providing temporary shelters to protect against the elements during working activities or for use as a rest area.
- Use of protective clothing.
- Ensuring easy access to adequate hydration, such as drinking water or electrolyte drinks.

7.2.9.2.10 Ergonomics, Repetitive Motion, Manual Handling

Injuries caused by ergonomic factors, such as repetitive motion, overexertion, and manual handling, develop with prolonged and repeated exposures, typically requiring weeks to months for recovery. These OHS issues should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Designing facilities and workstations with consideration for operational and maintenance workers ranging from the 5th to the 95th percentile.
- Using mechanical aids to eliminate or reduce the exertion required for lifting materials, holding tools and work objects, and implementing multi-person lifts if weights exceed set thresholds.
- Selecting and designing tools that decrease force requirements and holding times while improving postures.
- Providing user-adjustable workstations.
- Incorporating rest and stretch breaks into work processes and implementing job rotation.
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.
- Considering additional special conditions, such as those applicable to left-handed individuals

7.2.9.2.11 Over-exertion

Over-exertion, ergonomic injuries, and illnesses such as repetitive motion, excessive effort, and manual handling are among the most common causes of injuries in constructions. To prevent and control these, construction workers should be trained in lifting and material handling techniques. Weight limits requiring mechanical assistance, or two-person lifts should be determined and communicated to the workers. Additionally, planning the layout of the work area to minimize the need for manual handling of heavy loads is essential.

7.2.9.2.12 Slips and Falls

Slips and falls on the same level associated with poorly organized work areas, especially due to factors like excessive waste material, loose construction materials, liquid spills, and

uncontrolled electrical cables and ropes on the ground, are among the common workplace accidents in construction. Methods to prevent slips and falls on the same level include:

- Implementing good organization practices, such as arranging waste materials or demolition debris in designated areas away from pedestrian paths
- Regularly cleaning up excessive waste material and liquid spills
- Positioning electrical cables and ropes in common areas and marked corridors
- Using slip-resistant footwear

7.2.9.2.13 Excavation Works

Excavation work will be carried out for the transformer building within the scope of the construction of the ground-mounted SPP. During this excavation work, the following issues must be complied with:

- Work permits should be obtained before commencing work involving excavation.
- The areas designated for excavation should only be accessible to authorized personnel. Loading activities should be conducted under the supervision of personnel overseeing the operations.
- Excavation areas should be enclosed with barriers, marked with signs, and entry to excavated areas without implementing collapse prevention measures should be prohibited.
- Excavation work should be halted during windy or rainy weather.
- The contractor will ensure that the exhaust of the machinery used in excavation works is equipped with silencers (where possible)
- Construction vehicles and machinery will be well maintained and not kept idling when not in use.
- Earplugs should be provided for workers placed in high noise areas.
- During the construction phase, the source of vibration is the work equipment (especially pilling machine). All body vibration values of the equipment in use should be measured. If the measured value exceeds the exposure action value of 0.5 m/s², preventive measures should be taken. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be conducted. Additionally, the working hours of employees will be adjusted.
- Employees should use machinery, equipment, vehicles, tools, hazardous substances, transportation devices, and other production tools in accordance with regulations, correctly utilize their safety features, and refrain from arbitrarily removing or altering them.
- Employees should immediately inform the employer or a representative if they encounter a serious and immediate health or safety hazard in machinery, equipment, vehicles, tools, facilities, or buildings in the workplace, or if they detect any deficiencies in protective measures.
- No one shall operate or use construction machinery unless the contractor is adequately competent and reliable, informed about the risks associated with the operation, and subjected to regular medical examinations.
- The employee who will operate work equipment will possess a G-class driver's license, a psychotechnical report, a defensive driving certificate, and a professional competency training document (SRC (Driver) certificate).
- The contractor will ensure that no person is engaged in driving or operating construction machinery unless he/she is sufficiently competent and reliable, possesses the knowledge of risks involved in the operation and is medically examined periodically.
- Never should one stand behind construction machinery, and never should one stand under suspended loads.

- One should avoid working close to moving objects and should be careful of their surroundings, especially if those objects do not have lights or beepers.
- Always ensure that there is a flagman to guide vehicles.

7.2.9.2.14 Animal Bites and Stings

During the construction of the ground-mounted SPP, there is a potential risk of bites or stings from animals such as snakes and scorpions. The measures to be taken against this risk are outlined below.

- It is essential to identify animals that may pose a risk of bites or stings, such as snakes, scorpions, and ticks. Information regarding protective measures and medical interventions should be gathered, and construction workers should be informed on this issue.
- Measures taken by local health institutions regarding poisonous animals in the area should be verified (e.g., availability of antivenom).
- To protect against bites and stings, long pants, long socks, and long-sleeved clothing should be worn. Pant legs should ideally be elasticized to prevent snakes and insects from entering.
- Hands should not be placed in areas where snakes, scorpions, spiders, etc., might be hiding.
- If work shoes and clothing need to be removed and then worn again in the project area, they should be checked for snakes, scorpions, or spiders before putting them on.
- Behavior that may startle, frighten or threaten an animal must be avoided. Personnel who are bitten or stung by an animal should be immediately directed to health institutions.

7.2.9.3 Operation Phase

During the operation phase of the project, there will be only maintenance and repair activities. There is a risk of electric shock during transformer maintenance and repair. For this reason, maintenance and repair operations will be carried out by experts. Warning signs regarding electrical hazards will be posted. Additionally, mitigation measures for the operation phase are given in Table 29.

7.2.9.3.1 Permit to Work

A work permit system must be implemented to ensure that certain high-risk tasks are carried out safely. The following tasks must require a work permit: confined space work, working at heights, hot works (e.g., welding, cutting), electrical works, handling of hazardous chemicals, excavation activities, and heavy equipment operation. During the operation phase of SPP, a work permit system must be applied to ensure that high-risk tasks are performed safely.

These tasks must be assessed in advance to minimize occupational health and safety risks, and the required permit forms must be completed and approved by authorized personnel. The work permit process must be monitored and audited at each stage of the activity to ensure that safety measures are implemented and maintained.

7.2.9.3.2 Electrical

Exposed or faulty electrical devices, such as circuit breakers, panels, cables, cords, and hand tools, can pose a serious risk to workers.

All energized electrical devices and lines need to be marked with warning signs.

During maintenance or service, devices should be locked out (discharged and left open with a controlled locking device) and tagged out (warning sign placed on the lock).

All electrical cords, cables, and hand power tools should be checked for frayed or exposed cords, and portable hand tools should follow the manufacturer's recommendations for the maximum permitted operating voltage.

Electrical equipment used in wet or potentially wet environments should be double insulated/grounded, and equipment with ground fault interrupter protected circuits should be used.

Service rooms housing high-voltage equipment ('electrical hazard') and areas with controlled or prohibited entry should be appropriately labeled, and warning signs should indicate areas where entry is controlled or prohibited.

LockOut/TagOut, which is the locking and tagging method applied to prevent any unexpected operation of a machine or device or the discharge of hazardous substances from a line that may cause harm to employees, should be implemented. This aims to minimize workplace accidents due to electric shock. Maintenance repair teams will receive training and guidance from an Occupational Health and Safety (OHS) expert to identify hazards and risks related to their work. Personnel performing maintenance and repairs are required to possess an EKAT (High Voltage Electrical Facilities) certificate[33]. During the operation phase of the project, there will be no permanent employment as there will be work only during maintenance and repair.

For the maintenance team, the PPE (Personal Protective Equipment) should include an electrician's helmet (EN 397+A1 and EN 50365 Class 0), electrician's footwear (EN 20345), electrician's gloves (EN 1149-1/2), and protective clothing against electric arcs. Additionally, the use of insulating mats and insulated hand tools is necessary.

7.2.9.3.3 Working at height

Fall prevention and protection measures should be implemented whenever a worker is exposed to the hazard of falling more than two meters; through an opening in a work surface. Fall prevention/protection measures may also be required for specific situations when there are risks of falling from lower heights. According to national regulations, all areas with level differences are considered hazardous, posing a risk of falling. Special precautions will be taken for working at height during cleaning and repair/maintenance of solar panels.

- It is necessary to install guardrails with mid-rails and toe boards at the edge of any fall hazard area.
- The use of fall prevention devices, including safety belts and lanyard travel limiting devices to prevent access to the fall hazard area, or fall protection devices such as full-body harnesses used in conjunction with shock-absorbing lanyards or self-retracting inertial fall arrest devices attached to a fixed anchor point or horizontal lifelines, should be considered.
- Appropriate training should be provided on the use, functionality, and integrity of the necessary personal protective equipment (PPE).
- Rescue and/or recovery plans and equipment should be included in responding to workers after an arrested fall.
- The areas where work will be carried out should be of sufficient strength and durability, taking into account factors such as the working personnel, the maximum weight they may carry, and the distribution of this weight. It is essential to ensure that

[33] **Source:** Electric Power Current Facilities Regulation, which was published in the Official Gazette dated 30.11.2000 and numbered 24246.

the supporting systems and other components of these work areas are structurally sound.

- Before commencing work at heights, it is crucial to check for any hazards or risks posed by energy transmission lines or other potential danger sources in the area. Work should only begin once these hazards have been eliminated or mitigated.
- Depending on the nature of the work being performed at heights, only personnel who are both qualified and experienced in working at heights and are in good health should be assigned to such tasks.
- Safe access to work areas should be provided for employees, along with appropriate ascent and descent equipment and tools.
- The safety of workers in work areas should primarily be ensured through collective protection measures such as safety railings, fall prevention platforms, barriers, covers, work scaffolds, safety nets, or airbags.
- In cases where collective protection measures cannot be implemented, and the risk of falling cannot be entirely eliminated, lifelines should be installed, and full-body harness systems (parachute-type safety harness) or similar safety systems should be used.
- Workers in these areas should be informed about the hazards and risks associated with working at heights and should receive the necessary training.
- Work at heights should be carried out under the supervision and control of a competent person appointed by the employer.
- Measures should be taken to prevent the falling of hand tools and other materials used in work at heights.
- Waste materials or surplus items generated during work at heights should not be dropped directly to the ground from any height. Instead, they should be lowered down in a balanced and safe manner and properly stored in a suitable location. Safe methods for waste material removal, such as chute systems, should be preferred.
- Personnel without parachute-type safety harnesses or working in areas without a lifeline will not have their work permits approved, and they will not be allowed to work.

7.2.9.3.4 Working with chemicals

During the operation phase of the Project, the use of chemical substances is not of a concerning magnitude. However, in cases where working with chemical substances is necessary, the H&S Unit will conduct assessments related to the chemicals used, and hazard cards will be created. These hazard cards, along with Safety Data Sheets (SDS) will be posted at accessible points in areas where chemicals are stored and used. Personnel working with chemicals will be provided with suitable equipment and PPE in accordance with the working conditions and the chemicals, and the procurement and stock process will be overseen by the respective departments.

7.2.9.3.5 Fire and Explosion

Electrical equipment is the main source of a potential fire hazard. In the event of fire catching a solar module, it is theoretically possible for hazardous fumes to be released, and inhalation of these fumes could pose a risk to human health.

Leaching of materials from broken or fire damaged PV modules. The potential for chemical releases appears to be small since the chemicals are present in the sealed PV modules when completed installations of photovoltaic systems for power generation. Releases are likely to occur only due to fires or other unusual accidents. Cadmium could be a potential concern in this setting with thin-film technologies, as would arsenic and zinc to a lesser extent. Other chemicals that have inhalation toxicity factors are present only during the manufacturing process. Solar PV modules may contain heavy metals like lead, mercury,

cadmium, chromium, polybrominated biphenyls (PBBs), or brominated diphenyl ethers (PBDEs) etc.

7.2.9.3.6 *Noise*

During the operational phase, no significant noise that could harm the workers is expected.

7.2.9.3.7 *Vibration*

During the operational phase, no significant vibration that could harm the workers is expected.

7.2.9.3.8 Welding / Hot Work

Exposure to hot or cold working conditions in indoor or outdoor environments can result in temperature stress-related injuries or death. The use of PPE for protection against other occupational hazards may accentuate and exacerbate heat-related illnesses. Extreme temperatures in permanent work environments should be avoided, and engineering controls and ventilation practices should be implemented for this purpose. In cases where this is not feasible, as in the maintenance of the project, the following precautions should be taken:

- Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly.
- Adjustment of work and rest periods based on temperature stress management procedures provided, considering both temperature and workload.
- Providing temporary shelters to protect against the elements during working activities or for use as a rest area.
- Use of protective clothing.
- Ensuring easy access to adequate hydration, such as drinking water or electrolyte drinks.

7.2.9.3.9 Ergonomics, Repetitive Motion, Manual Handling

Injuries caused by ergonomic factors, such as repetitive motion, overexertion, and manual handling, develop with prolonged and repeated exposures, typically requiring weeks to months for recovery. These occupational health and safety (OHS) issues should be minimized or eliminated to maintain a productive workplace. Controls may include:

- Designing facilities and workstations with consideration for operational and maintenance workers ranging from the 5th to the 95th percentile.
- Using mechanical aids to eliminate or reduce the exertion required for lifting materials, holding tools and work objects, and implementing multi-person lifts if weights exceed set thresholds.
- Selecting and designing tools that decrease force requirements and holding times while improving postures.
- Providing user-adjustable workstations.
- Incorporating rest and stretch breaks into work processes and implementing job rotation.
- Implementing quality control and maintenance programs that reduce unnecessary forces and exertions.
- Considering additional special conditions, such as those applicable to left-handed individuals

7.2.9.3.10 Over-exertion

Over-exertion, ergonomic injuries, and illnesses such as repetitive motion, excessive effort, and manual handling are among the common causes of injuries in maintenance. To prevent and control these, workers should be trained in lifting and material handling techniques. Weight limits requiring mechanical assistance, or two-person lifts should be determined and

communicated to the workers. Additionally, planning the layout of the work area to minimize the need for manual handling of heavy loads is essential.

7.2.9.3.11 Slips and Falls

Slips and falls on the same level associated with poorly organized work areas, especially due to factors like excessive waste material, liquid spills, and uncontrolled electrical cables and ropes on the ground, are among the common workplace accidents in maintenance. Methods to prevent slips and falls on the same level include:

- Implementing good organization practices, such as arranging waste materials or demolition debris in designated areas away from pedestrian paths
- Regularly cleaning up excessive waste material and liquid spills
- Positioning electrical cables and ropes in common areas and marked corridors
- Using slip-resistant footwear

7.2.9.3.12 Animal Bites and Stings

During the maintenance and repair activities of the ground-mounted SPP, there is a potential risk of bites or stings from animals such as snakes and scorpions. The measures to be taken against this risk are outlined below.

- It is essential to identify animals that may pose a risk of bites or stings, such as snakes, scorpions, and ticks. Information regarding protective measures and medical interventions should be gathered, and construction workers should be informed on this issue.
- Measures taken by local health institutions regarding poisonous animals in the area should be verified (e.g., availability of antivenom).
- To protect against bites and stings, long pants, long socks, and long-sleeved clothing should be worn. Pant legs should ideally be elasticized to prevent snakes and insects from entering.
- Hands should not be placed in areas where snakes, scorpions, spiders, etc., might be hiding.
- If work boots and clothing need to be removed and then worn again in the field, they should be checked for snakes, scorpions, or spiders before putting them on.
- Behavior that may startle, frighten or threaten an animal must be avoided. Personnel who are bitten or stung by an animal should be immediately directed to health institutions.

8. ENVIRONMENTAL AND SOCIAL ASPECTS, AND BEST PRACTICE MITIGATION MEASURES

The E&S baseline and E&S risks and impacts are presented in Section 6 & Section 7 and considered for the assessment of the best practice mitigation measures defined for the project. Most stringent among national legislation and WB standards and most up-to-date legislation will be complied with within the scope of the project.

The mitigation plans prepared for the pre-construction, construction and operation phases are presented in Section 8.1, 8.2 and Section 8.3.

This section presents cost effective and feasible measures to reduce adverse environmental and social impacts to acceptable levels. The mitigation measures in addition to the standard mitigation measures listed above are presented in Table 27, Table 28 and Table 29. During the implementation of the mitigation plan, project standards as described in Chapter 3 will be complied with.

8.1 Mitigation Plan for the Pre-Construction Phase

Table 27. Mitigations for the Pre-construction Phase

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
PR-GN-01	Disclosure	Insufficient information	Medium	• The information on the start and finish dates of construction and working periods and the permits obtained from the provincial/district municipality and other relevant institutions/organizations (if necessary) will be shown by the contractor in a signboard that is easily visible to all personnel at the construction site. • Before the start of construction works, the local people and all relevant internal and external stakeholders will be informed of the works to be performed and the measures to be taken through stakeholder consultation meeting by project owner. • The draft ESMP will be subject to public consultations, and the finalized ESMP will be public disclosed.	Low	Included in construction costs	Implementation: Project Owner
PR-GN-02	Permits and Pre-design	Lack of legal permits and project management	Low	• EIA Exemption Letter has been received for the project. Apart from this, the project should not be started before the necessary static calculations, ground survey studies, etc. related to the project design are completed. Project design is responsibility of Design Consultant.	Low	To be included in design costs	Implementation: Design Consultant Monitoring: Project Owner
PR-OHS-01	Occupational Health and Safety	Accidents and injuries resulting from incorrect conditions or behaviors	High	• Prior to the construction activities of the projects, consultations, assessments and plans regarding occupational health and safety (OHS Plan, Risk Assessment and Emergency Response Plan) and labor management and working conditions will be made by the contractor and shared with OIZ to prevent or, if unavoidable, reduce to an acceptable level every potential risk factor that may arise during installation. • OHS Plan, risk assessment and emergency response plan will be prepared by contractor. • OIZ Project Management Unit will guide the work to be carried out by the Contractor regarding OHS issues.	Low	Included in construction costs	Implementation: Contractor Monitoring: Project Owner
PR-OHS-02	Community Health and Safety	Access from outside and accidents that may occur due to lack of security of the project area	High	• The perimeter of the construction areas (i.e. SPP areas) will be enclosed with a fence/curtain, etc. • Warning signs will be hung. • All the staff should undergo training sessions which include OHS, grievance mechanism, gender-based violence, sexual exploitation and abuse, sexual harassment. Also ESMP training from consultant (ÇINAR) will be conducted. • Traffic planning will be conducted.	Low	Included in construction costs	Implementation: Contractor Monitoring: Project Owner
PR-SE-01	Stakeholder Engagement	Insufficient stakeholder engagement activities and public consultation	Medium	• The draft E&S instruments will be disclosed both on OIZ's and MoIT's official webpages. • A public/stakeholder consultation meeting will be held following the disclosure of the E&S instruments before the initiation of the tendering process and construction works to disseminate information on the details of the Project and project owner, potential E&S risks and impacts of the proposed subproject and relevant mitigation to be taken to manage these risks and impacts, monitoring activities, stakeholder engagement activities, GM. • •An effective GM will be implemented.	Low	Included in construction costs	Implementation: Project Owner
PR-BIO--01	Plantation Trees	Biodiversity loss, habitat loss	High	• *Pinus nigra* (Austrian pine / Black pine) and *Robinia* pseudoacacia (Black locust) trees will be relocated.	Low	3.000 $	Implementation: Project Owner

8.2 Mitigation Plan for the Construction Phase

Table 28. Mitigations for the Construction Phase

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
CP-WWM-01	Wastewater Management	Soil and water pollution caused by wastewater generation due to improper practices during the construction phase	Medium	• Operations such as construction machinery and vehicle washing will not be carried out in the project area. • Environmental permit of WWTP must be obtained. • Activities should not affect the availability of water for drinking and hygienic purposes. • The mobile toilets with their own reservoirs will be used during the construction phase, or a leak-proof septic tank will be constructed by the OIZ. In both options, the collected wastewater will be extracted with vacuum trucks and transferred to the OIZ's WWTP. If required, the nearest licensed wastewater treatment plant, the Gümüşhane Municipality WWTP, can be utilized under a protocol/agreement with the Municipality.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-AQM-01	Air Quality Management	Air pollution due to dust and exhaust gas emissions	Medium	• Minimize dust from exposed work sites by applying water on the ground regularly during dry season. • Air emission levels will comply with project standards. • Workers will be trained on the management of air emissions. • Grievance mechanism will be maintained. • Dust measurements (if needed) will be carried out by an authorized laboratory in case of any complaints from the nearest stakeholders regarding dust generation. If the measured levels indicate possible pollution from the project, additional mitigation measures will be developed for the areas where most of the dust is generated, such as windbreaks and barriers, protective covers or curtains. • Trucks will be covered with tarpaulins to reduce dust emission during transportation of excavation waste/soil or similar material. • It will be ensured that the periodic inspections and maintenances of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements. • Construction work will not start at the same time to reduce dust generation. • Avoid burn site clearance debris (trees, undergrowth) or construction waste materials. • Keep stockpile of project materials covered to avoid suspension or dispersal of fine soil particles during windy days or disturbance from stray animals. • Reduce the operation hours of generators /machines /equipment /vehicles. • Control vehicle speed when driving through community areas is unavoidable so that dust dispersion from vehicle transport is minimized.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-NOI-01	Noise	Noise due to vehicles installation works	High	• Works will only be carried out during the day and not at night. • Noise measurements (if needed) will be carried out by an authorized laboratory in case of noise complaints from the nearest stakeholders. • Working hours will be reduced if necessary. • Workers will be trained on noise management. • Grievance mechanism will be kept active. • Project standards on noise level will be complied with. • Machinery and equipment will not be operated simultaneously. • It will be ensured that the periodic inspections and maintenances of the construction machinery and equipment are valid, and they are used in line with the manufacturers' statements. • Plan activities in consultation with communities so that noisiest activities are undertaken during periods that will result in least disturbance. • Use when needed and feasible noise-control methods such as fences, barriers or deflectors (such as planting of fast-growing trees). • Minimize project transportation through community areas. Maintain a buffer zone (such as open spaces, row of trees or vegetated areas) between the project site and residential areas to lessen the impact of noise to the living quarters.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-WM-01	Waste Management	Domestic wastes from workers in the project area	Medium	• Waste management will be carried out in accordance with the "waste hierarchy". • Personnel will be made aware of waste management through trainings. • Domestic wastes will be collected by using waste boxes located in the project buildings. • The Contractor will be responsible for waste management in the project area. The Project Owner will include this issue to the Contractor's contract. Wastes will be sent by the licensed vehicles to licensed disposal/recycling companies contracted by the Contractor. Project Owner will follow up waste management implementations.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-WM-02	Waste Management	Hazardous and non-hazardous wastes from construction activities	Medium	• OIZ must prepare an Industrial Waste Management Plan. • OIZ must establish a storage area for hazardous waste or place hazardous waste containers in the existing area separately from other waste.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring:

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
				• OIZ must place a fire extinguisher in the existing waste storage area. • OIZ must ensure that waste deliveries are made in accordance with the time periods specified in the national legislation (once a year for non-hazardous waste and once every 6 months for hazardous waste). Construction wastes will be segregated as recyclable, hazardous and non-hazardous. • Waste records will be kept regularly. • A temporary hazardous and nonhazardous waste storage area will be established by Contractor. • Boxes/containers will be positioned on site for hazardous and non-hazardous wastes, and wastes will be sent by the Contractor. Stored wastes will be sent to licensed disposal/recycling companies contracted by the Contractor. Project Owner will follow up waste management implementations. • Hazardous and non-hazardous wastes will be stored separately from each other in line with the national and international standards (WB ESSs). • Temporarily stored waste will be labeled with the phrase “hazardous waste” as well as the waste code, the amount of waste stored and the date of storage. • Hazardous waste will be delivered to licensed disposal / recycling facilities by using licensed transportation vehicles. Waste transportation will be carried out with the help of online mobile waste tracking system (MoTAT). Regarding the disposal of hazardous waste, the provisions of the 'Waste Management Regulation' will be complied with. • If different categories of oils are produced from the works at the construction site, these oils will be stored separately. • Containers where waste oils are stored will be kept closed and protected from rainwater. • The maintenance of the construction machinery to be used during the construction phase will be carried out at authorized services. However, if waste accumulators or end-of-life tires are generated in the project area, they will be sent to the Contractor’s waste storage area. • Wastes will be sent by the licensed vehicles to licensed disposal/recycling companies contracted by the Contractor. Project Owner will follow up waste management implementation. • Collect and properly dispose of small amount of maintenance materials such as oily rags, oil filters, used oil, etc. Never dispose spent oils on the ground and in water courses as it can contaminate soil and groundwater (including drinking water aquifer). • Need to raise community awareness on proper disposal of solar panels, specifically avoiding disposal of panels near water bodies. • End of life solar panels will be considered as “Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23” according to relevant national legislation and will be disposed of accordingly. End of life solar panels will be stored separately and send to licensed recycling facilities.			Project Owner
CP-WM-03	Waste Management	Pollution potential due to inappropriate waste storage area	Medium	• A temporary hazardous and nonhazardous waste storage area will be established by Contractor. • The door to the waste storage area will be kept locked. The access to this area will be restricted. • Containers in the waste storage area should be labeled according to waste types. • Blind shaft should be placed in case of possible leakages in the waste storage area. • Adequate number of fire extinguishers should be positioned in the waste storage area. • A signboard should be provided and hanged in a visible place in waste storage area. • Hazardous and non-hazardous wastes will be stored separately from each other. • Waste generated during construction will be removed from the project area at the end of the day. No domestic waste from workers should be stored on site. • Contracts made with waste transportation companies will be kept up to date. • Waste records will be kept regularly. • Spill kits and appropriate fire extinguishers will be kept in the waste area to prevent spills and fire emergencies. • A waste area responsible will be determined. The waste area responsible will be Contractor’s workers. The sign containing the name, surname and contact information of the waste area manager responsible will be placed at a visible point in the area.	Low	Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner
CP-WM-04	Waste Management	Excavation Soil, Construction and Demolition Wastes	Medium	• The excess excavation materials will be used as filling material on the site as much as possible. Wastes that cannot be used as filling material will be sent to the Gümüşhane Municipality excavation storage area. An agreement will be made with the Municipality regarding the submission, or an official cover letter will be provided from the Municipality indicating that permission has been given regarding the subject. • Topsoil will not be stored in the ground-mounted SPP project area but will be utilized in green areas (park area, etc.) within the OIZ. • After construction site is decommissioned, all debris and waste shall be cleared.	Low	Included in construction costs	<u>Implementation:</u> Contractor <u>Supervision/Monitoring:</u> Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
CP-SP-01	Soil Pollution	Soil pollution caused by substances such as oil, filters, etc. from maintenance and repair of construction machinery and vehicles	Medium	• Work machine and vehicle maintenance and repair operations will not be carried out in the project area. • Maintenance and repair operations will be carried out at the authorized services. • Waste and wastewater management activities will be followed as described in this ESMP.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-SP-02	Soil Pollution	Soil pollution due to leakages such as diesel oil and oil due to malfunctions of vehicles used in project construction (accidental spillages/leakages)	Medium	• Periodic maintenance and repairs of vehicles will be carried out regularly. • Response kits / spill kits to be used in emergency situations will be kept on site. • Employees will be trained regarding spills and leaks. • Records will be kept regarding emergencies / incidents. • Soil or materials affected by the spill will be taken to a temporary hazardous waste storage area as hazardous waste.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-SP-03	Soil Pollution	Soil pollution due to leakages from broken/end of life solar panels	Low	• Since solar panels are not placed on the ground, there will be no soil contamination in case of breakage. In the event of a potential leakage, the concrete floor can be cleaned with an absorbent cloth, and the resulting waste will be delivered to a disposal company as contaminated waste. • The delivery and recycling of the end-of-life solar panel from the project area are the responsibility of the relevant recycling company or the solar panel manufacturer, depending on the agreement. • To prevent any risk of accident/explosion/fire, the end-of-life solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The end-of-life solar panels will be removed from the project area on the same day.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-SO-01	Topsoil	Topsoil loss	Medium	• Topsoil will be utilized in green areas within the OIZ and will not be stored in the project area. • During excavation, topsoil will be separated from the subsoil. Depending on its depth and structure, topsoil will be stripped and temporarily stockpiled for reuse. • If there will be a need for temporary storage of topsoil, the area where the topsoil will be stored will not have a slope greater than 5%. • If topsoil is to be left exposed for a long time, it will be covered with rapidly growing plants to ensure its protection. • If the vegetative soil is stored in any area within the OIZ except the project area, channels will be created around it and covered with tarpaulin to prevent its loss by rain. • Since concrete will be laid on the area where the inverter and transformer buildings will be placed, it will be ensured that the topsoil is completely stripped. • After the topsoil is completely stripped, caution will be taken against losses while loading to the transfer vehicle. The vehicle will be covered with a tarpaulin before transfer.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-PST-01	Pesticide Use and Management	Risk related with pesticide use and management	Low	No pesticides will be used during the construction phase of the project. Therefore, no adverse impact is expected due to the use of pesticides. • If landscaping is carried out in Project areas during construction and pesticides are used during this work, the following issues should be complied with the scope of WB ESS3. • Where possible, the use of POPs in pesticide formulation should be avoided or minimized. • Safety rules for storage, handling and distribution of pesticides should be followed to minimize the potential for misuse, spillage and accidental human exposure. • The use of pesticides containing chemicals listed in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade should be avoided. • If asbestos or asbestos containing materials (ACM) are found at a construction site, they should be clearly marked as hazardous waste . • The asbestos should be appropriately contained and sealed to minimize exposure. • Prior to removal, if removal is necessary, ACM should be treated with a wetting agent to minimize asbestos dust. • If ACM is to be stored temporarily, it should be securely placed inside closed containers and clearly labeled. • Removed ACM must not be reused.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-CHS-01	Community Health and Safety	Accidents that may occur due to lack of security of the project area	Medium	• The boundary of the project area will be determined, and the project area will be surrounded by fences or warning equipment such as OHS curtains. • Warning signs will be hung. • The public will be informed at least two (2) days before construction works that may cause disturbance temporarily. • The grievance mechanism officer will be introduced to the local people and updated information about the grievance mechanism will continue to be provided.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
CP-CHS-02	Community Health and Safety	Adverse impacts that may occur in OIZ traffic due to the project	Low	• Vehicles carrying project materials will not park outside the project area. • Speed limits will be obeyed. • People who use construction equipment must have a professional qualification certificate. • Warning signs regarding the speed limit will be hung around the project area. • The working hours will be adjusted according to the peak hours of transportation. • The public, and nearby institutions and organizations, and hospitals and schools will be informed at least two days before construction works that may cause disturbance temporarily. • Contractor will take necessary health and safety measures, such as using appropriate warning signs and signboards and performing irrigation in dry seasons, under the management of the Project Owner during site preparation and construction activities. • An Emergency Response Plan (ERP) will be prepared and implemented in order to be able to take and manage measures to protect public health and safety. Project employees, local people and response teams will be informed about this plan. • The project area will be fenced to avoid physical hazards to the communities associated with the project, and construction activities will be announced to the affected local people, businesses and governmental bodies at least two (2) days in advance. • Traffic management and planning will be done.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-TPS-01	Traffic and Pedestrian Safety	Direct and indirect threats posed by construction activities against traffic and pedestrians	Low	• Traffic and warning signs will be placed around and near the project area. • The project area will be made visible. • Local people will be informed about potential hazards and risks through brochures and posters left in common areas frequently used by local people such as headman's offices, hospital, health center, mosque, coffee house and marketplace. • The activities affecting the local traffic will be planned considering the rush hours of the traffic as much as possible. • All drivers involved in the project will be informed about road safety, speed limits, and traffic rules to be followed during the project, and requirements to be observed. • To prevent unauthorized access to the construction site, the construction site will be surrounded by fence/curtain/protection tape, and uncontrolled entrances will be prevented.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-LC-01	Labor Conditions	Environmental and occupational accidents due to lack of competent and sufficient labor force. Improper Working Employment of Child labor, forced labor and unregistered employment	Medium	• At the beginning of the project, necessary training on environmental, social and OHS issues will be given to the project personnel and recorded. • Priority will be given to the local labor where possible and practical. • Workers will be provided access to the specific Workers' Grievance Mechanism and be aware about this Mechanism. • The work permits of the employees will be controlled within the scope of the Project, prohibiting child labor, forced labor, and child labor under the age of 18. • Discrimination, GBV, SEA/SH, etc. in the workplace will be eliminated through trainings and violations hereof will be properly addressed. • LMP of the TOIZP, WB ESS2 and the national legislation will be complied with in the working conditions. • Contractor will develop its own LM Plan. This plan encompasses various provisions, including the assurance that workers will be provided with written contracts detailing job descriptions, working hours, wages, rights and duties descriptions, and a Code of Conduct, among other aspects and access to Workers' GM. • Workers will be provided hygienic and adequate facilities. • Workers will be provided access to primary healthcare on site, enabling the provision of prescriptions. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-EE-01	Employment / Economy	Improper Working Conditions Child labor, forced labor and unregistered employment	Low	• Care will be taken to contributing to the local economy through the use of local materials and to procuring various goods and services from local resources. • Priority will be given to the local labor where possible and practical. • The work permits of the employees will be controlled within the scope of the project, prohibiting child labor, forced labor, and child labor under the age of 18 and properly enforced. • Discrimination in the workplace will be eliminated. • Necessary measures will be taken by contractor to make sure that workers coming from outside the city undergo a training program on dialogue and communication with local communities, and that there are no social or cultural issues between host communities and external workers. It is the Project Owner's responsibility to ensure that the contractor complies with the determined criteria. • The adequate number of appropriate firefighting equipment will be always kept available at construction sites.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
CP-CH-01	Cultural Heritage	Loss of cultural heritage	Low	• In case a cultural asset is encountered during construction phase, the work will be stopped, and the Chance Find Procedure (provided in Annex-7) will be followed, and the nearest museum directorate will be notified. • No disturbance of cultural or historic sites.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-BD-01	Biodiversity and Protected Areas	Protection	Low	• All natural habitats, wetlands and sites considered as protected areas in the immediate vicinity of the operations will not be damaged or misused. • No cutting of trees or destruction of vegetation other than on construction site. • No hunting, fishing, capture of wildlife or collection of plants. • *Pinus nigra* (Austrian pine / Black pine) and *Robinia pseudoacacia* (Black locust) trees will be relocated before construction works of the Project.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-OHS-01	Occupational Health and Safety	Work stoppage due to work accident (lack of appropriate OHS measures/unsafe work environment)	High	• The workers (both regular and contractual) on the project will be provided with training on the Health and Safety policy in place, and their role in the same and refresher courses will be provided throughout the life of the project and training records will be kept. • Work permits are implemented throughout the construction works using procedures and forms. • Employees are obligated to ensure their own health and safety, as well as that of other employees affected by their actions or work, in accordance with the occupational health and safety training they receive and the employer's instructions in this regard. • Employees are obliged to use machinery, equipment, vehicles, tools, hazardous substances, transportation devices, and other production tools in compliance with the rules, use their safety features correctly, and refrain from removing or altering them arbitrarily. • Employees are required to immediately notify the employer or employee representative when they encounter a serious and immediate health or safety hazard with machinery, equipment, vehicles, tools, facilities, or buildings at the workplace, or when they observe any deficiencies in protective measures. They are obligated to collaborate with the employer and employee representative to ensure occupational health and safety measures are upheld. • Employees are obliged to use and maintain the provided personal protective equipment correctly. • Incident/accident notification will be done. • OHS records such as incident/accident, neat misses etc. will be kept. • Tidy wiring for easy maintenance and reduces the risk of accidents. • MoIT shall obligate the OIZ concerned to report to the MoIT the details of any significant environmental or social incidents (e.g., fatalities, lost time incidents, environmental spills, etc.) within 48 hours after the occurrence of the incident or accident, and MoIT shall immediately notify the Bank upon receipt of such notification MoIT shall obligate the OIZ concerned to submit to MoIT an incident report, including root cause analysis, precautions and compensation measures taken within 30 business days of the incident.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• The contractor will ensure that no person is engaged in driving or operating construction machinery unless he/she is sufficiently competent and reliable, possess the knowledge of risks involved in the operation and is medically examined periodically. • The employee who will operate work equipment will possess a G-class driver's license, a psychotechnical report, a defensive driving certificate, and a professional competency training document (SRC (Driver) certificate).	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			Medium	• Contractor will prepare a site Emergency Preparedness and Response Procedure, which should be followed for the subjected project. • Contractor will prepare and implement OHS Plan (including OHS Risk Assessment).	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Employment of individuals under the age of 18 should be prohibited during project construction.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Adequate training will be provided to staff about raising awareness about use of Personal Protection Equipment (PPE) and emergency response measures.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			Medium	• Job responsibility and shifting chart will be prepared so that no person shall be over exhausted, which will ultimately lead to the accident or injuries.	Low	Included in construction	Implementation: Contractor

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
						costs	Supervision/Monitoring: Project Owner
			High	• Safety sign will also be marked at appropriate places.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• It shall also be ensured that good housekeeping at the construction site is maintained to avoid slips and falls.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Dropping/lowering of construction material or tool will be restricted and undertaken only under strict supervision if required. PPEs such as safety glasses with side shields, face shields, hard hats and safety shoes shall be mandatory at a construction site.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Use of personal fall arrest system, such as full body harnesses and other PPE as well as fall rescue procedures to deal with workers whose fall has been successfully arrested shall also be carried out.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• During the construction phase, the source of vibration is, the work equipment. All body vibration values of the equipment in use should be measured. If the measured value exceeds the exposure action value of 0.5m/s², preventive measures should be taken. To prevent employees from being harmed by vibration, regular maintenance of the work equipment will be conducted. Additionally, the working hours of employees will be adjusted.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• The contractor will ensure that the exhausts of the work machinery are equipped with silencers (where possible) • Construction vehicles and machinery will be well maintained and not kept idling when not in use. • Earplugs shall be provided for workers placed in high noise areas.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
			High	• Risks related to the contagious diseases or any other similar will be determined for all departments through risk assessment studies.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CO-OHS-02	Occupational Health and Safety	Work Accident Risk due to Excavation Works	High	• Work permits should be obtained before commencing work involving excavation. • The areas designated for excavation should only be accessible to authorized personnel. Loading activities should be conducted under the supervision of personnel overseeing the operations. • Excavation areas should be enclosed with barriers, marked with signs, and entry to excavated areas without implementing collapse prevention measures should be prohibited. • Excavation work should be halted during windy or rainy weather. • Never should one stand behind construction machinery, and never should one stand under suspended loads. • One should avoid working close to moving objects and should be careful of their surroundings, especially if those objects do not have lights or beepers. • Always ensure that there is a flagman to guide vehicles.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CO-OHS-03	Occupational Health and Safety	Animal Bite and Sting Risk During the Construction	High	• It is essential to identify animals that may pose a risk of bites or stings, such as snakes, scorpions, and ticks. Information regarding protective measures and medical interventions should be gathered, and construction workers should be informed on this issue. • Measures taken by local health institutions regarding poisonous animals in the area should be verified (e.g., availability of antivenom). • To protect against bites and stings, long pants, long socks, and long-sleeved clothing should be worn. Pant legs should ideally be elasticized to prevent snakes and insects from entering. • Hands should not be placed in areas where snakes, scorpions, spiders, etc., might be hiding. • If work shoes and clothing need to be removed and then worn again in the project area, they should be checked	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
				for snakes, scorpions, or spiders before putting them on. • Behavior that may startle, frighten or threaten an animal must be avoided. Personnel who are bitten or stung by an animal should be immediately directed to health institutions.			
CP-SE-01	Stakeholder Engagement	Insufficient stakeholder engagement activities and public consultation	Medium	Public awareness and sufficient public engagement should provide the following informative actions: • Information about current progress of the Project • Disclosure and consultation regarding the Project and its E&S risks and impacts. • Implementation of project-specific Grievance Mechanism • Use of various communication tools and consultation methods to keep open the communication channels • Providing information about MoIT and WB's grievance redress services • Grievance mechanisms and tools other than project-specific GM implementations. • Sharing in-company employment and internship opportunities.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner
CP-GM-01	Grievance Mechanism	Insufficient and/or ineffective grievance mechanism for the internal and external stakeholders	Medium	• Disclosure including for stakeholder in line with project specific GM • Information about current progress of the ProjectImpact of changes in the Project on employees • Information on occupational health and safety • Providing information about MoIT and WB's grievance redress services • Grievance mechanisms and tools other than project-specific GM implementations. • Establishing employee codes of conduct and raising awareness among employees on this issue.	Low	Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner

8.3 Mitigation Plan for the Operation Phase

Table 29. Mitigations for the Operation Phase

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
OP-WM-01	Waste Management	Waste generation due to maintenance and repair of SPP units	Medium	• Waste records will be kept regularly. • OIZ should develop its waste management system and establish a hazardous temporary waste storage area. OIZ will obtain the necessary permits for this area. • The wastes will be delivered to licensed companies by OIZ. • Hazardous and non-hazardous wastes will be stored separately from each other in line with the national and international standards (WB ESSs). • Temporarily stored waste will be labeled with the phrase “hazardous waste” as well as the waste code, the amount of waste stored and the date of storage. • Hazardous waste will be delivered to licensed disposal / recycling facilities by using licensed transportation vehicles. Waste transportation will be carried out with the help of online mobile waste tracking system (MoTAT). Regarding the disposal of hazardous waste, the provisions of the 'Waste Management Regulation' will be complied with. • If different categories of oils are produced from the works at the construction site, these oils will be stored separately. • Containers where waste oils are stored will be kept closed and protected from rainwater. • The maintenance of the construction machinery to be used during the construction phase will be carried out at authorized services. However, if waste accumulators or end-of-life tires are generated in the project area, they will be sent to the OIZ’s temporary waste storage area and delivered to licensed companies. • Wastes will be sent by the licensed vehicles to licensed disposal/recycling companies contracted by the Contractor. Project Owner will follow up waste management implementation. • Collect and properly dispose of small amount of maintenance materials such as oily rags, oil filters, used oil, etc. Never dispose spent oils on the ground and in water courses as it can contaminate soil and groundwater (including drinking water aquifer). • Need to raise community awareness on proper disposal of solar panels, specifically avoiding disposal of panels near water bodies. • End of life solar panels will be considered as “Discarded electrical and electronic equipment containing hazardous parts other than 20 01 21 and 20 01 23” according to relevant national legislation and will be disposed of accordingly. End of life solar panels will be stored separately and send to licensed recycling facilities.	Low	No additional cost	<u>Implementation:</u> Project Owner
OP-SP-03	Soil Pollution	Soil pollution due to leakages from broken/end of life solar panels	Low	• Since solar panels are not placed on the ground, there will be no soil contamination in case of breakage. In the event of a potential leakage, the concrete floor can be cleaned with an absorbent cloth, and the resulting waste will be delivered to a disposal company as contaminated waste. • The delivery and recycling of the end-of-life solar panel from the project area are the responsibility of the relevant recycling company or the solar panel manufacturer, depending on the agreement. • To prevent any risk of accident/explosion/fire, the end-of-life solar panels will be temporarily stored on the concrete floor away from the existing system, and the relevant company will be promptly informed. The end-of-life solar panels will be removed from the Project area on the same day.	Low	Included in construction costs	<u>Implementation:</u> Project Owner
OP-PST-01	Pesticide Use and Management	In case landscaping is needed	Low	No pesticides will be used during the operation phases of the project. Therefore, no adverse impact is expected due to the use of pesticides. However, if landscaping is carried out in Project area during operation and pesticides are used during this work, the following issues should be complied with the scope of WB ESS3. • Where possible, the use of POPs in pesticide formulation should be avoided or minimized. • Safety rules for storage, handling and distribution of pesticides should be followed to minimize the potential for misuse, spillage and accidental human exposure. • The use of pesticides containing chemicals listed in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade should be avoided.	Low	No additional cost	<u>Implementation:</u> Project Owner
OP-CHS-01	Community Health and Safety	Unauthorized access to the solar panels	Low	• Periodic safety checks will be carried out by the Project Owner. • Grounding must be done. • Safety and warning signs must be placed. • To continue GM implementation • Need to raise community awareness on electrical hazards and health and safety concerns, as well as proper maintenance of solar panels.	Low	No additional cost	<u>Implementation:</u> Project Owner
OP-LC-01	Labor and	Environmental and	Medium	• Workers will be provided access to the specific Workers’ Grievance Mechanism and be aware about this	Low	No additional cost	<u>Implementation:</u>

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
	Working Conditions	occupational accidents due to lack of competent and sufficient labor force. Improper Working Conditions Child labor, forced labor and unregistered employment		Mechanism. • The work permits of the employees will be controlled within the scope of the Project, prohibiting child labor, forced labor, and child labor under the age of 18 and enforcement will take place. • Discrimination, GBV, SEA/SH, etc. in the workplace will be eliminated through trainings and violations will be addressed. • LMP of the TOIZP, WB ESS2 and the national legislation will be complied with in the working conditions. • Contractor will develop its own LM Plan. This plan encompasses various provisions, including the assurance that workers will be provided with written contracts detailing job descriptions, working hours, wages, rights and duties descriptions, and a Code of Conduct, among other aspects. • Discrimination based on language, race, gender, political thought, philosophical belief and religion will be avoided in business relations.			Maintenance Contractor <u>Monitoring:</u> Project Owner
OP-OHS-01	Emergency Preparedness and Response	Fire caused by electric arc	Low	• Periodic maintenance plan of the solar panels and cables will be prepared and implemented. • Appropriate firefighting equipment will be available in the project area. • Emergency Preparedness and Response Plan will be prepared and implemented. • Emergency teams will be formed and informed. • Employees will be trained on emergency situations and fire extinguishing drills will be carried out.	Low	No additional cost	<u>Implementation:</u> Project Owner
OP-OHS-02	Occupational Health and Safety- Work stoppage	Access from outside and accidents that may occur due to lack of security of the project area	High	• Warning signs will be hung. • Access to the project area will be restricted during the operation phase. • Relevant OHS risks (to be determined by risk assessment) will be included in the OHS Plan of OIZ	Low	No additional cost	<u>Implementation:</u> Project Owner
OP-OHS-03	Occupational Health and Safety Hazard	Working at height and working with electricity (during maintenance and repair)	High	• Use of personal fall arrest system, such as full body harnesses and other PPE as well as fall rescue procedures to deal with workers whose fall has been successfully arrested shall also be carried out during the maintenance and repair works. • Only adequately trained/ certified personnel will be allowed to work at height and/or electricity.	Low	No additional cost	<u>Implementation:</u> Maintenance Contractor <u>Monitoring:</u> Project Owner
		Tripping, slipping, and falling on uneven ground (during maintenance and repair)	Medium	• Maintenance of good housekeeping will be ensured to prevent slips and falls.	Low	No additional cost	<u>Implementation:</u> Maintenance Contractor <u>Monitoring:</u> Project Owner
		Working with chemicals	High	• Personnel working with chemicals must use equipment and PPE suitable for the working conditions and the chemicals. • Personnel will work in accordance with the hazard cards prepared by the H&S Unit.	Low	No additional cost	<u>Implementation:</u> Maintenance Contractor <u>Monitoring:</u> Project Owner
OP-OHS-04	Occupational Health and Safety	Animal Bite and Sting Risk	High	• It is essential to identify animals that may pose a risk of bites or stings, such as snakes, scorpions, and ticks. Information regarding protective measures and medical interventions should be gathered, and construction workers should be informed on this issue. • Measures taken by local health institutions regarding poisonous animals in the area should be verified (e.g., availability of antivenom). • To protect against bites and stings, long pants, long socks, and long-sleeved clothing should be worn. Pant legs should ideally be elasticized to prevent snakes and insects from entering. • Hands should not be placed in areas where snakes, scorpions, spiders, etc., might be hiding. • If work shoes and clothing need to be removed and then worn again in the project area, they should be checked for snakes, scorpions, or spiders before putting them on. • Behavior that may startle, frighten or threaten an animal must be avoided. Personnel who are bitten or stung by an animal should be immediately directed to health institutions.	Low	No additional cost	<u>Implementation:</u> Maintenance Contractor <u>Monitoring:</u> Project Owner
OP-SE-01	Stakeholder Engagement	Insufficient stakeholder engagement activities and public consultation	Low	• Continuation of the Project specific GM • Appointment of Community Liaison Officers (CLOs) • Institution of Public Relations (PR) office on-site • Continue to use various communication tools and consultation methods to keep open the communication channels • Considering language-based handicaps for any kind communication techniquesProviding a living document	Negligible	Included in the Project Owner's budget	<u>Implementation:</u> Project Owner

No.	Issue	Potential Impact	Impact Significance Before Mitigation (Low, Medium, High)	Mitigation Measure	Impact Significance After Mitigation (Low, Medium, High)	Cost of Mitigation *(if substantial)*	Responsible Party/Parties
				form used in disclosure process			
OP-SE-01	Grievance Mechanism	Insufficient and/or ineffective grievance mechanism for the internal and external stakeholders	Low	• Continuation of the Project specific GM • Appointment of CLOs • Assignment of grievances to relevant departments	Negligible	Included in the Project Owner's budget	Implementation: Project Owner

9. ENVIRONMENTAL AND SOCIAL MONITORING PLAN

The monitoring, review and audit program detailed in between Table 30 and Table 32 will be implemented during pre-construction, construction and operation to monitor the implementation of the environmental and social commitments of the ESMP requirements. The Project Owner will be responsible for ensuring that the Contractor and its contractor comply with applicable national and international regulations requirements.

9.1 Monitoring Plan for the Pre-Construction Phase

Table 30. Monitoring Plan for the Pre-Construction Phase

No.	**Issue**	**Parameters to be monitored** *(What parameter is to be monitored?)*	**Target/Threshold Value**	**Monitoring location** *(Where the parameter is to be monitored?)*	**Monitoring Method** *(How is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring** *(When is the parameter to be monitored-frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**	**Supervision observation and comments** *to be filled out during supervision with reference to adequate measuring reports*
MON-PR-GN-01	Disclosure	• Permits/approvals/certifications/official letters	• All permits/approvals/certification/official letters are available and valid • Environmental permit for WWTP must be obtained	• Project Owner's Administrative Building and Contractor's office	• Review and control of permits / approvals / certifications / official letters.	• Before construction starts	• Included in construction costs and supervision costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-PR-BIO-01	Plantation Trees	• *Pinus nigra* (Austrian pine / Black pine) and *Robinia* pseudoacacia (Black locust) trees	• Relocation of *Pinus nigra* (Austrian pine / Black pine) and *Robinia* pseudoacacia (Black locust) trees	• Project area	• On-site inspection	• Before construction starts	• 3.000 $	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-PR-TR-01	Permits and Pre-design	• Trainings on grievance mechanism, gender-based violence, sexual exploitation and abuse, sexual harassment • Trainings on ESMP	• All the staff should participate in training sessions which include OHS, Code of Conduct (CoC), grievance mechanism (GM), gender-based violence (GBV), sexual exploitation and abuse, sexual harassment (SEA/SH) prior to construction activities. • %100 Completion of ESMP training by the Environmental and Social Consultant.	• Project Owner's Administrative Building	• Review of training documents and records	• Before construction starts	• Supervision cost	Implementation: Contractor Project Owner Supervision/Monitoring: Project Owner ESMP Training: Environmental and Social Consultant	
MON-PR-OHS-01	Occupational Health and Safety	• Documents to be prepared before the commencement of construction works (OHS Plan, OHS Risk Assessment, LM Plan, etc.) • Initial E&S and OHS trainings	• %100 of documents prepared and approved (The plans have sufficient content and include COVID-19 and other contagious diseases or other outbreak precautions) • All workers trained	• Project Owner's Administrative Building • Contractor's office	• Document review • Review of training documents and records	• Before construction starts	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-PR-CHS-01	Community Health and Safety	• Fencing • Warnings/signs	• Project area enclosed • Warnings/signs placed at appropriate locations within the project area	• Project Area	• On-site inspection	• Before construction starts	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-PR-SE-01	Stakeholder Engagement	• Establishment of GM • Smooth Management of Disclosure Process	• Grievances resolved in time and in mutually satisfactory manner	• Project Area	• On-site inspection • Public consultation meetings	• Before construction starts	• Public consultation meeting cost • Supervision cost	Implementation: Contractor Supervision/Monitoring: Project Owner	

9.2 Monitoring Plan for the Construction Phase

Table 31. Monitoring Plan for the Construction Phase

No.	Issue	**Parameters to be monitored** *(What parameter is to be monitored?)*	**Target/Threshold Value**	**Monitoring location** *(Where the parameter is to be monitored?)*	**Monitoring Method** *(How is the parameter to be monitored/ type of monitoring equipment?)*	**Timing/Frequency of Monitoring** *(When is the parameter to be monitored- frequency of measurement or continuous?)*	**Cost of Monitoring** *(What is the cost of equipment or contractor charges to perform monitoring?)*	**Responsible Party/Parties**	**Supervision observation and comments** *to be filled out during supervision with reference to adequate measuring reports*
MON-CP-AQM-01	Air Quality (dust and air emissions)	• Air quality grievance records • Dust and exhaust gas emissions • Air quality management implementations (such as dust suppression, use of tarpaulins during transportation of excavated materials, etc.) • Air quality measurements (PM10 and PM2.5 measurements in case of grievance)	• Zero non-compliance on air quality management • Zero complaint/grievance on air quality	• Project area • Sensitive receptor(s) (in case of grievance)	• On-site inspections • PM10 and PM2.5 measurements to be performed by an authorized environmental laboratory at the sensitive receptor(s) in case of grievance	• In case of grievance (for measurements)	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Prpject Owner	
MON-CP-NOI-01	Noise	• Noise grievance records • Noise management implementations (such as announcement of working schedule, periodic inspection and maintenance records of the construction machinery and equipment, etc.) • Noise measurements (in case of grievance)	• Zero non-compliances on noise management • Zero noise grievances	• Project area Sensitive receptor(s) (in case of grievance)	• On-site inspections • Document review/checks (such as announcement records, machinery/ equipment inspection and maintenance records, etc.) • Noise measurements to be performed by an authorized environmental laboratory at the sensitive receptor(s) in case of grievance	• In case of grievance (for measurements) • Weekly(on site inspections and document review)	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-WWM-01	Wastewater Management	• Presence of impermeable septic tank/mobile toilets • Vacuum records of the septic tank/mobile toilets • Wastewater amount sent to OIZ's WWTP or Gümüşhane Municipality WWTP. • Availability of the protocols/agreement for vacuuming and treatment made with Gümüşhane Municipality	All domestic wastewater is collected in an impermeable septic tank, or reservoir of the mobile toilets and regularly sent to OIZ's WWTP or licensed Gümüşhane Municipality WWTP to be treated via licensed vehicles. Regular record keeping All necessary agreement/protocol will be done.	• Project area	• On-site inspections • Review of the documentation (vacuum records, wastewater amount generated, protocols/ agreement, etc.)	• Weekly • Before the mobil toilet reservoir or septic tank is full	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-WM-01	Waste Management	• Waste records (amount of waste generated, waste types, disposal situations, etc.) • On-site waste management practices such as proper collection and temporary storage of wastes, etc.	• Minimization of total waste generated (less than calculated in impact section) • Minimize the ratio of hazardous waste generated to total waste (by contamination and by generation) • Increase ratio of recovered/reused/recycled to landfilled	• Project area (including waste storage area(s))	• Review and control of waste records • On-site inspection regarding waste management practices such as proper collection and temporary storage of wastes, etc.	• Weekly	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-	Domestic Waste	• Domestic waste amount	• Minimization of domestic waste	• Project area	• Review and control of	• Daily	• Included in	Implementation:	

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored-frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties	Supervision observation and comments *to be filled out during supervision with reference to adequate measuring reports*
WM-03	Management	• Recovery /reuse /recycle ratio	generated • Increase in the ratio of recovered/reused/recycled to landfilled (less than calculated in impact section)		domestic waste records • On-site inspection		construction costs	Contractor Supervision/Monitoring: Project Owner	
MON-CP-WM-04	Hazardous Waste Management	• Hazardous waste amount • Recovery /reuse /recycle ratio • Hazardous waste management practices including relevant documentation (such as Hazardous Waste Liability Insurance, availability and condition of temporary waste storage area, spill kits, fire precautions, etc.)	• Minimization of hazardous waste generated • Proper handling of hazardous wastes	• Project area (including waste storage area(s))	• Review and control of hazardous waste records and documents • On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-WM-05	Nonhazardous Waste Management	• Nonhazardous waste amount • Recovery /reuse /recycle ratio	• Minimization of Nonhazardous waste generated • Increase in the ratio of recovered/reused/recycled to landfilled	• Project area	• Review and control of nonhazardous waste records • On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-WM-06	Excavation Waste Management	• Amount of refilled, stored, and disposed excavation waste/materials	• Increase in the ratio of excavation waste generated to reused (reuse of all calculated amount in impact section)	• Project area and excavation waste/material storage area(s)	• Review and control of excavation waste/material records • On-site inspection	• Once in a week during excavation works	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-CH-01	Cultural Heritage	• Chance find and implementation of chance find procedure	• No cultural heritage asset is damaged	• Project area	• On-site inspection • Review and control of chance find records	• In case of chance find	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-BD-01	Biodiversity and Protected Areas	• Alteration in the habitat	• Zero damage to natural habitats, wetlands and sites considered as protected or sensitive areas • Zero hunting, capture of wildlife, collection of plants	• Project area	• On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-SOI-01	Topsoil	• Topsoil amount • Reuse of topsoil • Topsoil striping	• Topsoil appropriately stripped (separated from the subsoil) and utilized in green areas within the OIZ • Topsoil appropriately stored when needed • No topsoil loss	• Project area • Utilization area (green areas)	• On-site inspection	• During topsoil stripping	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-PST-01	Pesticide Use and Management	• Pesticide use records (amounts and types)	• Minimization of pesticide use	• Project area	• Pesticide use records	• During landscaping activities	• Brings no additional cost	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-TPS-01	Traffic and Pedestrian Safety	• Traffic related grievance records • Traffic warning signs • Brochures/posters delivered • Timing plan according to rush hours	• Zero number of drivers found to be exceeding speed limits or driving unsafely • Zero road traffic accidents • Zero accidental injuries and deaths • Zero traffic-related grievances	• Project area	• On-site inspection • Documentation checks	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties	Supervision observation and comments *to be filled out during supervision with reference to adequate measuring reports*
		• Training records of the workers on the issue							
MON-CP-CHS-01	Community Health & Safety	• Number of Grievances • Number of Incidents • Number of Accidents	• Effective and satisfactory resolution of all received complaints Zero incidents • Receiving and recording complaints • Reducing the number of open complaints	• Project area • Residential areas around project area	• Records of comments/ suggestions/complaints • Site Audits • Training records • Incident/Accident Records (if any) • Number of communicable and non-communicable diseases and injuries • Number of community health safety & security complaints from local communities as recorded in the grievance management system • Number of reported community health & safety incidents	• Monthly	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-LC-01	Labor Conditions	• Workers' Grievances • Training records • Recruitment documentations • Number of employees	• All grievances addressed and closed out within the target timeframe. • All employees will be trained in OHS, GM, GBV, SEA/SH trainings, ESMP training and other E&S issues by the consultant (ÇINAR) will be provided. • All recruitment documentation complied with national and international requirements.	• Project area	• Internal and external audits • Grievance records • (number and nature of grievances) • Accident/incident records • Training records • Sample contracts • Human Resource Policy • Number of the local employees • Legal work permit	• Monthly	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-OHS-01	Occupational Health and Safety	• Use of PPE	• Specific PPE matrices will be created for work areas throughout the facility. • Personnel will be provided with equipment that is suitable for the working conditions and meets the specifications and standards outlined in the PPE matrices.	• Project area	• On-site inspection • Review and control of PPE records	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
		• Training	• Mandatory basic OHS training, emergency intervention training, and training on social rights will be provided to all employees and subcontracted personnel. • Orientation training will be mandatory for all personnel, subcontractor personnel, and anyone entering the facility. Competency tests will be conducted before and after the training. • All employees will receive accident investigation and root cause	• Project area	• On-site inspection • Review and control of training documents and records	• Continuous	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored-frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties	Supervision observation and comments *to be filled out during supervision with reference to adequate measuring reports*
			training following workplace accidents. • All training will be provided in Turkish and/or in a language suitable for the facility's employees.						
		• Machinery and Equipment	• A list of all work machines throughout the facility will be compiled, and their operators will be designated. Work machines will only be operated by their designated operators. Areas without personnel access will be determined to ensure that work machines do not have unauthorized individuals in their vicinity. Periodic inspections of work machines, as required by national regulations, will be monitored, and conducted by the H&S Unit. • (Regulation on Health and Safety Conditions in the Use of Work Equipment, numbered 28628 and dated 25.04.2013)	• Project area	• On-site inspection • Review and control of machinery and equipment documents and records	• Monthly	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
		• Occupational accidents and near-miss incident records	• Records of occupational accidents and near-miss incidents will be kept systematically, and after each incident, a root cause analysis will be conducted to take measures to prevent the recurrence of the incident. • Records in Workers' GM related to OHS	• Project area	• On-site inspection • Review and control of accident and near-miss incident records • Review and control of workers' GM records related to OHS	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
		• Safety Signs and Warning Signs	• Warning signs will be designed for the entire facility in accordance with national regulations and work areas, and all facility warning signs will be updated.	• Project area	• On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
		• Work Permits	• Work permits will be obtained before commencing work involving working at heights, excavation, working electricity and hot work.	• Project area	• On-site inspection • Review and control of work permits	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
		• First Aid	• A sufficient number of personnel who have received Basic First Aid Training, appropriate for the hazard class, will be provided and distributed evenly in the operational areas.(As per the First Aid Regulation (Official Gazette Date: 29 July 2015; Number: 29429) ARTICLE 19 – (1) Within the scope of occupational health and safety; a) In slightly hazardous workplaces, there must be 1 first aider for every 20 employees, b) In hazardous	• Project area	• On-site inspection • Review and control of basic first aid training records/certificates	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored-frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties	Supervision observation and comments *to be filled out during supervision with reference to adequate measuring reports*
			workplaces, there must be 1 first aider for every 15 employees, c) In highly hazardous workplaces, there must be 1 first aider for every 10 employees). • First aid materials and kits will be provided throughout the project. • First aid materials will be regularly inspected, and any deficiencies will be addressed by the health unit on a monthly basis.						
		• Electrical works	• Only qualified and trained personnel will work with electricity.	• Project area	• On-site inspection • Review and control of training records/related certificates	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-OHS-02	• Occupational Health and Safety	• Excavation works	• The areas designated for excavation will only be accessible to authorized personnel. • Excavation areas will be enclosed with barriers, marked with signs, and entry to excavated areas without implementing collapse prevention measures should be prohibited. • Excavation work will be halted during windy or rainy weather. • One will avoid working close to moving objects and should be careful of their surroundings, especially if those objects do not have lights or beepers. • Always ensure that there is a flagman to guide vehicles.	• Project area	• On-site inspection	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-OHS-03	• Occupational Health and Safety	• Animals that may pose a risk of bites or stings	• Personnel will be informed. • Ensure that personnel are appropriately equipped for potential hazards.	• Project area	• On-site inspection • Review and control of training records	• Daily	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-SE-01	• Stakeholder Engagement	• ESMP implementation / public consultations records • Stakeholder engagement records	• All provisions given in the ESMP will be implemented and recorded. • At least one public consultation meeting will be held.	• Project area and Project management office	• Minutes of public consultation meeting • Stakeholder engagement records	• Continuous	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	
MON-CP-GM-01	• Grievance Mechanism	• Grievances recorded (Grievance database)	• Number and nature of the grievances will be recorded, addressed, analyzed and closed with the satisfaction of the holder • All grievances will be closed-out within the target timeframe.	• Project area and Project management office	• Grievance records (numbers of open and closed grievances, statistics regarding the nature of the grievances)	• Continuous	• Included in construction costs	Implementation: Contractor Supervision/Monitoring: Project Owner	

9.3 Monitoring Plan for the Operation Phase

Table 32. Monitoring Plan for the Operation Phase

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
MON-OP-WM-01	Waste Management	• Waste records (amounts, types, disposal/recycling information) • On-site waste management practices such as proper collection and temporary storage of wastes during maintenance activities (including end of life solar panels), etc. • Hazardous waste storage area must be established and permits will be obtained.	• Minimization of total waste generated • Minimize the hazardous waste generated • Permits for hazardous waste storage area	• Project area	• Review and control of waste records • On-site inspection regarding waste management practices such as proper collection and temporary storage of wastes (including end of life solar panels), etc.	• During maintenance and repair activities	• No additional cost	Supervision/Monitoring: Project Owner
MON-CP-WWM	Water Management	• Amount of water used for solar panel cleaning (every six months)	• Minimization of water use for panel cleaning	• Project area	• Review and control of water use records • On-site inspection while solar panels are cleaning	• Every six (6) months for panel cleaning	• No additional cost	Supervision/Monitoring: Project Owner
MON-OP-CHS-01	Community Health & Safety	• Grievances • Incidents • Accidents • Warning signs presence	• No significant increase in injury rates • Decreasing number/ continuous improvement in number of complaints • Zero incidents per year • Zero grievances per year	• Project area • Residential areas around project area	• Records of comments/ suggestions/complaints • Site Audits • Training records	• Monthly	• No additional cost	Supervision/Monitoring: Project Owner
MON-OP-OHS-01	Occupational Health and Safety	• Electrical works	• Only qualified and trained personnel will work with electricity.	• Operation area	• On-site inspection • Review and control of training records/related certificates	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner
		• First Aid	• A sufficient number of personnel who have received Basic First Aid Training, appropriate for the hazard class, will be provided and distributed evenly in the operational areas. • First aid materials and kits will be provided throughout the project. • First aid materials will be regularly inspected, and any deficiencies will be addressed by the health unit on a monthly basis.	• Operation area	• On-site inspection • Review and control of basic first aid training records/certificates	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner
		• Use of PPE	• Specific PPE matrices will be created for work areas throughout the facility. • Personnel will be provided with equipment that is suitable for the working conditions and meets	• Operation area	• On-site inspection • Review and control of PPE records	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
			the specifications and standards outlined in the PPE matrices.					
		• Training	• Mandatory basic OHS training, emergency intervention training, and training on social rights will be provided to all employees and subcontracted personnel. • Orientation training will be mandatory for all personnel, subcontractor personnel, and anyone entering the facility. Competency tests will be conducted before and after the training. • All employees will receive accident investigation and root cause training following workplace accidents. • Minimum one annual refresher training for GM, SEA/SH and GBV should be added, and all staff should participate in integrated training sessions. • All training will be provided in Turkish and/or in a language suitable for the facility's employees.	• Operation area	• On-site inspection • Review and control of training documents and records	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner
		• Occupational accidents and near-miss incident records	• Records of occupational accidents and near-miss incidents will be kept systematically, and after each incident, a root cause analysis will be conducted to take measures to prevent the recurrence of the incident.	• Operation area	• On-site inspection • Review and control of accident and near-miss incident records	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner
		• Safety Signs and Warning Signs	• Warning signs will be designed for the entire facility in accordance with national regulations and work areas, and all facility warning signs will be updated.	• Operation area	• On-site inspection	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner
		• Work Permit	• Work permits will be obtained before commencing work	• Operation area	• On-site inspection • Review and control of work permits	• Continuous	• No additional costs	Supervision/Monitoring: Project Owner

No.	Issue	Parameters to be monitored *(What parameter is to be monitored?)*	Target/Threshold Value	Monitoring location *(Where the parameter is to be monitored?)*	Monitoring Method *(How is the parameter to be monitored/ type of monitoring equipment?)*	Timing/Frequency of Monitoring *(When is the parameter to be monitored- frequency of measurement or continuous?)*	Cost of Monitoring *(What is the cost of equipment or contractor charges to perform monitoring?)*	Responsible Party/Parties
			involving working at heights.					
		• Emergency Preparedness and Response (risk of fire caused by electric arc) • Existence of a Periodic maintenance plan • Firefighting equipment availability • Emergency Preparedness and Response Plan • Emergency team presence • Drill records	• Periodical maintenance and repairs of solar panels and cables will be performed • Emergency Preparedness and Response Plan will be available • Emergency teams will be formed and trained. • Firefighting equipment will be available in the carport SPP area.	• Administrative building • Operation area	• On-site inspection • Document control • Review and control of training and drill records • Review and control of periodical maintenance plan	• Continuous	• Included in Project Owner's budget	Supervision/Monitoring: Project Owner
MON-CP-OHS-02	Occupational Health and Safety	• Animals that may pose a risk of bites or stings	• Personnel will be informed. • Ensure that personnel are appropriately equipped for potential hazards.	• Project area	• On-site inspection • Review and control of training records	• Daily	• Included in Project Owner's budget	Supervision/Monitoring: Project Owner
MON-OP-SE-01	Stakeholder Engagement	• ESMP implementation / public/stakeholder consultation records	• All provisions given in the ESMP will be implemented and recorded.	• Project area and project management office	• Minutes of public/stakeholder consultation meeting • Stakeholder engagement records	• Continuous	• Included in Project Owner's budget	Supervision/Monitoring: Project Owner
MON-OP-GM-01	Grievance Mechanism	• Grievances recorded (Grievance database)	• Number and nature of the grievances will be recorded, addressed, analyzed and closed with the satisfaction of the holder • All grievances will be closed-out within the target timeframe.	• Project area and project management office	• Grievance records (numbers of open and closed grievances, statistics regarding the nature of the grievances)	• Continuous	• Included in Project Owner's budget	Supervision/Monitoring: Project Owner

10.INSTITUTIONAL ARRANGEMENT AND TRAINING

10.1 Roles and Responsibilities

The Industrial Zones Directorate in MoIT will be the responsible Project Implementation Unit (PIU), which will coordinate overall project activities on a daily basis and involve other MoIT units and departments as needed. The PIU shall include environmental and social specialists (one environmental, one social, one occupational health and safety and one stakeholder engagement specialists) with sufficient qualifications and experience to manage implementation of the ESMP and respective requirements.

Gümüşhane OIZ will have a project management unit that will include experts at least one environmental expert, one social expert and one OHS expert. Within the OIZ management, there are officials dealing with the issues specified under the Project. A PMU has not been officially established, but a team of existing OIZ officials with relevant expertise will be brought together to fulfill the tasks included in this ESMP. In case the financial and institutional capacity of the OIZ is not sufficient to employ experts/consultant company, MoIT will hire external consultancy or independent experts on behalf of OIZ management.

The organizational chart of Project Management Unit (PMU) of Gümüşhane OIZ is presented in Figure 23 and the detailed responsibilities of the experts in PMU are provided in Table 33. On the other hand, the roles and responsibilities of all project parties are provided in Table 34.

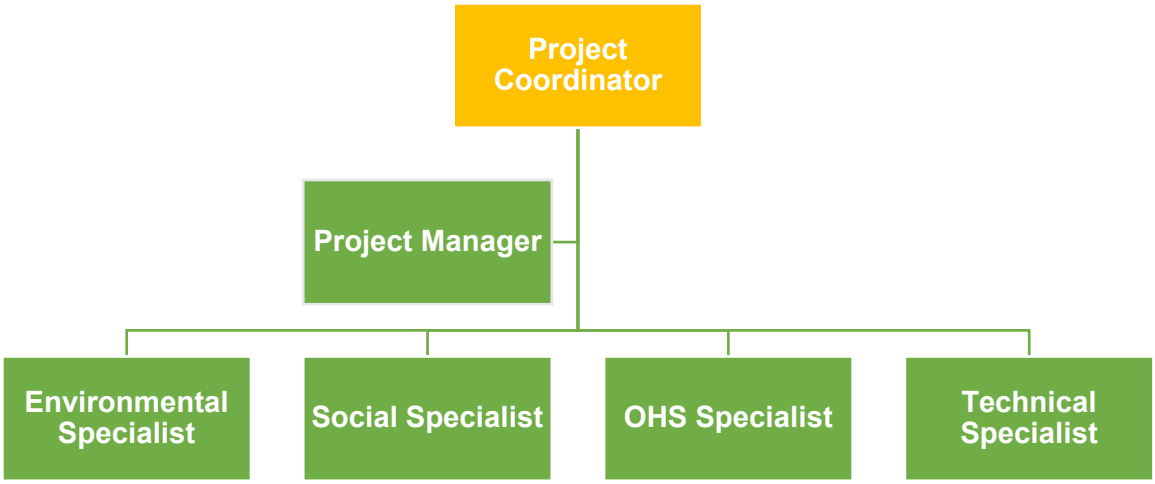

Figure 23. Organizational Chart of Project Management Unit (PMU)

Table 33. General Organization Structure of PMU for Implementation of ESMP

Roles	Responsibilities
Project Coordinator	• Overall responsibility for the ESMP implementation
Project Manager	• Ensure that ESMP provisions are implemented to mitigate environmental (including OHS) and social impacts, and contractor's Labour Management Plan is in accordance with the LMP, • Ensure that all workers participate in training sessions on ESMP. Maintain a record of training and conduct of awareness sessions for staff to ensure compliance with environmental and safety commitments stated in ESMP, • Prepare monthly environmental and social monitoring reports for submission to MoIT PIU, • Ensure monitoring of the implementation of the ESMP and LMP
Environmental Specialist	• Ensure that the environmental management systems of the project comply

Roles	Responsibilities
	with the ESMP, • Monitor the environmental impacts and risks of the construction activities on site. • Ensure monitoring of the LMP implementation.
Social Specialist	• Establish an easily accessible and workers public grievance mechanism, • Manage and ensure effective operationalization of the GM, • Record grievances, • Disclosure to complainant, • Monitor the social impacts and risks of the construction activities on site, • Ensure that ESMP provisions are implemented to mitigate environmental and social impacts, • Undertake monitoring of the implementation of the ESMP. • Ensure monitoring of the LMP implementation.
OHS Specialist	• Ensure that implementation and supervision of Occupational Health and Safety Management Plan, • Preparedness and response to emergency situation according to Emergency Response Plan, • Notify MoIT PIU immediately if any contingencies such as labor issues, accidents and incidents. The incident report including root cause analysis, precautions and compensation measures taken, will be shared with MoIT PIU in 30 business days, • Ensure that ESMP provisions on OHS issues are implemented to avoid and mitigate OHS risks and impacts, • Undertake monitoring of the implementation of the ESMP on OHS issues. • Ensure monitoring of the LMP implementation.
Technical Specialist	• Responsible for the project design, • Coordinating the actions and evaluations in case of a change due to engineering/design changes.

Table 34. Responsibilities of Project Parties

Responsible Entity	Responsibilities
MoIT PIU	• Be the main responsible party for monitoring, supervising and ensuring the implementation of ESMF, ESMP, LMP and grievance mechanism, • Carrying out screening of the sub-projects regarding E&S risk categorization according to the WB's requirements, • Providing guidance to OIZs and E&S consultant on preparation of E&S assessment documents in accordance with the World Bank's requirements (standards, guidelines and procedures), • Providing OIZ staff and E&S consultant with guidance on the World Bank's ESSs and safeguard requirements (documentation and procedures), • Guiding OIZ and the consultant on stakeholder consultation and announcement requirements within the scope of this ESMP, • Reviewing ESA documentation, provide written comments to OIZ and E&S consultant, ultimately provide formal approval of E&S assessment documentation and procedures in accordance with the World Bank's ESSs and safeguard requirements, • Following of monitoring activities such as the implementation of this ESMP, other environmental and social mitigation measures, grievance process and Main Project's LMP, • Be open and responsive to concerns raised by affected groups and local environmental authorities regarding environmental aspects of sub-project implementation. Meet with these groups during site visits, as necessary, • Monitoring and auditing OIZs' ESMP practices and giving feedback on its performance, recommendations, and further steps to be taken within the overall project audit, • Monitoring and auditing OIZs' environmental and social issues at the sites (including OHS issues) through data collected from the site visits, • Providing training on the ESMP and ESF requirements to the OIZs, • In case necessesary, providing coordination and communication regarding the field visits. • Providing OHS, Code of Conduct, GM, GBV, SEA/SH trainings to OIZ PMU, and Contractor's Environmental and Social Specialists.
OIZ Project Management Unit (PMU)	• Assigning/hiring full time one environmental expert, one OHS expert and one social expert with sufficient qualifications and skills • Identification and management of risks and impacts related to environmental, social and

Responsible Entity	Responsibilities
	OHS issues during construction activities on site • Implementation of the ESMP and achieving of all commitments under the plans. • Checking both the technical and administrative progress of contract packages. • Providing support to implementation of the mitigation measures and commitments given in the ESMP on site. • The E&S Team will also be responsible for taking actions required to eliminate/minimize environmental and social impacts and risks in line with this ESMP and for putting monitoring plans into practice, • Sharing the ESMP with the Contractor • Guiding the Contractor in preparing and approving the sub-management plans and Contractor's LM Plan, • Coordinating the actions and evaluations such as performing a new stakeholder consultation meeting, information disclosure, notifications to the public etc. in case of a change due to engineering/design changes, route/location changes, and legislative changes related to environmental or social issues, authorization provision changes, new environmental or social data, construction/operation strategy changes. • Updating the ESMP when necessary and sharing additional commitments with the Contractor, • E&S Monitoring Reports to be prepared monthly by the Contractor and submitted to OIZ PMU and then to be submitted to MoIT by OIZ PMU on a monthly basis after reviewing. • Monitoring and evaluating the performance of the Contractor activities in line with ESMP requirements, • Ensuring compliance with project standards, taking urgent action in case of non-compliance within the knowledge and approval of MoIT PIU, • Any non-conformities found during the inspections will be managed by a process adapted to the severity of the case, • Suspending work in any situation that threatens environment and community and occupational health and safety and informing MoIT PIU, • Analyzing and following-up the environmental (including OHS) or social accidents/incidents. Specifically, for any significant environmental and social incidents (e.g. fatalities, lost time incidents, environmental spills etc.), the OIZs will inform MoIT PIU in 3 business days. • Notifying MoIT PIU immediately of any contingencies such as environmental, social and labor issues or accidents, incidents or loss of time that has or is likely to have a significant adverse impact on the environment, affected communities, the public or workers. The incident report including root cause analysis, precautions and compensation measures taken, will be submitted to MoIT in 30 business days. • Implementing the Grievance Mechanism in line with the ESMP and WB ESS10 and other relevant requirements. • To provide training to the project personnel of the Contractor and their own personnel on ESMP implementations, CoC, OHS, GM, GBV, SEA/SH trainings and commitments, which covers project related environmental and social impacts and risks, and corresponding measures applied to avoid, reduce, and mitigate the risks and potential adverse impacts, roles and responsibilities assigned to the relevant party, monitoring plan and reporting process prior to the construction activities are commenced • Preparing the bidding documents during the implementation, conducting bidding processes. The requirements of the WB and the Construction Contract including this ESMP and LMP will be chased and cooperating with the MoIT PIU for the supervision of construction activities • Supervision of construction and/or rehabilitation works and installation of equipment,
E&S Consultant	• Preparation and finalizing this ESMP as per the concerns/opinions of the stakeholders of the Project for the approval of MoIT PIU and WB, • Support the PMU to organize and carry out the stakeholder consultation meeting for the first draft of this ESMP, • Organizing and delivering a training to the respective OIZ and Contractor on ESMP implementations and commitments, which covers project related environmental and social impacts and risks, and corresponding measures applied to avoid, reduce, and mitigate the risks and potential adverse impacts, roles and responsibilities assigned to the relevant party, monitoring plan and reporting process prior to the construction activities are commenced.
Contractor	• Fulfillment of all requirements of the ESMP and the other relevant management plans, • Implementation of additional commitments to be included in the Construction Contract,

Responsible Entity	Responsibilities
	• Preparation of its site-specific sub-management plans in line with this ESMP, including OHS plans before construction, as part of their method statement and submit to the OIZ PMU and MoIT PIU for reviewing and approval, • Ensuring compliance with project standards, obtaining all relevant permits and licenses, • Implementing the mitigation measures provided in this ESMP and monitoring of construction activities (including subcontractor activities) in compliance with the national legislation and WB standards, • Employment of competent Environmental, and Social (at least one Environmental and Social Expert, one full-time OHS Expert) within the scope of the project, • Preparing the OHS plan and Risk Assessments by the OHS Expert, • Training its own and subcontractor's staff on environmental, social and OHS issues, • Carrying out the environmental and social audits to monitor the ESMP practices on site and report on this to the OIZ PMU, • Submission of Environmental and Social Progress Reports (ESPRs) for safeguard issues, mitigation, results, and findings throughout the construction period to the OIZ PMU, • Notify immediately of any contingencies such as environmental, social and labor issues or accidents, incidents, or loss of time to OIZ PMU and keep an event log on site throughout the life of the Project. The incident report including root cause analysis and the corrective actions to be taken will be submitted to OIZ PMU within 30 days, • The LM Plan which will be prepared by the Contractor will also comply with the Labor Legislation (Labor Law No. 4857), Occupational Health and Safety Plan and Procedures (Occupational Health and Safety Law No. 6331) and 5510 Social Insurance Law. • Developing and implementing LM Plan (based on Project's LMP and in compliance with the Labor Legislation (4857 Labor Law), Occupational Health and Safety Plan and Procedures (6331 Occupational Health and Safety Law) and 5510 Social Insurance Law) including working conditions, fair treatment, non-discrimination, equal opportunity, vulnerable/disadvantaged workers, GBV, SEA/SH, prohibition of child labor and forced labor issues under the project's Labor and Employment Policy for construction phase. • Establishment and implementation of project specific grievance mechanism for the Project construction activities in coordination with OIZ PMU. • Providing OHS, Code of Conduct, GM, GBV, SEA/SH trainings to OIZ PMU and Contractor personnel.

10.2 Reporting

Documentation is an important element linked to the implementation of the ESMP. Responsibilities will be assigned to relevant personnel for ensuring that the ESMP documentation system is maintained, document controlled and distributed to the identified personnel.

Reporting process that should be put into action during the implementation phase of the project are an important tool to record and chase project activities in compliance with the project standards. Therefore, the requirements of such processes are presented in Table 35.

Table 35. Responsibilities for Reporting Process

Responsible Party	Roles & Responsibility
MoIT Project Implementation Unit (PIU)	• Quarterly inform the WB with Environmental and Social Reports (ESRs) to include summary of Environmental and Social Monitoring Reports (ESMRs) on the progress and updates. Quarterly ESRs will highlight any issues arising from non-compliance with ES requirements and how it has been/is being addressed from the ESF requirements point of view. • Submitting the quarterly Grievance Mechanism Report (GMR) to WB • Site visits will be carried out quarterly and environmental and social issues will be examined on site. Findings after the site visit will be included in the quarterly ESRs. • CoC, OHS, GM, GBV, SEA/SH trainings will be given to OIZ PMU and Contractor's Environmental, Social and OHS Specialists before the construction
OIZ Project Management Unit (PMU)	• Review, revise if required, and submit monthly ESMRs to MoIT PIU • Submitting the monthly GMR Contractor GMR to MoIT PIU • Follow up construction activities. This ESMP implementation, CoC, OHS, GM, GBV, SEA/SH training will be given to project employees of Contractor and their own employees and training records will be kept.
Contractor	• Prepare and submit monthly ESMRs covering the progress of the construction activities and environmental, social and OHS issues to the PMU • Submit the monthly GMR to PMU • CoC, OHS, GM, GBV, SEA/SH training will be given to project employees and training records will be kept.

10.3 Training

All employees will be provided with training on environment, social, community and occupational health and safety, labor and security issues by suitably qualified personnel. The following subjects will be covered in these training programs for all employees:

- National and international legislations and its applicability to the Project,
- Occupational health and safety,
- Accident investigation and root cause,
- Roles and responsibilities,
- Environmentally sensitive areas,
- Potential effects of activities,
- The steps and timing required to protect the environment,
- Activities to be avoided,
- Requirements of equipment use in the event of incident and procedures to follow,
- Mitigation measures to implement in the Project,
- Implementation of Environmental and Social Management Plan
- Code of Conduct and GM, GBV, SEA/SH trainings

Details of the trainings within the scope of requirements of this ESMP are also presented in Table 36. This training program is a minimum and should be extended in line with the project requirements.

Table 36. Training Program

Training Topics	Responsible Party (Trainer Party)	Target Group	Timing	Duration	Cost
Induction Training[34]	Contractor OIZ PMU	Newly recruited Personnel Personnel of newly contracted subcontractor-service provider.	Whenever needed	Minimum 1 (one) day	No additional cost
OHS and Accident Investigation and Community Health and Safety	MoIT PIU Contractor OIZ PMU	Newly recruited Personnel Personnel of newly contracted subcontractor-service provider.	Whenever needed	Minimum 16 (sixteen) hours (national legislation requirement)	No additional cost
Root Cause Training	Contractor	All personnel	Whenever needed in case of accidents and near misses	Minimum 1 (one) day	No additional cost
Environmental Management System Awareness Training	OIZ PMU	All personnel	Once in a month	Minimum 1 (one) day	No additional cost
ESMP Training	Environmental and Social Consultant	All personnel	Once before implementation	Minimum 1 (one) day	No additional cost
Training on GBV and SEA/SH	MoIT PIU	OIZ PMU Contractor	Once before implementation	Minimum 1 (one) day	No additional cost
Training on GBV and SEA/SH	OIZ PMU Contractor	All personnel	Once before implementation and later whenever needed	Minimum 1 (one) day	No additional cost
Training on GM	MoIT PIU	OIZ PMU Contractor	Once before implementation	Minimum 1 (one) day	No additional cost
Training on GM	OIZ PMU Contractor	All personnel	Once before implementation and later whenever needed	Minimum 1 (one) day	No additional cost
Training on Chance Find Procedure	Contractor OIZ PMU	All personnel	Once before implementation and later whenever needed	Minimum 1 (one) day	No additional cost

[34] OIZ PMU will provide this training to the contractor and the contractor will provide this training to its new staff.

11.STAKEHOLDER MANAGEMENT UNDER ESMP

TOIZsP's SEP[35] will be adapted for the Project. This chapter contains a brief description of stakeholder engagement. The Project's SEP has data and explanations on this subject. As mentioned above, the TOIZsP Stakeholder Engagement Plan (SEP), will be used for this sub-project and all project parties (including contractor, Organized Industrial Zone (OIZ) and Ministry of Industry and Technology (MoIT) PIU) will be responsible for ensuring compliance with the TOIZsP SEP.

A stakeholder is defined as any individual, organization or group who is potentially affected by the Project or who has an interest in the Project and its impacts. The objective of stakeholder identification is to establish which stakeholders may be directly or indirectly affected – either positively or negatively - ("affected parties") or have an interest in the Project ("other interested parties").

The term "project affected parties" includes those likely to be affected by the project because of actual impacts or potential risks to their physical environment, health, security, cultural practices, well-being, or livelihoods. These stakeholders may include individuals or groups, including local communities.

The term "other interested parties" refers to individuals, groups, or organizations with an interest in the project, which may be because of the project location, its characteristics, its impacts, or matters related to public interest. For example, these parties may include regulators, government officials, the private sector, the scientific community, academics, unions, women's organizations, other civil society organizations, and cultural groups.

The environmental and social impact area of the project is determined as a circle with a radius of 600 meters from the land SPP project area. The impact area has been determined considering environmental and social impacts, especially sensitive receptors in the vicinity of the project area. However, the impact area does not include sensitive receptors.

Within the scope of the project, interviews were held with neighboring facilities near the land SPP. The OIZ manager and the employees of the OIZ Administrative Building were also interviewed. In addition, since Gümüşhane OIZ is located within the borders of Harmancık village and near the Yeniyol village. The mukhtars of Harmancık and Yeniyol were also held meetings. The outputs of the realized interviews are given in detail as a Minutes of Meeting under Annex-16.

Detailed information about stakeholders is given in Table 37.

[35] Stakeholder Engagement Plan of "TURKEY ORGANIZED INDUSTRIAL ZONES PROJECTS": https://yesilosb.sanayi.gov.tr/assets2/pdf/projectdocuments/2.1-StakeholderEngagementPlan.pdf

Table 37. Stakeholders Details

Stakeholders	Number of Employees	Number of Visitors	Identification of Stakeholders	Relation	Relevance of Stakeholders to the Project	Distance to Project Area (m)
OIZ Administrative Building	11	40	PAP	Direct	The workers to be employed under the Project will use the building for their daily dining routines and hygiene needs.	181
Duranoğulları Orm. San. Tic. Ltd. Şti	4	1	PAP	Direct	The neighboring facility next to the land SPP site. Employees and visitors of the building can be affected Project related activities due to the noise and dust.	72
Derda Yapı Sanayi Ticaret Limited Şirketi	6	1	PAP	Direct	The neighboring facility next to the SPP area. Employees and visitors of the building can be affected Project related activities due to the noise and dust.	12
Project Workers	10	-	PAP	Direct	Workers who will work during the construction phase of the project are also among the stakeholders.	-
Local residents of Harmancık Village	-	-	OIP	-	Nearby residential area. The neighborhood can expect to benefit from employment opportunities within Gümüşhane OIZ. Population of Harmancık village is 77.	2,100
Mukhtarship of Harmancık Village	-	-	OIP	-		2,100
Local residents of Yeniyol Village	-	-	OIP	-	Nearby residential area. The neighborhood can expect to benefit from employment opportunities within Gümüşhane OIZ. Population of Harmancık village is 262.	2,200
Mukhtarship of Yeniyol Village	-	-	OIP	-		2,200

Project affected parties and other interested parties affected by the project will differ depending on the project phase. The visible environmental impacts during the construction and installation phases of the Project will affect employees as well as visitors.

The construction of the SPP will take three (3) months. Ten (10) workers expected to be involved in the project will also be considered as stakeholders among those affected by the project. These workers are expected to use the OIZ Administration Building for their daily dining routines and hygiene needs.

11.1 Previous Stakeholder Engagement Activities

A site visit was conducted on 22nd of July, 2024. Photographs from the stakeholder interviews are presented in Annex-5.

11.2 Disclosure and Consultation of the ESMP

As part of the requirements of WB ESF and ESSs, this ESMP is to be publicly disclosed and consulted as part of the responsibility of the Project Implementation Unit / Project Owner. The final approved ESMP to be disclosed will be available locally and as hard copies at the Gümüşhane OIZ offices and places easily accessible to affected groups through Headman's offices. Furthermore, it will be published on Gümüşhane OIZ's website and MoIT Project page:

- https://gumushaneosb.org.tr/
- https://yesilosb.sanayi.gov.tr/

The stakeholder consultation meeting documents (photos, disclosure announcements, etc.) will be added in the final version of this ESMP after the meeting is performed.

A range of tools will be utilized for stakeholder engagement under this Project. Different engagement methods are proposed and cover different stakeholder needs for before construction, during construction and operation phases as stated below:

- Formal/ informal face-to-face meetings,
- Digital communication tools (including web pages, correspondence by phone/email, whatsapp, short message service),
- Written materials,
- Grievance mechanism,
- Media promotions.

A Stakeholder Consultation Meeting (SCM) will be conducted before the approval of this Draft ESMP. During the meeting, details about the project, its potential environmental and social impacts/risks, mitigation measures to be taken, and implementation/monitoring/reporting responsibilities of different parties will be shared with the stakeholders; and then their opinions and suggestions will be received during the question-answer (Q&A) session and the ESMP finalized accordingly. Minutes of the Stakeholder Consultation will be prepared and published on the Gümüşhane OIZ website (https://gumushaneosb.org.tr/) and MoIT PIU website (yesilosb.sanayi.gov.tr).

11.3 Grievance Mechanism

The grievance mechanism is monitored within a transparent and open framework to address, assess and resolve Project-related grievances.

The main aim of the grievance mechanism is to assist in resolving complaints and grievances in a timely, effective, and efficient manner that satisfies all parties involved. The GM (and also workers' GM) will be effective during the lifespan of the project. It is intended to serve as a mechanism to:

- Allow identification and impartial, timely and effective resolution of issues affecting the project,
- Strengthen accountability of the beneficiaries, including project-affected stakeholders,
- Provide channels for the stakeholders to provide feedback and raise concerns.
- Offer a consultation process that is clear, transparent, culturally sensitive, and easily accessible.
- Provide the option for anonymous complaints and feedback, particularly in cases related to GBV, SEA and SH.
- Recognize that grievances concerning community health, safety, and environmental risks may be urgent, especially in cases of accidents, communicable diseases, and pollution. Immediate actions must be taken to address and prevent further harm.

In addition to public GM, the ESS 2 requires the establishment of a Workers' Grievance Mechanism for the project workers. Constitution of WGM will be under the responsibility of the Contractor in accordance with its LM Plan which will be prepared in line with Project's LMP. The project workers will use the WGM to convey their concerns or suggestions regarding their working conditions and workplace.

Any grievance, complaint, feedback, question, suggestion, concern etc. received is sent to the relevant department will be appointed by Project PMU, logged in the project specific GM database, and categorized according to the following inputs:

- Project related activities
- Project labour force
- Issues related to resource use, sustainability, and pollution
- Community health and safety issues
- Chance finds
- Risk on biodiversity if any
- Chance finds if any
- Stakeholder engagement

The sample forms can be used to for GM are given in Annex-13, Annex-14, and Annex-15.

In order to foster open communication and ensure a steadfast commitment to addressing stakeholders' concerns promptly and effectively, OIZ PMU and MoIT PIU will be implemented the following steps:

1) OIZ PMU and MoIT PIU will actively encourage stakeholders to provide a detailed description of their grievances via e-mail, and the dedicated grievance inbox may be utilized for this purpose.

2) Traditional correspondence will remain a viable option, allowing stakeholders to choose to direct a letter detailing their grievances to the grievance focal points at their local administration.

3) A standardized grievance registration form will be made available for use, and stakeholders will be able to submit it through any of the aforementioned channels, ensuring consistency in information collection.

4) For those who prefer face-to-face interaction, CLO/GM Focal Point will ease the registration of a grievance in the grievance logbook at any facility. Alternatively, stakeholders will have the choice to drop a written grievance into the complaint boxes located at the administrative building of OIZ PMU and MoIT PIU.

5) All grievances to be registered in central database to facilitate tracking and analysis.

11.3.1 Procedural Steps of GM

The relevant activities within the public GM are provided in Table 38.

Table 38. Grievance Mechanism Implementation

Step	Description of Process	Time Frame	Responsibility
GM implementation structure	The GM will become effective in the pre-construction phase. Main responsibilities of Project level implementation will be conducted by OIZ PMU. At the national level CIMER[36] and YİMER[37] can be defined as a complaint mechanism. Besides, MoIT level GM and Project Level GM will be implemented, too.	During project life time	CİMER YİMER MoIT PIU OIZ PMU Contractor CLO/GM Focal Point
Grievance uptake	Grievances are submitted using any communication channel identified in the GM. 1) OIZ phone number (04562135492) 2) E-mail (info@gumushaneosb.org.tr) 3) Complaint boxes (Administrative building located in official address as *Yoncalı OSB Harmancık Mevkii 1. Sokak No: 2/1 Merkez/Gümüşhane*) 4) Letter to Grievance focal points (will be appointed)	Throughout the life of the project	MoIT PIU OIZ PMU Contractor CLO/GM Focal Point
Sorting, processing	MoIT PIU and OIZ PMU will be responsible.	Upon receipt of complaint	CLO/GM Focal Point
Acknowledgment and follow-up	The party responsible in this case will be OIZ PMU, appointed by MoIT PIU, and/or GM committee.	Within 2 days of receipt	CLO/GM Focal Point
Verification, investigation, action	The investigation of the complaint is led by Gümüşhane OIZ PMU. A proposed resolution is formulated by Gümüşhane OIZ and communicated to the complainant by appointed unit. Throughout this process, Gümüşhane OIZ PMU, and / or GM committee takes the lead in thoroughly evaluating the complaint and finding a fair resolution. In communication	Within 10 working days	The complaint committee is established to evaluate and investigate unresolved complaints, especially in cases of SEA/SH. It is essential that the legal representative of the victim/survivor be included in the committee. Although the members may have been selected from within OIZ PMU and MoIT PIU, the committee will act independently in decision-making. Therefore, independent experts from

[36] Presidency of the Republic of Türkiye, Directorate of Communications, Presidency's Communication Center,https://www.cimer.gov.tr/
[37] Republic of Türkiye Ministry of Interior Presidency, Foreigners Communication Center, https://yimer.gov.tr/

Step	Description of Process	Time Frame	Responsibility
	with the complainant, the proposed solution is presented in a clear manner, aiming to resolve the complaint fairly and effectively.		outside the OIZ PMU and MoIT PIU will also be included. For cases that have been or may be subject to litigation, a legal advisor and attorney will be included in the committee. Employee representatives, as well as the representatives of the complainant / victim, should also be included in this committee, which includes complaints from employees. The committee should be constituted by OIZ PMU as supported by MoIT PIU and WB. The committee will consist of a representative, appointed members of OIZ PMU, Contractor, , and MoIT PIU. In addition, the specified staff as social specialist, OHS specialist, and technical specialists will be included into the Committee including the representative of the complainant.
Monitoring and evaluation	A report will be generated for OIZ PMU to refer to in terms of risk, preventive measures, and assessment within the operational process to submit MoIT PIU and WB.	Will be decided by MoIT PIU specialists	GM Committee
Provision of feedback	When the resolution stage is reached in the complaint process, the relevant action is presented to the complainant for consent. If the complainant is satisfied with the resolution at this stage, the complaint is closed, the grievance closure form is filled out and the resolution process is started. If the complainant is not satisfied with the proposed solution, support is provided to the complainant to have a project-internal appeal process. This support may involve seeking recourse to another government agency, engaging in legal proceedings, or involving law enforcement, especially in cases involving sensitive groups such as people with disabilities, minors, individuals in low-income groups, women, or victims of harassment and/or violence.	Will be decided by MoIT PIU specialists	GM Committee
Training	Training needs for staff/consultants in the OIZ PMU and MoIT PIU, Contractors, and are as follows: - Social specialist - OHS specialist - Technical experts	It is decided based on the results of monitoring and evaluation reports	MoIT PIU OIZ PMU Contractor
If relevant, payment of reparations	The handling process will cover the general perspective: Assessment: A thorough evaluation will be done to	It is decided based on the results of monitoring and evaluation reports	MoIT PIU OIZ PMU Contractor

Step	Description of Process	Time Frame	Responsibility
following complaint resolution	understand the nature and extent of the harm caused, considering factors like how severe, how long, and potential long-term effects. Amount Determination: Based on the assessment, the proper amount for reparations will be calculated, covering compensation for damages, financial losses, or distress. Recipients: Those directly affected by the harm, whether individuals, communities, or specific groups, will be identified as recipients of reparations. Distribution: A fair and transparent process will be set up to ensure reparations reach the intended recipients. This may include direct payments, community projects, or other forms of restitution depending on the nature of the harm. Monitoring and Reporting: Ongoing monitoring and reporting systems will be in place to track the implementation of reparations. Regular reports will evaluate how well the reparations process is working, allowing for necessary adjustments.		

11.3.1.1 For the Public GM, the CLO is responsible, while for the WGM, the worker representative and the contractor's worker representative are authorized.Existing Grievance Mechanism of the Gümüşhane OIZ

There is no complaint and suggestion box in Gümüşhane OIZ. The e-mail address for complaint reporting is available on website[38].

The existing grievance mechanism will be improved and implemented in line with outlined in this ESMP.

Current contact information of Gümüşhane OIZ are given in below:

- Official website: https://gumushaneosb.org.tr/
- Communication section of the webpage: https://gumushaneosb.org.tr/?page_id=45
- Adress: Yoncalı OSB Harmancık Mevkii 1. Sokak No: 2/1 Merkez/Gümüşhane
- Telephone: 04562135492
- E-mail: info@gumushaneosb.org.tr

11.3.1.2 Workers' Grievance Mechanism

In addition to public GM, the ESS 2 requires the establishment of a Workers' Grievance Mechanism (WGM) for the project workers. Constitution of WGM will be the responsibility of the Contractor in accordance with its LM Plan which will be prepared in line with Project's LMP. This mechanism will be established before the commencement of work to ensure alignment with the requirements of the MoIT GM. The Contractor facilitate WGM to address and resolve any concerns or grievances that may arise among the workforce (including both direct and indirect employees). The project workers will use the WGM to convey their concerns or suggestions regarding their working conditions and workplace. The WGM is defined as the mechanism that receives complaints from Project employees (including subcontractors).

The contractor will provide appropriate channels to uptake formal grievances for the worker, i.e., e-mail, telephone, suggestion boxes. Especially, suggestion boxes should be placed so that anonymous grievances can be made. Handling grievances that are sensitive will be treated in full confidentiality. To enable female work force to safely access the WGM, labor trainings will include information on the various channels of the raising grievances and confidentiality of doing so. In this way, all Project workers will be informed about these WGMs at the time of their recruitment, and their employment contracts will involve detailed information of these WGMs including the ways they can convey their grievances and how these grievances will be recorded, handled, and monitored. The contractors will also ensure that the workers of their subcontractors are aware and can utilize the established WGM.

Contractors will keep the written copies and a written list of complaints submitted to them. In addition, to facilitate analysis, monitoring and reporting, these complaints will be logged into a database, indicating contractor, type of complaint and solution.

Procedural steps of WGM are same as public GM as explained above.

11.3.1.3 Grievances Related GBV/SH/SEA

To properly address SEA/SH risks, the GM will be in place prior to contractors mobilizing. For GBV—and particularly SEA/SH—complaints, there are risks of stigmatization, rejection and reprisals against complainant. This creates and reinforces a culture of silence so complainants may be reticent to approach the project directly. To enable survivors of GBV,

[38] info@gumushaneosb.org.tr

SH/SEA to safely access the GM, multiple channels will be made available through which complaints can be registered in a safe and confidential manner. The GM operators and Community Liaison Officers (CLO) will to be trained in how to collect SEA/SH cases confidentially and empathetically (with no judgement).

Grievance Mechanism tools will be published on Gümüşhane OIZ website (https://gumushaneosb.org.tr/) and MoIT PIU website (yesilosb.sanayi.gov.tr).The following items are given as below as the tool of the GM;

- OIZ phone number (04562135492)
- E-mail (info@gumushaneosb.org.tr)
- Complaint boxes (Administrative building located in official address as Yoncalı OSB Harmancık Mevkii 1. Sokak No: 2/1 Merkez/Gümüşhane)
- Letter to Grievance focal points (will be appointed)

Beside the tools mentioned above, the anonymous Grievances can be also submitted via the following channels:

- Telephone
- Letter to Grievance focal points at local facilities
- Suggestion box

Besides, SEA/ SH and GBV survivors to the Ministry of Family and Social Services call center (ALO 183) for SEA/SH, and to the Ministry of Labor and Social Security call center (ALO 170).

Projects will have multiple complaint channels. No identifiable information on the survivor will be stored in the GM. The GM will not ask for, or record, information on more than the following related to the SEA/SH allegation:

- The nature of the complaint (what the complainant says in her/his own words without direct questioning);
- If, to the best of the survivor's knowledge, the perpetrator was associated with the project;
- If possible, the age and sex of the survivor; and
- If possible, information on whether the survivor was referred to services.

The information in the GM will be confidential especially when related to the identity of the complainant.

Grievances can be submitted via the channels presented under the above section on GM.

REFERENCES

- The World Bank, Environmental and Social Framework,2017
- Bank Directive, Environmental and Social Directive for Investment Project Financing, November 2021
- Gümüşhane OIZ Solar Power Plant Project Identification Document (PID), MRC Türkiye & ACE Consulting and Engineering
- Gümüşhane OIZ Solar Power Plant Project Environmental and Social Screening Reports and Screening Forms MRC Türkiye & ACE Consulting and Engineering
- Gümüşhane Provincial State of Environmental Status Report, https://webdosya.csb.gov.tr/db/ced/icerikler/gumushane_-cdr2022-20231013125840.pdf
- 2023 Traffic Volume Maps, Ministry of Transport and Infrastructure, General Directorate of Highways
- Corine 2020 Version Data
- Turkish Statistical Institute, Address Based Population Registration System, 2023
- Gümüşhane Provincial Disaster Risk Reduction Plan, Provincial Disaster Risk Reduction Plan, AFAD, 2022
- Interactive Earthquake Risk Map, AFAD, (https://tdth.afad.gov.tr/)
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- MaF, GDoM, Climate of Türkiye According to Köppen Climate Classification, January 2016.Link: chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.mgm.gov.tr/FILES/iklim/iklim_siniflandirmalari/koppen.pdf
- https://www.mgm.gov.tr/veridegerlendirme/il-ve-ilceler-istatistik.aspx?k=A&m=GUMUSHANE
- MoEUCC National Air Quality Monitoring Network, https://www.havaizleme.gov.tr/
- https://sim.csb.gov.tr/STN/STN_Report/StationDataDownloadNew
- https://www.doka.org.tr/bolgemiz_Gumushane-TR.html

LIST OF ANNEXES

Annex-1 Official Correspondences, Permits and Licenses

Annex-1.1 EIA Exemption Letter

Annex-1.2 Environmental Permit (air and noise) Exemption Letter

Annex-1.3 Contract with Environmental Consultant

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Annex-1.5 DSI Letter for Groundwater Usage

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Annex-1.7 Letter on Environmental Permit Process

Annex-1.8 OIZ Establishment Protocol

Annex-1.9 WWTP Approval Letter

Annex-1.10 Zero Waste Certificate (29.07.2021-29.07.2026)

Annex-1.11 OIZ Declaration related with WWTP

Annex-1.12 11.12.2023 Dated Official Letter

Annex-2 Tittle Deed (142/1 Parcel)

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Annex-5 Site Photographs

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Annex-15 Sample Grievance Log

Annex-16 Minutes of Meetings