TÜRKİYE PETROLLERİ ANONİM ORTAKLIĞI

OTC OFFSHORE TECHNOLOGY CENTER

SAKARYA GAS FIELD DEVELOPMENT PROJECT – ENHANCEMENT OF SUBSEA PRODUCTION CAPACITY AND FLOATING PRODUCTION UNIT

Non-Technical Summary

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ABBREVIATIONS

Abbreviation	Definition
AoI	Area of Influence
BOTAŞ	Turkish Petroleum Pipeline Corporation
CLC	Coastal Logistics Center
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
dB	Decibel
ECA	Export Credit Agency
E&S	Environmental and Social
EIA	Environmental Impact Assessment
EP	Equator Principles
EPCI	Engineering, Procurement, Construction and Installation
E&S	Environmental and Social
EHS	Environment, Health and Safety
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EU	European Union
FCG	Flooding, Cleaning and Gauging
FMS	Fiscal Metering Station
g	Grams
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GLC	Ground Level Concentration
HC	Hydrocarbon
HR	Human Resources

Abbreviation	Definition
IBA	Important Bird Area
IMO	International Maritime Organisation
KBA	Key Biodiversity Area
Kg	Kilogram
kHz	Kilohertz
KM	Kilometre
KPI	Key Performance Indicator
kt	Kilo tonne
$ktCO_{2e}$	Kilo Tonnes of Carbon Dioxide Equivalent
LRP	Livelihood Restoration Plan
M	Meter
m^3	Cubic meter
MEG	Mono-Ethylene Glycol
$MMSm^3$	Million metric standard cubic meter
MARPOL	The International Convention for the Prevention of Pollution from Ships
SCMD	Standard cubic meter per day
MoEUCC	Ministry of Environment, Urbanisation and Climate Change
N/A	Not Applicable
NH_4	Ammonium
NO_x	Nitrogen Oxides
ODS	Ozone Depleting Substance
OECD	The Organization for Economic Cooperation and Development
OHS	Occupational Health and Safety
OHSAS	Occupational Health and Safety Assessment Series
OPF	Onshore Production Facility
PIG	Pipeline Inspection Gauge

Abbreviation	Definition
PLET	Pipeline End Termination
PM	Particulate Matter
PPM	Public Participation Meeting
PS	Performance Standard
SEP	Stakeholder Engagement Plan
SGFD	Sakarya Gas Field Development Project (Unless otherwise stated, Project refers to the Phase 2 of the investment. SGFD Phase 2 is the topic of this ESIA)
SIA	Social Impact Assessment
Sm^3	Standard cubic meter
SO_2	Sulphur Dioxide
SPS	Subsea Production System
SURF	Subsea Umbilical, Risers and Flow Lines
T	Temperature
t	tonnes
tCO_{2e}	Tonnes of carbon dioxide equivalent
TANAP	Trans-Anatolian Natural Gas Pipeline Project
TCFD	Task Force on Climate-related Financial Disclosures
TPAO	Turkish Petroleum Corporation
TP-OTC	Turkish Petroleum Offshore Technology Center A.S.
TTK	Turkish Hard Coal
WD	Water Depth
WWTP	Wastewater Treatment Plant
XT	Xmas Tree

1.0 INTRODUCTION

Turkish Petroleum Corporation (TPAO or Project Owner) has been established in order to perform hydrocarbon exploration, drilling, production, refinery and marketing activities on behalf of the Turkish Republic with the Law no 6327, in 1954.

On 12th March 2019, Turkish Petroleum Offshore Technology Centre (TP-OTC or Project Executor) was founded upon a Resolution of the Board of Directors of the main company TPAO. The name TP-OTC was registered on 2 April 2019 following this resolution, and the company was structured specifically for the conducting of maritime operations.

TP-OTC, 100% owned by TPAO will be conducting Project Management and Engineering, Procurement, Construction and Installation (EPCI) for the Sakarya Gas Field Development Project (SGFD Project or the Project) which has been initiated by the TPAO to extract, transport to shore and process the natural gas discovered in the Sakarya Gas Field, in the exclusive economic zone of Türkiye, off the Western Black Sea Region, and the natural gas reserves to be discovered through the ongoing exploration. TP-, 100% owned by TPAO will be conducting Project Management and Engineering, Procurement, Construction and Installation (EPCI) for the Project.

The SGFD phases are as follows:

- **Phase 1:** Involves natural gas production with the subsea production system (SPS) from 10 wells in the Sakarya Gas Field. The gas is transported onshore through an approximately 170 km long, 16-inch (40.64 cm) diameter steel pipeline, processed at the Onshore Processing facility (OPF), and delivered to the Petroleum Pipeline Corporation (BOTAŞ) via the existing 36 km Western Black Sea Phase - 1 Pipeline. OPF has a daily production capacity of up to 10 million standard cubic meters (Sm^3). The infrastructure for Phase 1, including the SPS, SURF (Subsea Umbilicals, Risers, and Flowlines), and OPF, has been installed. The first gas arrival onshore was achieved in 2023, with an initial production of 2.8 million Sm^3/day. Currently, the production capacity has reached over 6 million Sm^3/day.
- **Phase 2 (the Project):** 13 additional wells are planned for the Sakarya Gas Field, with 2 connecting to the existing subsea production system and the remaining 11 linking to a new subsea production system to be installed and will be processed within a floating production unit (FPU). The gas from these wells will be transported to the OPF or processed in the FPU before being sent onshore via approximately 170 km, 16-inch steel pipeline to BOTAŞ. Phase 2 aims to boost total production capacity to 20.5 million Sm^3/day, adding 10.5 million Sm^3/day to the current capacity. The gas will be delivered to the national grid via the 175 km Western Black Sea Phase - 2 Pipeline to be built and operated by BOTAŞ.
- **Phase 3**: TP-OTC plans to continue natural gas production in the Sakarya Gas Field by drilling approximately 44 additional wells and processing the extracted gas using a new Floating Production Unit (FPU). This phase aims to bring the total number of wells to around 67 across all planned phases, with a projected maximum raw gas production capacity of 46.5 million Sm^3/day. Currently in the design stage, Phase 3 is expected to commence in parallel to Phase 2 execution.

For the Phase 1 stage, an Environmental and Social Impact Assessment (ESIA, here in after referred to as the Phase 1 ESIA) prepared in accordance with the IFC Performance Standards and the Equator Principles was disclosed in December 2022. Outcomes of the Phase 1 ESIA were integrated in TP-OTC's Management System.

The Phase 1 ESIA, Stakeholder Engagement Plan (SEP), Non-Technical Summary (NTS) and the LRP prepared for the Phase 1 of the SGFD can be found on the TP-OTC web site:

https://tp-otc.com/en/sustainability/environmental-and-social-impact-assessment-en/
https://www.tpao.gov.tr/en/environmental-and-social-impact-assessment

This Non-Technical Summary (NTS) briefly explains the outcomes of the Project Environmental and Social Impact Assessment (here in after referred to as the ESIA) prepared for the FPU, SURF, SPS, export gas pipeline components of the Phase 2 of the Sakarya Gas Field Development Project and reflects TP-OTC's ongoing commitment to provide stakeholders with clear, relevant and sufficient information to enable a proper understanding of the Project.

Based on the Project ESIA outcomes, an updated Environmental and Social Management Plan (ESMP) has been defined and will be implemented during the Project construction and the operation stages. The ESMP defines the processes and resources put in place as part of TP-OTC's commitment to avoid, mitigate and effectively manage environmental, health & safety and social risks and impacts.

This commitment complies with the national requirements of the Project's host country (Türkiye), and the following key international standards for managing the Project's environmental, social, health and safety risk.

Applicable Environmental and Social Requirements of the Project, are defined based on the IFC Performance Standards (PS), Guidance Documents, IFC Sectoral and General EHS Guidelines, Equator Principles (EP), and the National Turkish legislation.

Every effort has been made to ensure that the information contained in this NTS is correct at the time of its release. Further information on the Project and the ESIA process can be accessed as follows:
https://tp-otc.com/en/sustainability/
https://www.tpao.gov.tr/en/environmental-and-social-impact-assessment

2.0 SAKARYA GAS FIELD DEVELOPMENT PROJECT

With its developing economy, Türkiye is among the world's major energy consumers. When the sectoral distribution of natural consumption in 2023 is calculated as a percentage; residential consumption is 33.79%, consumption for electricity generation is 27.72%, and industrial consumption is 24.48%.[1]

Türkiye is a country that is heavily dependent on imports of natural gas. The rate of foreign dependency in natural gas consumption is higher than oil, and approximately 98.43% of Türkiye's natural gas consumption is met by imports. While approximately 50.21 billion m^3 of natural gas was consumed in Türkiye in 2023, only 1.57% of this amount (788 million m^3) was met by domestic production.

The Blue Stream Natural Gas Pipeline and Turk Stream Gas Pipeline between Russia and Türkiye, the natural gas pipeline between Iran and Türkiye, Trans-Anatolian Natural Gas Pipeline Project (TANAP) between Azerbaijan and Türkiye were built and put into operation for supply through pipeline. TANAP and Turk Stream Gas Pipelines also reach Europe over Türkiye and contribute to meet Europe's natural gas demand.

Natural gas import has become mandatory for Türkiye due to the fact that domestic reserves and production amounts remain at very limited levels in order to meet the current and potential use of natural gas, whose usage rate and areas are increasing due to the advantages it has in parallel with the increase in energy demand.

[1] TR. Energy Market Regulatory Authority (EPDK), Natural Gas Market 2023 Sector Report, 2023

However, a shortage of supply is encountered frequently due to political issues or technical problems. Due to these reasons arising from suppliers and transit countries and technical reasons, Türkiye has faced with difficulties in maintaining the daily supply-demand, especially in winter.[2]

Offshore exploration activities, which were accelerated in order to increase the rate of meeting Türkiye's increasing oil and natural gas demand with domestic production, gave its first results with the natural gas reserve detected in the Sakarya Gas Field in 2020.

The SGFD Project is the first deepwater gas field discovery and the biggest natural gas reserve in the country. Within the scope of the Project, an annual production of 3.5 billion m^3 will be achieved in Phase 1, followed by an annual production of 14 billion m^3 in Phase 2, and 30% of Türkiye's total consumption will be met. It is estimated that the project will start production in 2023 and the natural gas needs of approximately 2.5 million households will be met in Phase 1. With the realization of the Project, Türkiye will be able to use its own resources in the near future, and thus, will decrease the share of energy in total importation significantly and make great contributions to the country's economy.

2.1 Project Location

The SGFD Project aims to extract, transport onshore and process the natural gas discovered in the Sakarya Gas Field based in the exclusive economic zone of Türkiye, off the Western Black Sea Region, to make it available for use by consumers.

Sakarya Gas Field is located within the Sakarya Gas Field Block C26 in the western Black Sea, approximately 170 km offshore from Filyos, Zonguldak, at a depth of approximately 2,200 m, within the Türkiye exclusive economic zone.

The Phase 2 Project consists of addition of the Subsea Production System (SPS), FPU and new offshore pipeline, to the existing facilities built during the Phase 1 stage. Two of the first 13 offshore wells to be drilled within the scope of Phase 2 will be connected to the existing infrastructure of Phase 1 and 11 wells (Phase-2) will be connected to the FPU and sent to shore as processed gas. FPU, will be close to the wells, approximately 170 km away from the Filyos coastline.

Additionally, a new offshore export pipeline of approximately 170 km, running close to the existing Phase 1 offshore pipeline, will be built to connect the FPU to the existing tie-in point of BOTAŞ, then measured at the existing Fiscal Metering Station (FMS) and offloaded to the 175 km Western Black Sea Phase -2 Pipeline to be built by BOTAŞ.

Layout showing SGFD Project Phase 2 is presented in Figure 1.

[2] TR. Energy Market Regulatory Authority, 2023, Natural Gas Market 2023 Sector Report

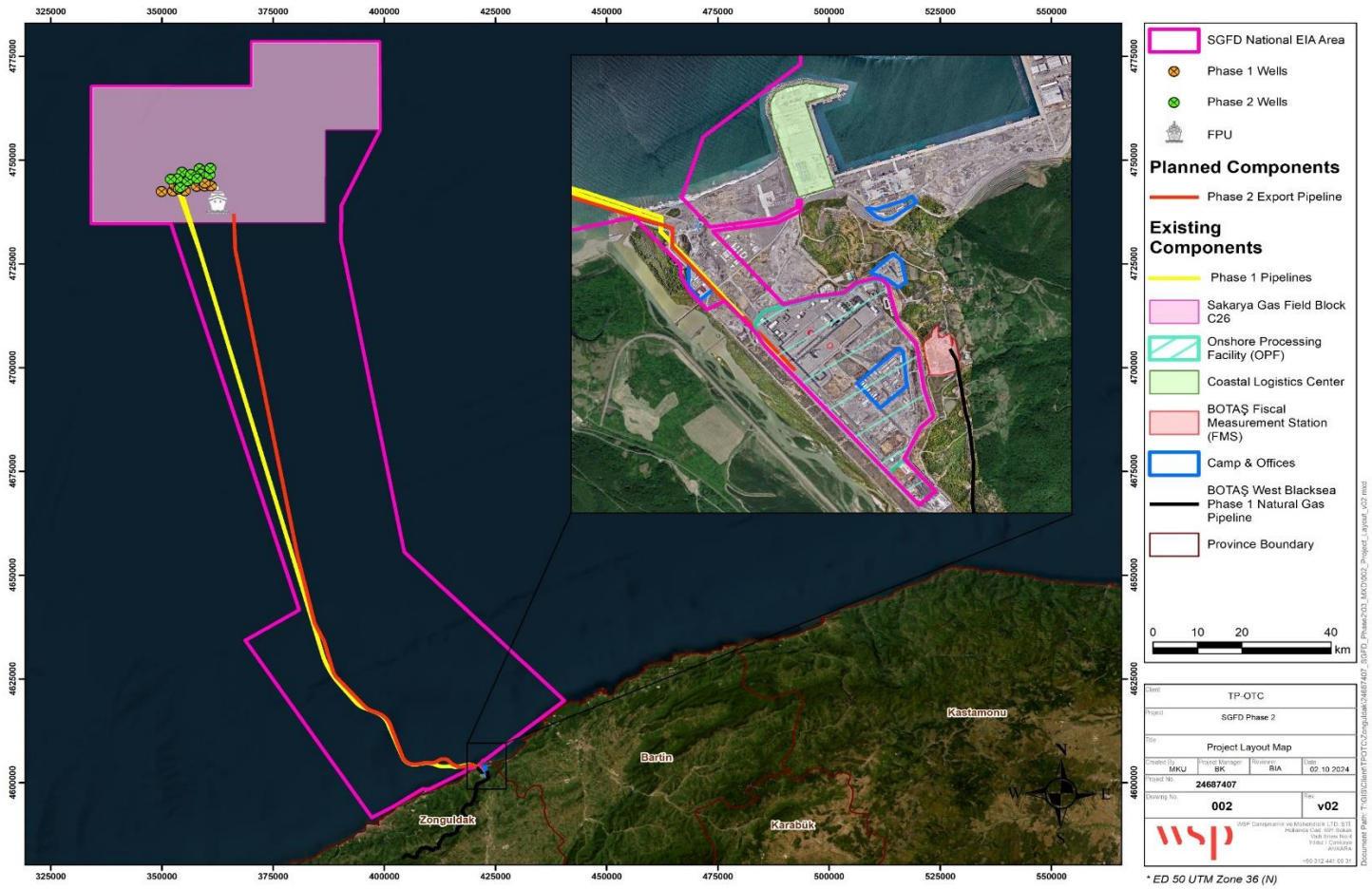

Figure 1: Sakarya Gas Field Development Project Phase 2 Layout

The Sakarya Gas Field Development Project investment is planned to be realized in three phases, Phase 1, Phase 2 and Phase 3. Other facilities related to the Project are the Coastal Logistic Centre (CLC) and the Filyos Port. The Coastal Logistics Center will be used for the temporary storage of pipes and equipment; as a workshop/maintenance area during the construction phase: and for marine vessel berthing.

Figure 2: Aerial View of the CLC

The Filyos Port will primarily serve the Filyos Industrial Zone, which is planned to be established across the Filyos River. In the scope of the Project, Filyos Port will be used for support vessel berthing, Subsea Production System (SPS) equipment maintenance and new module installation, integration, onshore commissioning of FPU

2.2 Project Components

The Project (Phase 2) consists of four main units:

- Subsea Production System (SPS),
- Subsea Umbilicals, Risers, and Flowlines (SURF),
- Floating Production Units (FPU), and
- An export pipeline for the transportation of processed gas from the FPU to the onshore connecting to the tie-in point to the BOTAŞ onshore natural gas grid.

In Figure 3, flow chart of the Phase 2 is presented.

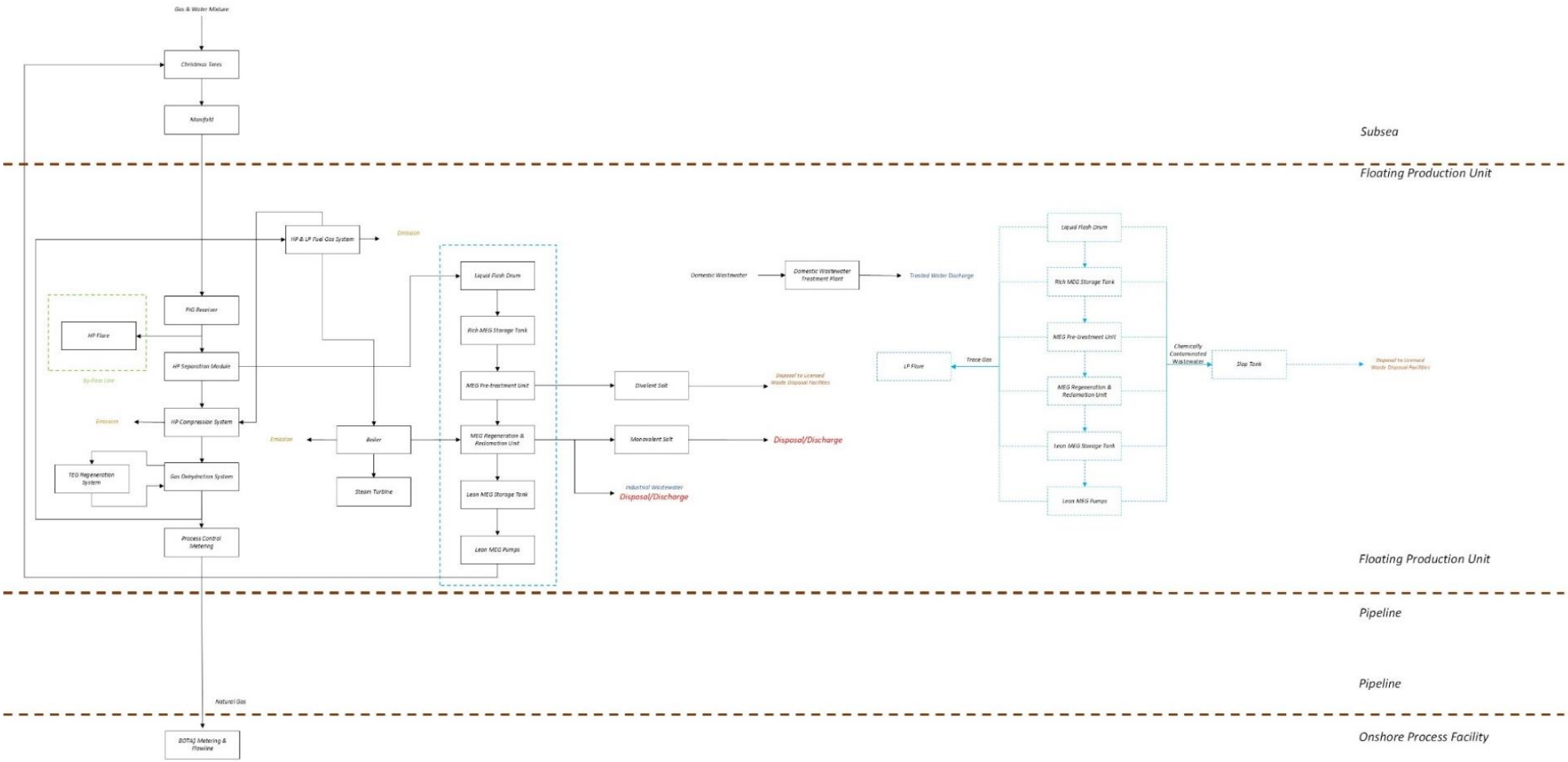

Figure 3: Flow Chart of Phase 2

Subsea Production System (SPS)

A new SPS for Phase 2 will be installed to control the production flow of natural gas extracted from 11 new subsea wells. The SPS will include subsea equipment such as wellheads, Xmas trees (XT, valve assemblies placed on top of the wellheads), a production manifold, and control systems. These components will work together to control and measure the extraction process.

Wellheads and Xmas trees will be installed on the seabed, providing the necessary interface for extracting natural gas from the reservoirs. The wellheads serve as the termination points for the wells, allowing for the management of production, injection, and monitoring activities. Xmas trees, which include valves and control mechanisms, will enable operators to regulate the flow of gas and fluids during extraction.

The production manifold will collect the extracted gas and water liquid streams from multiple wells and direct them into the flowlines of the SURF system for further transport and processing. It will facilitate the distribution of fluids to the appropriate flowlines while ensuring efficient management of production from all connected wells. The production manifold also contains piping for receipt of MEG from the FPU and further distribution to the individual wells.

Control systems will remotely monitor and adjust operations to maintain optimal flow conditions and ensure safety. These systems will incorporate various sensors and instrumentation to track parameters such as pressure, temperature, and flow rates, allowing for real-time data analysis. Primary control of the Phase 2 subsea wells will be from the Phase 2 FPU control room.

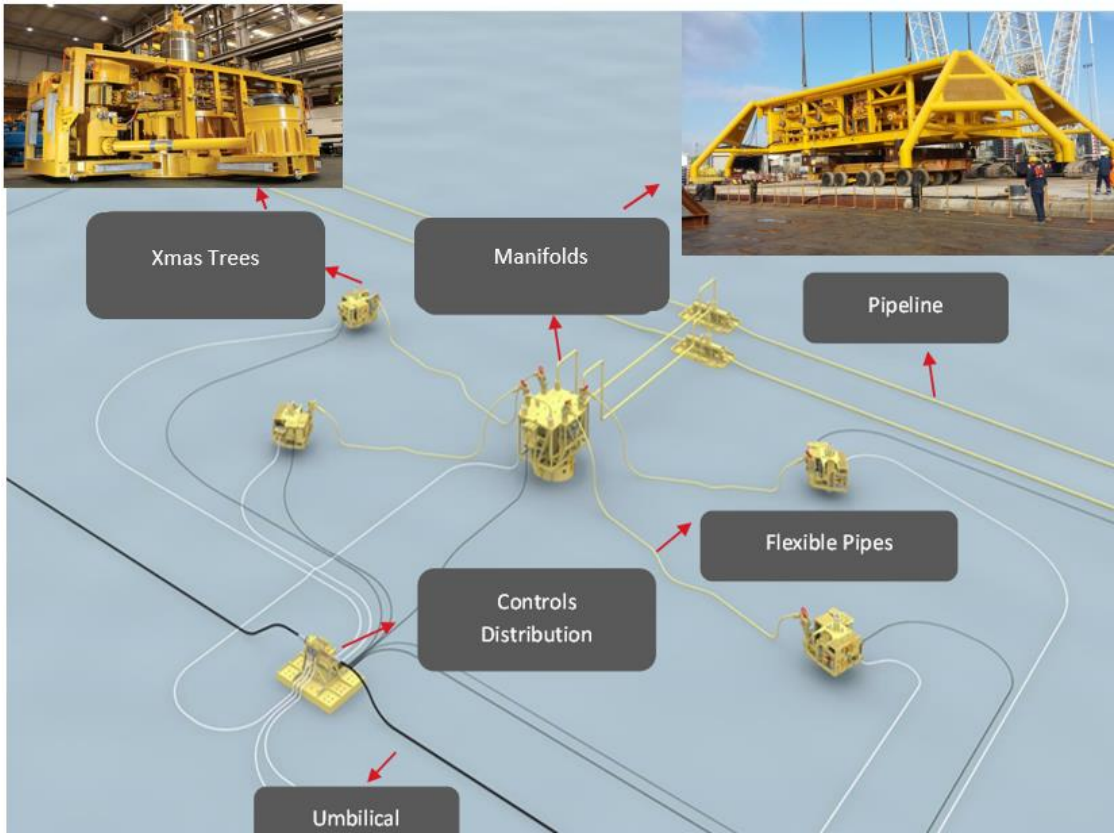

Figure 4: Illustration of Subsea Production System

Subsea Umbilicals, Risers, and Flowlines (SURF)

Within Phase 2, a new SURF system will be installed to provide the infrastructure for transporting extracted gas and water liquid streams from the SPS to the FPU. The SURF system will consist of subsea flowlines, risers, a monoethylene glycol (MEG) (a chemical using to prevent the water in the gas from freezing or forming hydrates) line from the FPU to the manifold, a main umbilical between the FPU and the manifold, and well umbilicals for MEG injection.

Subsea flowlines will transport the gas horizontally from the manifold to the risers. The risers will accommodate the vertical movement of the gas, facilitating its transport from the seabed to the surface facilities on the FPU.

The MEG line will connect the FPU to the manifold, supplying MEG to prevent hydrate formation in the gas during extraction and transportation.

The main umbilical will connect the FPU and the manifold, enabling the transmission of electrical power, hydraulic control, and communication signals. This setup allows for monitoring and remote operation of the subsea systems, supporting production operations.

Well umbilical will connect the manifold to the individual subsea wells, facilitating the injection of MEG and other necessary fluids.

Floating Production Unit (FPU)

A Floating Production Unit (FPU, Figure 5) will be used to process the extracted natural gas to meet the BOTAŞ sales standards before exporting it to the onshore via export pipeline.

Figure 5: FPU arriving in Türkiye, prior to modification

The FPU that will be used in the Project is a former very large crude carrier (VLCC) trading tanker converted into a floating production storage and offloading (FPSO) in 2008/2009 and operated in Brazil from 2009 until

2015. Now re-designated as an FPU, it will be refurbished and modified and re-deployed to the Black Sea to suit the Sakarya Gas Field for operations in a water depth (WD) of approximately 2,200 meters.

The vessel arrived at a Çanakkale shipyard with a dry dock in September 2024, where the FPSO-to-FPU conversion is expected to take two years. The first year will involve modifications at the Çanakkale shipyard, and the second year will focus on module installation, integration, and onshore commissioning at Filyos Port. The FPU is planned for departure in the second half of 2026 for hook-up and offshore commissioning at the Sakarya Gas Field.

Once topside equipment is installed and connected to the completed production system (SPS, SURF, and export pipeline), the FPU will be moored at its designated location and commence natural gas processing.

The mooring system comprises of 20 off mooring piles, chains, polyester ropes and connectors. The work to be completed is to pre-lay 20 mooring lines, tow to field the FPU and hook up 20-off mooring lines to FPU (5 mooring lines for each group) as shown in the below figure.

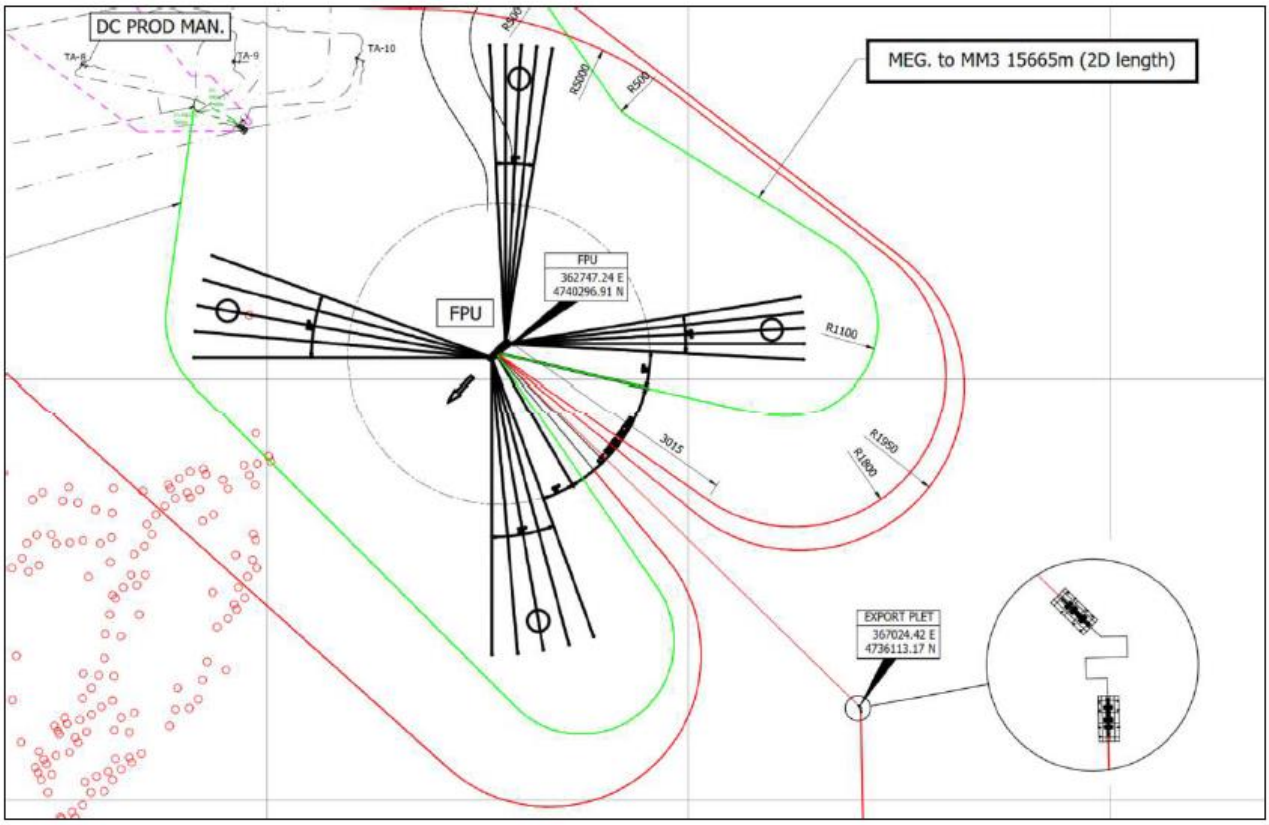

Figure 6: Mooring Field Layout

FPU is designed for autonomous operation at the Sakarya Gas Field, with a design life of 20 years. It will serve as a standalone offshore unit capable of gas processing and housing personnel, ensuring continuous operation without the need for external power or crew habitation facilities.

The living quarters on the FPU are designed to accommodate 140 personnel and will function as a Temporary Refuge (TR) to provide safe areas in the event of emergency. These quarters will include facilities for dry and

cold food storage sufficient for approximately 14 days, with normal supply vessel frequency expected to be at least once per week.

Utilities to support FPU operations will include systems for generating fresh water from seawater, handling grey and black water to meet MARPOL requirements, and storage facilities for consumables and chemicals. The FPU will have storage capacity for 14 days' worth of Marine Gas Oil (MGO), fresh water, and production chemicals, and 14 days' worth of MEG and MEG chemicals based on peak demand.

Logistical support for the FPU will be provided through platform supply vessels (PSVs) and helicopters, ensuring the continuous supply of goods, consumables, and personnel. PSVs will operate weekly, while helicopters will run three times per week. During offshore hook-up and maintenance shutdowns, the FPU will utilize its full 140-person capacity, necessitating more frequent helicopter and supply boat operations.

The representative layout of the FPU vessel is presented in Figure 7.

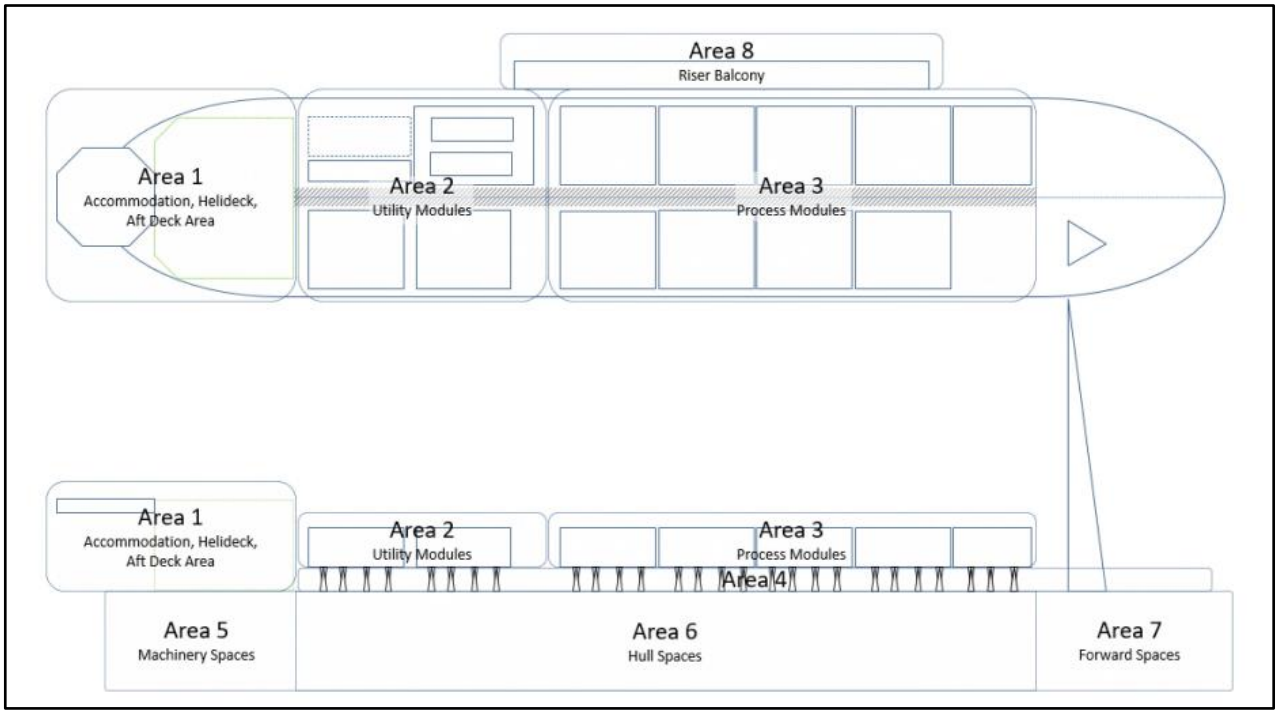

Figure 7: General Layout of FPU

Export Pipeline

To transport the processed natural gas meeting BOTAŞ sales specifications in the FPU to onshore, a new approximately 170 km long, 16-inch steel dry gas export offshore pipeline will be constructed and connected to the existing BOTAŞ grid for further distribution.

The dredging activity will stabilize the offshore pipeline by burying it in seabed sediment to protect it from ship anchors, abrasion, and fishing activities. It involves excavating a trench, placing the pipeline, and backfilling the trench with the removed sediment. The trenching will be done using a backhoe excavator on a barge, with a 500-meter safety zone for vessels involved in the work.

The dredged material will be temporarily stored near the Port area used during Phase 1 construction phase, covering 260,000 m² with water depth ranging from 5 to 11 meters. Excavating the coastal trenches will take about 75 days, pipe laying is expected to take 14 days, and backfilling the trench will take around 167 days. Including weather delays, the total schedule for dredging activities (including pipe laying and backfilling) is 303 days. The Dredging Environmental Management Plan has been prepared and the work will commence once all necessary permits are obtained. Once the concrete-coated pipeline is laid, it will be covered with at least 2 meters of sediment.

The cofferdam (Figure 8) will be used to reduce the risk of sediment flow from Filyos River into the trench. Causeways will be built by raising protective barriers (tubular piles) against the waves on both sides of the ditch made of stones and rocks imported to the site from outside to protect the ditch that has been dug on near shore of coastal crossing by using an open excavation technique (with or without cofferdam, in either case) from sea movements.

Figure 8: A Typical Cofferdam

Pipe joints are welded on a pipelay barge anchored offshore. An onshore winch pulls the pipe string toward the shore using a steel wire as new joints are added on the barge. The first joint has a pulling head attached to the winch line onshore. Once the first weld reaches the onshore tie-in point, the barge moves further offshore, continuing to weld new joints. Each weld is inspected visually and tested using Automatic Ultrasonic Testing.

The backfilling process will be done in two stages, similar to dredging works. First, dredged material stocked in the sea will be loaded into barges. The Cofferdam will be partially removed once the backfilling inside is properly completed and inspected. If a section of the Cofferdam meets the backfilling requirements, the supporting piles (tubular or sheet piles) will be removed, while the remaining section of the Cofferdam continues to be backfilled.

After the dredged material is loaded, the bulk vessels will pass through the trench as shown in Figure 9.

If the excavated sediment stored is insufficient, stability studies will be carried out by importing stones from appropriate quarries. Furthermore, upon assessing the risks of interaction with third parties, the material supplied by the licensed quarries may be utilised to close the ditch or the pipeline sections that remain outside the ditches. To this end, the “Technical Principles of Planning and Design of Coastal Structures” published by

the General Directorate of Infrastructure Investments will be followed in selecting the stones to be utilised as the filler.

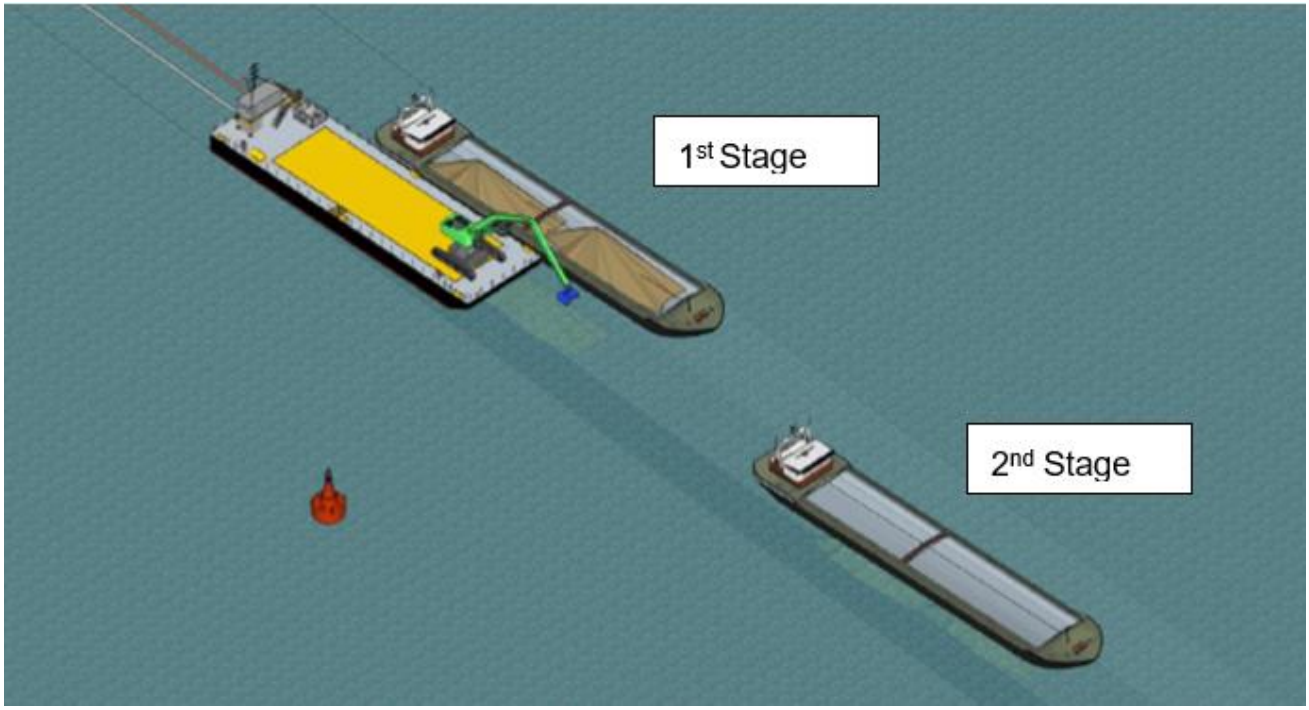

Figure 9: Backfill Process

The materials are anticipated to be transported from the Filyos Port to the construction site of the coastal Crossing Section by barges or by trucks. The quarry to use (if necessary) is close to the site.

Security zones of 500 m of either side of the offshore export pipeline and vessels will be setup and NAVTEX announcements will be made. Also, 10 m buffer zone onshore around constructions will be set to prevent unauthorized access.

In the event that the excavated excess sediment that may be generated due to any reason during the construction/installation of pipelines will be dumped into an existing nearby dumping site or another location on the seabed designated by the Republic of Türkiye Ministry of Environment, Urbanization and Climate Change, the requirements of the “Regulation on the Environmental Management of the Dredged Material” will be met upon request by the Ministry.

The pipeline will be transported by an offshore piping barge after being temporarily positioned by a shallow water piping barge. Temporary piping heads will be removed on the barge, and once welding and coating are finished, the piping process will continue. The barge will use a dynamic positioning system to maintain its position while conducting piping activities alongside welding and coating.

A remotely operated vehicle (ROV) will monitor the pipeline's placement on the seabed to ensure it stays within the designated construction corridor. Various parameters will be checked during the piping process. After the piping work is complete, a pipeline termination unit will be connected to the end of the pipe, linking it to the subsea production system.

To protect the pipeline from potential damage caused by fishing or anchoring, two methods will be used: digging under the pipeline to bury it or covering it with gravel. If there are any gaps under the pipeline because the seabed is roughness, these gaps will be filled or supported to ensure the pipeline stays safe long-term. The specific methods will be decided after surveys and design work are completed.. The work involves the use of deep water pipelay barge, pipe supply vessel, cargo barges, crew boats.

To protect the pipeline from rust, it will be coated with a special three-layer material, and additional protections like sacrificial anodes will be used where needed. The pipeline will also have a corrosion allowance built in, and a corrosion inhibitor will be injected during operation.

Before the pipeline is being operated, it will undergo a series of tests to make sure it's working correctly and is safe. This includes filling the pipeline with filtered seawater, cleaning it, and pressure testing it to check for any issues. Once installed, the pipeline will be checked to make sure it's in good condition and that no part is missing or damaged. Embedded parts will be detected using a magnet, and the rest will be inspected visually.

Infield pipelines (those connecting structures to the main platform) will be installed in two stages, and also undergo testing to ensure they're structurally sound and free of any contaminants. The seawater used for these pipelines will be taken from different sources depending on the location.

The pipeline will connect to the existing BOTAŞ tie-in point within the OPF boundaries.

2.3 Associated Facilities

According to the IFC Performance Standards, Associated Facilities are defined as:

IFC – PS1 par. 8 – "Associated facilities, which are facilities that are not funded as part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable"

Following the processing at the FPU, the gas produced at the Sakarya Gas Field will arrive onshore via the export gas pipeline to the existing BOTAŞ tie-in point. The tie-in point is connected to the Fiscal Metering Station (FMS), where the gas will be measured and offloaded to the national grid via the ~175 km onshore pipeline, i.e. the Western Black Sea Phase-2 Pipeline, built and operated by BOTAŞ. According to the IFC definitions the pipeline is considered as Associated Facility to the main Project.

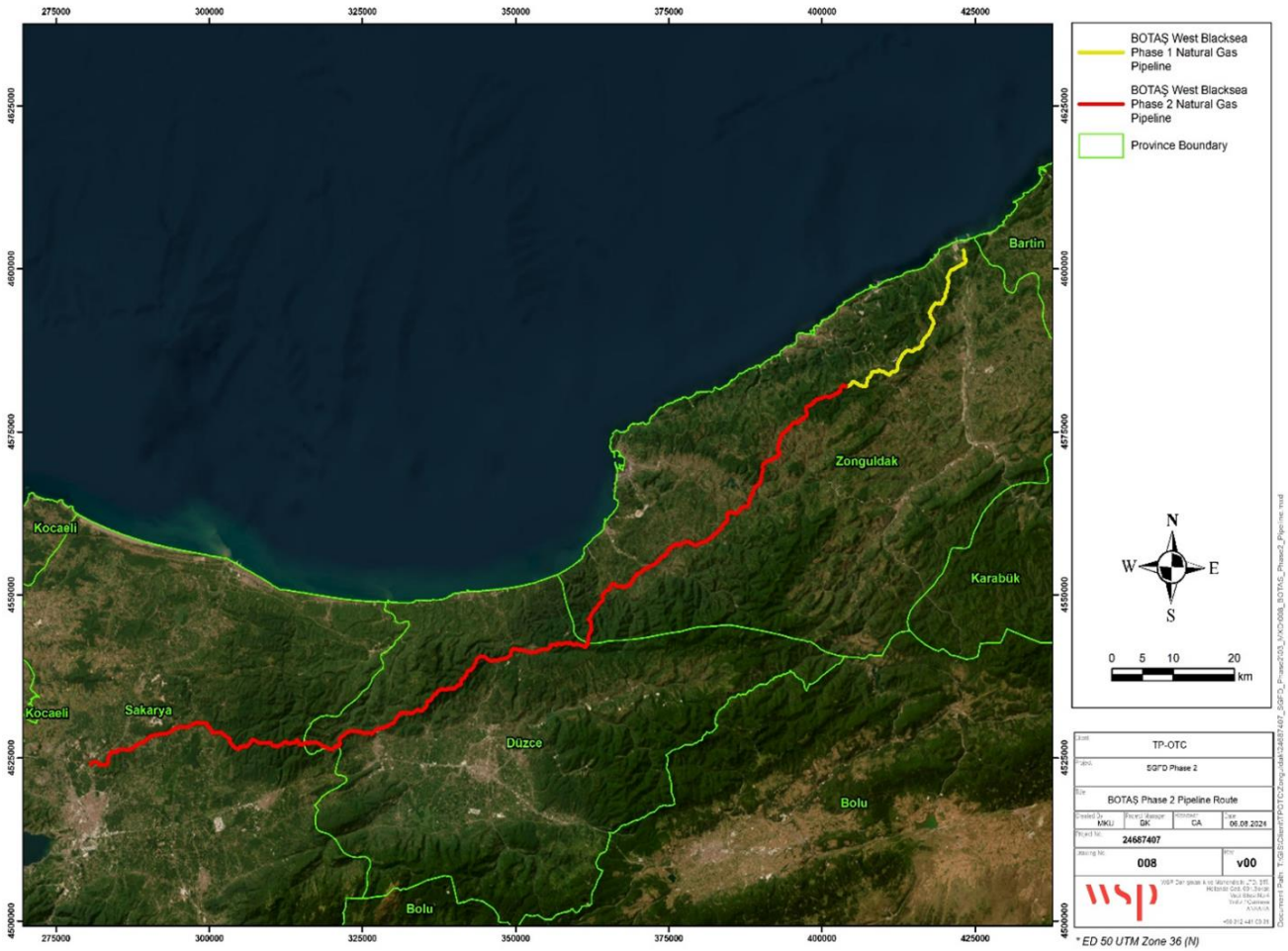

Figure 10: BOTAŞ - Western Black Sea Phase 1 and 2 Natural Gas Pipelines

The Western Black Sea Phase-2 Pipeline has been evaluated through a high-level E&S Assessment Report to identify key environmental and social risks and a Management and Corrective Action Plan with a list of site-specific mitigations measures focused on the construction phase of the pipeline has been developed. The document addresses the gaps identified and/or indicates if additional specific actions/documents are needed to ensure alignment between the two projects' components and the relevant Applicable Environmental and Social Requirements of the Project. The E&S Assessment Report is included as an appendix to the ESIA.

2.4 Project Schedule

Phase 2 construction works will include the construction of the export pipeline within approximately 12 months, followed by the construction of the SPS, SURF, FPU integration, and pre-commissioning works, which will also take approximately 12 months. These activities will occur in different periods and will not be simultaneous. According to the schedule:

- The construction of the export pipeline and the SPS is expected to be completed in 2025.
- The FPU vessel is anticipated to arrive at the Sakarya Gas Field, with connections to the SURF and SPS expected to be completed in early 2026.

- The connection of the processed gas to the BOTAŞ grid is targeted for July 2026.

2.5 Workforce Requirements

Onshore Workforce: Approximately 515 personnel will participate in onshore construction, with 24 staff dedicated to onshore operations for the FPU.

Vessel Crew: Vessel capacity will reach a maximum of 2,818 crew during construction. For operations, PSVs and maintenance vessels will operate with an 18-person crew, three times a week.

FPU Workforce: During FPU reactivation at Filyos Port, 1,980 workers are expected for installation. In the operational phase, 156 personnel will work, with 132 offshore on the FPU and 24 as additional onshore staff.

Accommodation: During construction, workers will be housed in existing camps from Phase 1. The FPU's operational phase will have accommodation capacity for 140 personnel, with 132 expected on board.

2.6 Alternatives Analysis

The methodological approach for the selection of the best-case design included the consideration of alternative in terms of:

- Site Alternatives
- Design Alternatives
- No Project Alternative

2.6.1 Alternative Locations of Project Components

IFC PS1 requires full and detailed justification for any proposed alternatives through the environmental and social risks and impacts identification and assessment process. In the following paragraphs, alternative locations considered for the export pipeline, FPU and the reasons that led to the choice of the designated locations over others are discussed.

Export Pipeline

The SGFD Phase 2 Project involves the construction of an offshore export pipeline to transport the processed natural gas from the Floating Production Unit (FPU) to onshore facilities. The Offshore Pipeline Routing Selection Report, prepared by SIA and Saipem on June 3, 2024. Two main route alternatives, Route Alternative 1 (RA-1) and Route Alternative 2 (RA-2), have been assessed for the escarpment and shallower sections of the Black sea. The locations of the route alternatives, RA-1 and RA-2 are shown in Figure 11.

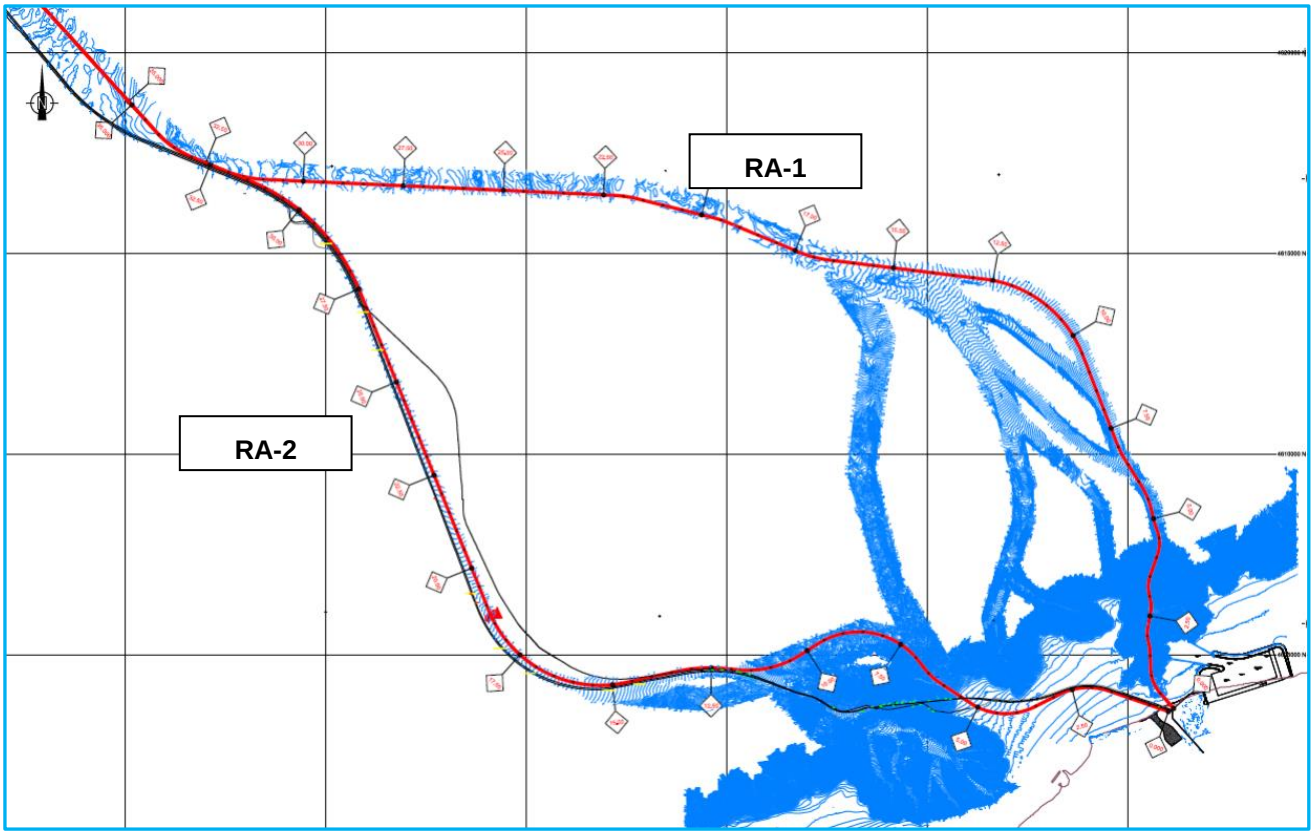

Figure 11: Locations of Route Alternatives (RA-1 and RA-2) for the Export Pipeline

Geohazard risks, interface with Filyos River, interface with Filyos Port, shore approach and shallow water constructability, concrete and burial requirements, curve stability, free span correction, crossings and onshore section are the key considerations for selecting the export pipeline.

Main outcomes obtained from the assessments made:

- Routes have similar issues in terms of geohazards.
- Rock dumping pre and post lay are required on both routes.
- Excavation pre and post lay are required on both routes.
- RA-2 does not require lateral counteract but requires crossing preparation.
- RA-1 has more uncertainties on rock volumes due to stiff seabed and berm lateral slopes.
- RA-2 is considered favorable with respect to interaction with Filyos port and ship traffic, with no mitigation required.
- RA-2 has risks for interface with river.
- RA-2 has an additional shallow water scope not required on RA-1.

While RA-2 presents challenges related to river crossings and additional shallow water scope, these issues can be effectively addressed through careful planning, environmental safeguards, and community engagement. The

route's favorable interaction with Filyos Port and ship traffic, combined with its lower uncertainties in rock volumes and geohazard management, offers a more stable foundation for environmental protection and resources management and minimizes social impacts. Therefore, RA-2 is the preferable option for the SGFD Phase 2 export pipeline.

Floating Production Unit

The position of the Floating Production Unit (FPU) has been selected within the Sakarya Gas Field, as illustrated in Figure 12.

In evaluating options for gas processing in Phase 2 of the SGFD, the decision was made to utilize an FPU, rather than expanding the capacity of the existing OPF constructed in Phase 1. While the OPF at Filyos base has sufficient space to expand and process the additional gas, the FPU approach reduces back-pressure and enhances reservoir recovery.

The choice of the FPU is primarily driven by its ability to enhance production efficiency and recovery rates. One of the significant advantages of the FPU is its capability to reduce downhole abandonment pressures to lower levels. FPU contributes to a higher gas recovery factor in the field, maximizing the extraction of hydrocarbons and optimizing overall field production.

An essential operational benefit of the FPU is its ability to separate water on-site. This feature eliminates the need to pump produced water 170 kilometers to shore, significantly reducing logistical challenges and operational costs. Additionally, the FPU reduces the length of the MEG and umbilical lines needed, further minimizing construction and maintenance requirements. This not only reduces logistical and operational costs but also mitigates environmental impacts associated with long-distance water transport. Shorter pipelines also decrease the energy consumption associated with pumping, leading to lower greenhouse gas (GHG) emissions during operations. By processing the gas offshore, the Project avoids the environmental risks linked to extensive pipeline networks and reduces the likelihood of spills or leaks that can occur during transportation. Furthermore, the reduction in infrastructure needs not only minimizes physical disturbances to marine and coastal ecosystems but also aligns with sustainability goals by lowering overall emissions associated with construction and operation.

The FPU's proximity to existing Phase 1 subsea infrastructure is another critical consideration. This close location reduces future complexities related to integrating Phase 1 wells with the Phase 2 infrastructure and the FPU, streamlining operations and minimizing the need for additional installations.

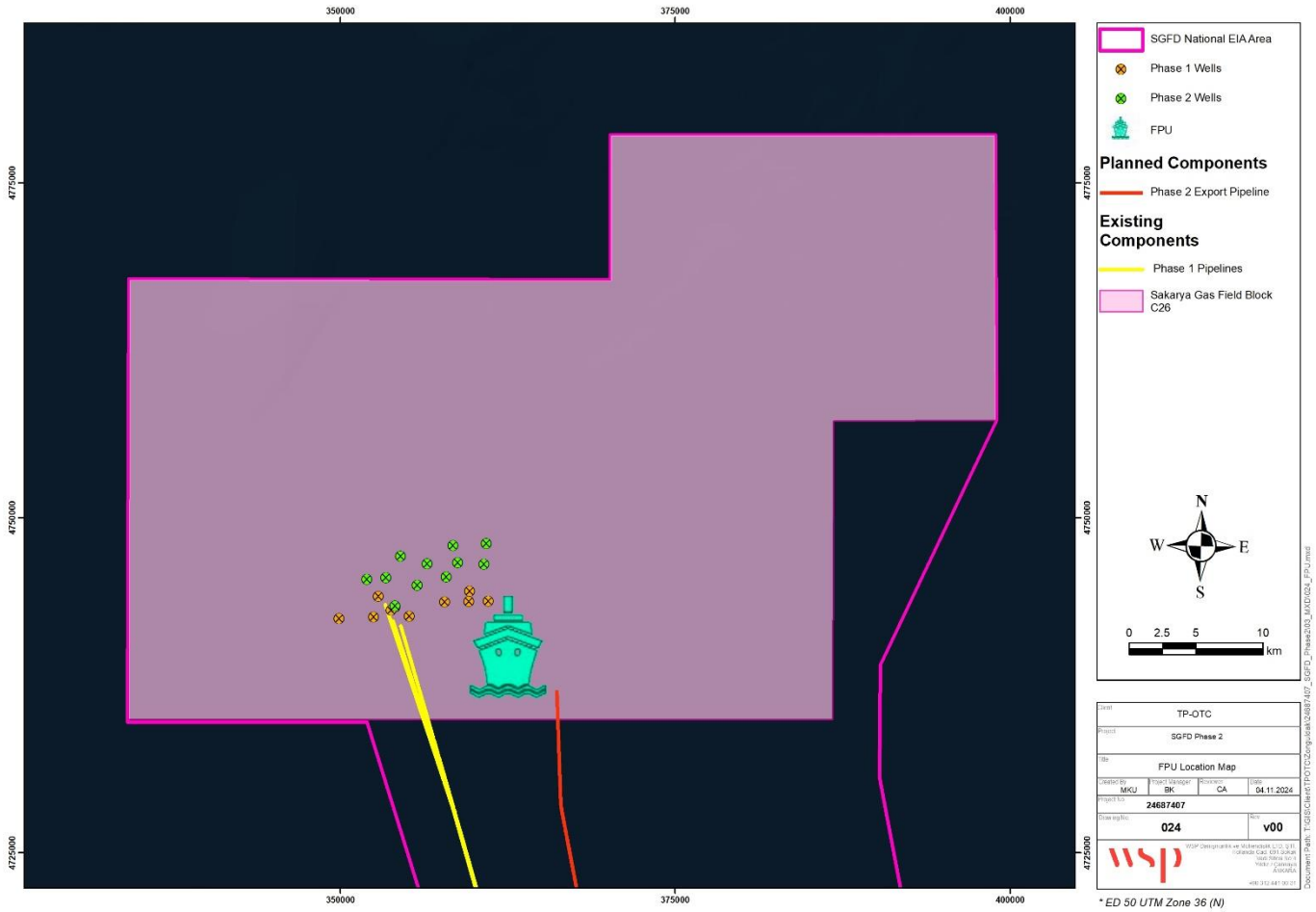

Figure 12: Selected Location of FPU

Onshore facilities

The site alternatives for the onshore facilities were assessed in the SGFD Phase 1 ESIA, which concluded that the Filyos site was optimal due to its proximity to the Sakarya Gas Field, logistical advantages, minimal environmental impact, and reduced construction and operational costs. Since the onshore facilities are already constructed and operational, further assessment of site alternatives for the onshore facilities in this Phase 2 ESIA Report was not deemed necessary.

2.6.2 Alternative Technologies Selection Process

The alternative technologies selection process has been carried out for several technologies concerning the FPU, the flares, the power generation, the disposal of hydrotest water, the heating medium, cooling system and the technical operations for the pipeline construction.

For the **flares** on the FPU, no continuous production flaring has been adopted as part of the development and flaring will be in place for emergency, safety and operational upsets only. The flare location in FPU is upwind of process units and has been selected considering local meteorological conditions and thermal radiation footprints based on the release rates, composition, tip types, etc. This approach follows the industry good engineering practice for facility siting and layout and reduces the potential risks to As-Low-As-Reasonably-Practicable (ALARP) levels. Although there are several technology alternatives for the flare system, demountable vertical flare system was selected for some advantages like space efficiency, less interaction with process units, dual low-pressure (LP) and high-pressure (HP) systems, enhanced safety and operational ease and maintenance. Flare Gas Recovery (FGR) was not chosen due to the intermittent nature of the flare.

For the **power generation**, the FPU will primarily use natural gas extracted from the field. This gas will fuel a high-pressure system connected to a steam boiler, which generates steam to drive a turbine generator for the FPU's operations. Emergency diesel generators will serve as backup to ensure a continuous power supply. Using natural gas eliminates the need for transporting additional fuels, reducing operational costs and logistical challenges associated with diesel, such as storage and spill risks. Additionally, natural gas combustion produces lower emissions, aligning with sustainability goals and regulatory requirements. The steam boiler and turbine generator system enhance efficiency by optimizing energy use and improving thermal efficiency. This setup is ideal for continuous operations, providing stable power with fewer mechanical issues and utilizing waste heat recovery to further reduce fuel consumption and environmental impact.

Disposal of Hydrotest Water

Pre-commissioning activities of the SPS, SURF and export pipeline involves flooding, cleaning, gauging and hydrotesting activities with filtered seawater with the addition of corrosion inhibitors, oxygen scavengers, biocides, dyes and MEG to verify equipment and pipeline integrity. Chemical additives (RX 5255 and RX 5102 D) were selected for their sustainability (no bioaccumulation, high level of dilution) and effectiveness (2-3 years long term preservation). Chemicals are ranked as gold (least hazardous) according to Cefas (The Centre for Environment, Fisheries and Aquaculture Science, UK) ranking based on the physical, chemical and ecotoxicological properties of products. Discharge of the used hydrotest water to deep sea at water depth of 2,200 m was planned since injection into a disposal well option is not available due to the same reasons explained in the above sub-section.

For the pre-commissioning activities of onshore section of the export pipeline potable water will be used and chemical additives will not be included. Therefore, it was decided on discharging resulting wastewater to Filyos

river in case discharge standards are complied. If the discharge does not comply with the standards, the option of transporting it to licensed wastewater treatment plants (WWTPs) with vacuum trucks is also being considered.

For the **heating medium**, steam has been selected as the preferred heating medium on the FPU due to its favorable economic, environmental, and safety performance.

For the **cooling system,** seawater has been selected as the primary source for cooling the cooling medium on the FPU. Seawater will be drawn from the surrounding environment and used to regulate the temperature of the cooling medium, which will then be circulated throughout the FPU's process units. This closed-circuit system ensures efficient heat exchange while minimizing environmental impact by keeping the seawater and process fluids separate.

Lastly, for **technical options for the pipeline construction,** for the Phase 2 pipeline construction, the trenching method, which was successfully employed in Phase 1, will again be utilized. This approach involves trenching the pipeline route, including specific sections that require crossings under roads and other infrastructure. As in Phase 1, the pipeline will be routed through conduits and culverts where necessary, ensuring minimal disruption to existing infrastructure such as roads and railways.

GHG emissions

This Alternatives Analysis follows the guidance of the Equator Principle 4 (EP4), which requires an account of the considerations the Project has taken to attain the best practicable environmental options to mitigate its contribution to climate change through reduction on GHG emissions. Notably, EP4 describes the oil and gas sector, which the Project falls within, as a 'high carbon intensity' sector. In accordance with EP4s guidance, the Project is required to consider alternative fuel or energy sources and viable technology that is used in the same industry or region with energy efficiency and GHG efficiency of the various technologies.

The Scope 1 emissions of the Project during the operation phase, which are from stationary combustion, mobile combustion (from offshore transportation), and fugitive emissions have been calculated. The alternative analysis was discussed in terms of GHG reductions, other environmental benefits, and feasibility of each alternative option, for the Project sources with highest estimated emissions:

- Upset and maintenance emissions
- Power generation
- Process emissions
- Emergency equipment
- Offshore support vessel operations

2.6.3 No Project

The 'No Project' alternative is the situation where the Project, does not proceed. Under this scenario, there would not be any impacts on the environment, and the beneficial socio-economic outcomes of the Project would not happen. However, the need for the Project is driven by Türkiye's rapidly increasing natural gas demand and shortages due to political and technical reasons. If the Project does not proceed, the goal of reducing dependency on imports of natural gas and meeting the increasing demand without any shortages accordingly would not be realized. Consequently, the economic benefit to local and national stakeholders, as well as the energy security it would bring, would not be realised. On this basis, the 'No Project' option was rejected.

3.0 IMPACT ASSESSMENT SUMMARY

In order to assess the environmental and social impacts of the Project, an Environmental and Social Impact Assessment Report has been prepared with the following objectives:

- Identification and assessment of environmental and social impacts, both adverse and beneficial, in the Project's area of influence,
- Evaluation of the main environmental and social risks and potential impacts of the Project,
- Identification of the management, mitigation, monitoring and compensation measures,
- Presentation of Environmental and Social Management Plan (ESMP), updates to existing Environmental and Social Management System (ESMS) and the Stakeholder Engagement documentation, and grievance mechanism (GM) in line with the Equator Principles (EP) 4 and IFC Performance Standards (PSs),
- Cumulative impact assessment (CIA) (as required by the EP 4 and IFC PSs),
- Assessment of associated facilities.

As a key step in the ESIA process; various studies have been conducted to collect information on the existing environmental and social baseline conditions. Apart from the desktop and relevant literature review, the results of the ongoing environmental and social monitoring since Phase 1 were utilized. New baseline data were also collected for some components.

The outcomes of the Sakarya Gas Field Development Project Phase 2 ESIA and the main impacts on the offshore environment and onshore environment and local communities are summarized in the following sections. Mitigation measures and management plans addressing negative impacts are also presented to show how TP-OTC will be managing and mitigating the identified impacts.

3.1 Air Emissions and Ambient Air Quality

Air quality impacts from offshore Project components

The main offshore sources of emissions during the construction stage of the Project are associated with exhaust emissions from vessels at the various construction phases, including offshore excavation and offshore pipeline laying processes. During the operation, emission sources will be maintenance vessels, Platform Supply Vessels (PSV) and the FPU. Impacts on air quality were assessed in the ESIA, mitigation measures and monitoring requirements were identified.

Key mitigation measures include the application of air quality management procedures, detailed in the Pollution Prevention Plan, such as:

- All atmospheric emissions associated with the Project will meet regulatory source emission standards.
- The sulphur content of fuel used by Project vessels will comply with Regulation 14 of MARPOL Annex VI (as appropriate to vessel class), limiting sulphur content to 0.50% m/m to control SOx and particulate matter emissions.
- The FPU facility's design will aim to reduce atmospheric and GHG emissions through energy-efficient systems.

- Fuel gas will be the preferred fuel for FPU operations, reducing reliance on diesel or marine gas oil.
- Heat recovery will be utilized for the Gas Turbine (GT) Compressor driver through a Waste Heat Recovery Unit (WHRU) in order to ensure efficient use of resources and reduce air emissions and GHG footprint.
- Continuous venting is prohibited; flaring and fugitive emissions will be minimized.
- To control fugitive emissions:
  - Isolation methods will be implemented to limit atmospheric leaks from equipment.
  - Leak Detection and Repair (LDAR) programs will be implemented to monitor and repair leaks in hydrocarbon handling equipment.
- FPU combustion emissions will adhere to MARPOL Annex VI standards for NOx, SOx, and particulate matter.
- Shore-based power for vessels will be used where applicable, including port tugs, during idling periods when available, to reduce emissions from onboard power generation.
- For onshore and offshore exhaust emission reduction for vessels and FPU:
  - Best available control technology will be adopted to reduce emissions from fuel oil storage and engines.
  - Vehicle, vessel and machinery exhaust systems will be ensured to comply with exhaust emission limits per relevant legislation and maintain them according to manufacturer recommendations.
- Flaring emissions mitigation in FPU operation:
  - Flares with multiple tips will be designed for smokeless burning under all conditions and be ensured to control odour and visible smoke emissions.
  - Flaring will be minimized by implementing flare gas recovery units, soft seat valve technology, and conservation pilots where feasible.
  - Flaring volumes will be controlled with fixed targets, ensuring efficient flare gas use.
- Installation of fire-fighting or refrigeration systems containing CFCs will be avoided, in accordance with phase-out requirements.
- ODS during maintenance activities will be recovered, preventing venting to the atmosphere.

Air quality impacts from onshore Project components

The primary sources of air pollution during the onshore construction phase of the Project include dust emissions from ground excavation, cut-and-fill operations, and construction of the onshore section of the Phase-2 export pipeline, as well as exhaust emissions from vehicles and construction machinery. Dust emissions at the landfall area were below the 1 kg/hour threshold set by Turkish regulations, so an air emission dispersion model was not required. Similarly, emissions from construction machinery for each pollutant were compared against regulatory thresholds and found to be below the limits, making air dispersion modelling unnecessary. Air quality impacts were assessed in the ESIA, with mitigation measures and monitoring requirements identified.

To minimize air emissions during onshore construction, several dust and exhaust emission controls will be implemented. For dust emissions, construction activities and stockpiles will be placed away from sensitive receptors, materials will be moistened to reduce windblown dust, and stockpiles will be kept for the shortest duration possible. Work will be slowed or stopped during high winds, completed earthworks will be sealed or re-vegetated promptly, vehicles carrying loose materials will be covered, and speed limits will be enforced to reduce vehicle dust. Water suppression will also be used on road surfaces.

For exhaust emissions, machinery will only be kept running when necessary, and all equipment will undergo regular maintenance to ensure compliance with environmental standards. Construction activities will be streamlined to use the minimum number of vehicles and machinery, and electric tools will be used when feasible.

For Phase-2 operations, no new air-emitting components will be added to onshore apart from the OPF facilities included in Phase-1. The air quality impacts of OPF operations were assessed in the Phase-1 ESIA (disclosed in 2022), and periodic air quality monitoring has shown that emissions consistently meet IFC and Turkish regulatory standards. The additional Phase-2 onshore emissions will include only fugitive VOCs from connection equipment (valves, flanges, seals), which is below the regulatory threshold limit for air emission dispersion modelling. Thus, Phase-2 operations are expected to have no additional air impacts beyond those already assessed.

The following design measures have been considered for the reduction of potential atmospheric leaks from components and instruments, and releases to atmosphere from vessels (close to shore) and inspection points during maintenance:

- Valves and Fittings: Flanged manual valves with integral flanges, swing check valves with limit stops, and globe-type bypass valves are used. Pipeline fittings are seamless unless specified otherwise, and all control valves undergo ISO 15848 (2015) fugitive testing.
- Leak Limits and Testing: A permissible leak limit of 100 ppm at stem package flanges is set, and welds are fully inspected.
- Isolation Methods: Different isolation valves and configurations (Single Block and Bleed, Double Block and Bleed, spectacle blinds, line blinds, and spades) are used to control flow and minimize leaks, especially for hydrocarbon handling equipment.
- Drain Isolation: Hazardous closed drains use a manual isolation valve and ball valve arrangement, while non-hazardous open drains connect to the common drain header.
- Tank/Vessel Isolation: Positive isolation of vessels for maintenance is achieved by valve isolation, spectacle blinds, or removable nozzles. Pig receivers use DBB isolation with purge connections.
- Piping Design: Protective coating, limited use of flanges, and elimination of threaded connections minimize the risk of leaks.
- Leak Detection and Repair (LDAR): LDAR programs are part of the management system for monitoring and repairing leaks.

Periodical ambient air quality monitoring at the sensitive receptors will continue as defined in the disclosed ESIA of the Phase-1.

3.2 Greenhouse Gas Emissions

The Project's annual GHG emissions for construction and operation are preliminary estimates based on design data and construction plans, and may vary significantly from actual emissions. Final GHG emissions will be recalculated in annual basis when actual consumption and design parameters are available.

The combined annual emissions from the construction phase of the Project are about 264,892.1 t CO_2e per annum. This annual value surpasses the 25,000 t CO_2e threshold defined in IFC PS3 and Equator Principles IV. Therefore, technically feasible and cost-effective mitigation options will be considered for marine vessels operation.

The Project's operational phase generates a total of 371,009.5 t (371 kt) of CO_2e per annum, above the 100 kt CO_2e annually. EP4 requires projects with emissions above 100 kt CO_2e annually to conduct an alternatives assessment to identify the best practicable environmental options and consideration of alternative fuel or energy sources that were considered for the project. As stated in previous section of this NTS, the Project alternatives analysis and equipment selection process considered the aspect of GHG emissions to ensure these are minimised.

Resource efficiency and emissions will be managed through the updated Resource Efficiency and Pollution Prevention Plans. Although the Project's contribution to national and global GHG emissions is minimal, construction-phase and operation-phase emissions exceed the threshold set by IFC PS3 and Equator Principles IV, requiring annual public reporting.

To further reduce GHG emissions and enhance resource efficiency, the following measures will be implemented where possible:

- Integrate Best Available Techniques (BATs) per European guidelines in Project design.
- Provide training on climate, resource, and energy efficiency for all employees.
- Select fuel-efficient equipment and ensure regular maintenance.
- Update the Resource Efficiency and Pollution Prevention Plan to minimize emissions.
- Restrict idling and non-essential equipment operation.
- Consider and adopt renewable energy resources where applicable in FPU and OPF sites.
- Reduce Scope 2 GHG emissions by using renewable energy especially for during construction phase. Obtain a Green Energy Certificate.

3.3 Climate Change Risk Assessment

As a part of this ESIA, a Climate Change Risk Assessment has been prepared in line with the Equator Principles 4. The Climate Change Risk Assessment approach is designed to be consistent with the approach of the Taskforce for Climate-related Financial Disclosure (TCFD) and considers physical climate change risks to the Project.

According to the qualitative physical risk assessment, the site has in-design adaptation measures in places to reduce the impact of both current climate and projected changes to the future climate. Through the qualitative risk assessment, it is identified that the components and the FPU are resilient as no unacceptable risks were

identified. The majority of the identified risks to the for impacts of climate change on are medium or lower. To better understand these risks and to identify any required adaptation measures, the TP-OTC could conduct a detailed, quantitative climate risk assessment in the future to further identify the impact of extreme weather events.

Although the mitigation measures have the potential to reduce climate risks, the measures need to be monitored for their performance through an ongoing monitoring and surveillance process. This continual improvement process could be used to outline the decision-making process for when action needs to be taken to improve climate resilience. The continual improvement process could be updated through an ongoing process over the lifetime of the Project. The results from the monitoring programs would be integrated to test the effectiveness of resilience and mitigation actions and manage the unexpected outcomes. The Project is considered to have no high significant Transition Risks. The Project is considered to have one moderate significant Opportunity relating to the continued/increased domestic demand for natural gas as a lower-carbon fuel.

In line with the Equator Principles IV, the Project was evaluated for compatibility with Türkiye's Nationally Determined Contribution (NDC) under its climate commitments. The assessment focused on whether domestic natural gas production could help Türkiye reach its climate goals by reducing reliance on higher-carbon fuels. Türkiye's NDC aims for a 42% reduction in GHG emissions growth by 2030 from the Business-as-Usual scenario, where emissions would otherwise grow by 75%. Under the Mitigation scenario, emissions are expected to increase by 55%. Although the NDC does not specifically mention natural gas, it presents an opportunity for relative GHG reductions by replacing higher-emission fuels like coal and oil.

3.4 Wastewater Discharges

Wastewater discharge from offshore Project components

Wastewater such as bilge water (leachate and oily wastewater), ballast water, domestic wastewater etc. is expected to be generated by the vessels, during construction and operation phases of the Project.

During construction and operation, domestic wastewater generated by the personnel working on the vessels will be taken by waste ships and transferred to onshore for disposal. Bilge water from machinery spaces in vessels will be shipped to Zonguldak TTK Waste Reception Facility for disposal and will not be discharged into sea. All ships exchanging ballast water will do the exchange at least 50 nautical miles (NM) from the nearest land and in waters at least 200 m in depth, in accordance with the Ballast Water Management Convention and Guidelines developed by International Maritime Organization (IMO).

Vessels will be in compliance with MARPOL, SOLAS and IMO requirements at all times.

For hydrotesting of the offshore section, the gas export pipeline and flowlines will be filled with seawater for hydrotesting. Approximately 42,523 m³ seawater will be used. Seawater will be supplied from an intake structure (water winning spread) that will be located at Filyos Port quayside. Resulting wastewater is planned to be discharged deep sea, in correspondence to the SPS site (i.e., at a depth of 2,200 m), meeting Project discharge standards identified in the ESIA. Chemical additives will be selected in terms of dose concentration, toxicity, biodegradability, bioavailability, and bioaccumulation potential and effluents to be compliant with the relevant Project Standards. Hydrotest water will be minimized and when feasible, same water will be used for multiple tests. Reducing the hydrotest duration will reduce the time water will remain in the pipeline and consequently reduce the need for chemicals.

During operation, wastewater generated on the FPU will consist of ship-based wastewater (such as bilge water, slop water and ballast water treated through an oil-water separator), domestic wastewater, produced water with monovalent salt, cooling seawater. These wastewaters will be managed in accordance with the discharge standards issued by the Ministry of Environment, Urbanization and Climate Change and MARPOL. Discharges will be carried out in accordance with the permit to be issued by MoEUCC (see ESIA Section 3.10).

Wastewater discharges will be compliant with a number of international standards and regulations, including:

- Bucharest Convention: Protocol on Protection of the Black Sea Marine Environment Against Pollution from Land-Based Sources: This protocol mandates that all necessary measures be taken to prevent, reduce, and control pollution from land-based sources, including offshore installations like FPU.

  Annex I Substances: The protocol lists specific substances that must be controlled or eliminated in discharges, such as heavy metals, persistent organic pollutants, and nutrients that can cause eutrophication.

  Monitoring and Reporting: Continuous monitoring of water quality and regular reporting are required to ensure compliance with environmental standards.

- MARPOL Convention: Annex I: This annex addresses the prevention of pollution by oil and other harmful substances. FPU must comply with these regulations, which include requirements for the treatment and discharge of oily water.

  Guidelines for FPU: The International Maritime Organization (IMO) provides specific guidelines for the application of MARPOL Annex I to FPU, ensuring uniform standards for the treatment and discharge of processed water.

Wastewater discharge from onshore Project components

Sources of wastewater to be produced during construction works at the onshore section of the Project are domestic wastewater due to personnel, wastewater generated by backwashing of filters in the potable water treatment plants and wastewater resulting from onshore pre-commissioning activities. During construction phase sewage, backwashing water and pre-commissioning water are planned to be discharged into Filyos River, through Phase 1's existing systems. There will not be any wastewater discharge on the onshore section due to the operation of Phase 2. The only wastewater generated due to the onshore operation of Phase 2 will be domestic wastewater generated due to personnel and will be discharged into Filyos River, through Phase 1's existing systems.

Some of the key mitigation measures to reduce the potential impacts of wastewater discharge are the following:

- The drainage system within the construction areas will be designed to collect the runoff water, discharge into the Filyos River, preventing off-site sediment transport.
- The wastewater from pre-commissioning will be discharged to Filyos River if the analyses results are compliant with the Project Standards.
- The hydrotesting lines shall be depressurized immediately.
- Project-specific Pollution Prevention Plan will be implemented for the management of hydrotest water, backwash wastewater, sewage wastewater, wastes and hazardous materials.

- All discharge points would utilize discharge dispersion methods to mitigate erosion.
- Where possible, water used in one section of the pipeline will be transferred to adjacent sections upon completion of the hydrostatic test section in order to minimize discharge volume.
- As elaborated in Phase 1 ESIA, the drainage system within the OPF has been designed to collect the runoff water and discharge it into Filyos River after proper outlet structures to prevent off-site sediment transport. The wastewaters from sanitary facilities and kitchens are not discharged into the open drain.
- To protect the environment from accidental contaminated water flowing into the river, manually operated sluice gate is provided before the outfall location of the ditch for examination of stormwater for any contamination.

3.5 Noise and Vibration

Emission of noise from offshore Project components

The emission of underwater noise is expected both during construction and operation phases of the Project. During construction phase, underwater noise will be mainly created by offshore excavation and sediment storage, pipelaying processes and working vessels' propellers.

During the operation phase, since the FPU will be moored in place, the emission of underwater noise will be primarily due to the periodic monitoring and maintenance activities of the offshore structures. Depending on the vessel used, an emission of 150-185 dB re 1 µPa at 1 m in the low frequency band (< 300 Hz) may be expected.

It must however be noted that these maintenance/repair operations are not performed continuously and do not require a large number of vessels and that noise emissions do not sum arithmetically, being on a logarithmical scale. In addition, all vessels will be compliant with MARPOL, to which Türkiye is signatory.

Compared to the sound generated by vessels, the underwater noise of pipelines being laid is reported to be negligible to unrecordable, and so may be dredging activities, whose emissions are in the low frequency band as well.

Cetaceans (which are the only marine mammals occurring in the area) highly rely on the acoustics, thus underwater noises have the potentiality to interfere with primary functions of such species, masking acoustic signals. However, this may happen only if the underwater noise is emitted in a frequency range that overlaps with the hearing and vocal abilities of the species. Nonetheless, low frequencies that characterize vessels' sound may only affect low frequency cetaceans (such as baleen whales) which are completely absent in the Black Sea. Taking into account these considerations, it can be stated that the noise produced during construction and operation phases is unlikely to seriously affect cetaceans.

Mitigation measures in order to control the level of noise produced will include:

- All vessels used to be compliant with MARPOL, to which Türkiye is signatory, whose regulations also have the objective of minimizing and preventing the noise pollution created by maritime traffic.
- Unnecessary anthropogenic noise that does not contribute to work activities should be avoided to minimize disturbance to marine mammals.
- Work activities will be planned to ensure that the noisiest tasks are, as much as possible, scheduled outside of dusk and dawn, when marine mammals are more active.

Emission of noise and vibration from onshore Project components

Potential onshore noise impacts may be associated both with the Project construction activities.

Construction noise is mainly associated with operation of construction vehicles & equipment and general construction works, which will be in a very limited area, within the SGFD boundaries, during installation of the onshore section of the export gas pipeline. For the assessment of the noise and vibration to be generated during the construction phase of the Project, a noise modelling study and a vibration assessment study have been conducted as part of the ESIA in order to determine the potential impacts at sensitive receptors. Operation of the vessels during excavation of the export gas pipeline trench in the shallow water (up to 2 km) has also been considered. According to the model results, noise levels at all receptors comply with the limit values set by the Turkish Regulation as well as IFC guideline values.

The vibration levels calculated at the sensitive receptors, for the construction phase, are also below the regulatory limits.

The noise and vibration impacts associated with the operation of the OPF were thoroughly assessed in the SGFD Phase 1 ESIA which was disclosed in 2022. As part of the Phase 1 commitments, TP-OTC has been conducting periodic noise measurements at the nearest sensitive receptors to monitor the noise impacts of the OPF operation. The noise levels measured during OPF operation have consistently met IFC guideline value and Turkish regulatory limit values. No additional noise or vibration impacts are expected during Phase 2 operation beyond those assessed in the SGFD Phase 1 ESIA. Consequently, no additional noise or vibration assessment for the operation phase was conducted in this ESIA Report.

The mitigation measure proposed are expected to decrease the noise emission at a low impact level. The key mitigation measures to be implemented are the following:

- Speed limit applications will be applied for the Project vehicles that will transport construction materials/equipment.
- Machinery, equipment and vehicles with lower sound power levels and sound reduced models will be preferred.
- Properly refurbished and/or new machinery, equipment and vehicles will be used to the extent possible.
- Maintenance of construction vehicles will be conducted regularly by means of a regular vehicle maintenance and repair program as per the recommendations of the manufacturer.
- Where applicable, silencers will be installed on the exhaust of vehicles.
- Portable barriers and acoustic enclosures will be put around equipment where necessary.
- In case of any grievance, temporary noise barriers will be deployed near sensitive receptors where practical.
- Natural topography will be used to create a barrier against noise where feasible.
- Construction traffic through the settlements will be avoided, whenever alternative routes and/or service roads are available.
- Idling of construction vehicles will be avoided.
- Night-time activities will be avoided where possible.

3.6 Waste Management

General non-hazardous and hazardous wastes generated due to construction activities are mainly, municipal waste, packaging waste, waste oil, contaminated packaging wastes, hydraulic fluids, used batteries, empty paint and chemical containers, filters, fluorescent tubes, scrap metals and cables, welding waste, end-of-life tires, electrical and electronic wastes, treatment sludge and medical waste.

Significant additional waste stream specific to vessel operations are residues/sludge from scrubbers (exhaust gas cleaning), scrubber systems washing water, incinerator ash (if any), sludge from engine rooms, fuel tanks and/or oil sediments of vessels. The wastes that fall under the scope of MARPOL 73/78 will be transported via support vessels to the TTK Zonguldak Port Waste Reception Facility. All other wastes will be sent to the onshore temporary storage area at Filyos Port before being transported to a licensed waste reception facility for disposal.

Wastes generated onshore will be stored at the temporary waste storage area and then disposed of by licensed companies. Any waste generation on onshore section due to operation of Phase 2 other than the ones defined in the Phase 1 ESIA is not expected.

Solid and liquid wastes to be generated at the FPU will include divalent salts & monovalent salts, domestic wastes, production chemical wastes, laboratory chemical wastes, process equipment lubricants, and medical wastes. The wastes generated from the FPU will be managed by separating at the source and transferring to shore via PSVs for temporary storage either in the established Hazardous and Non-hazardous waste Temporary Storage Area of the SGFD or Zonguldak TTK Waste Acceptance Facility.

Waste management practices will be employed during the construction and operation stages including implementation of the updated Waste Management Plan and Pollution Prevention Plan detailing the measures for the classification, labelling, storage and disposal of wastes to prevent soil, seawater and water contamination.

3.7 Biodiversity

Offshore biodiversity impacts

The baseline information collected and processed as part of the ESIA included the assessment and evaluation of biodiversity in the offshore Project Area of Influence, including plankton, benthic habitats, fishes and marine mammals. All these components are expected to be differently impacted by the Project offshore activities. During construction phase, several impact factors may act on marine components, such as the minor leakage of contaminants into water, the emission of particulates and chemicals, the discharge of wastewater and the emission of light originated by offshore excavation activities, offshore pipeline laying, wastewater treatment discharge and pipeline hydrotesting, cleaning and gauging.

Plankton, which comprehends all the organisms floating in seawater, is particularly abundant and diverse in the study area. It is expected to be impacted by the potential emission of contaminants and light expected during offshore excavation and pipeline laying activities that will take place during construction phase and pipeline testing. Several mitigation measures will be implemented to minimize the possible impacts on plankton, where the most important for all offshore biodiversity components being: all vessels will be compliant with IMO, SOLAS, and MARPOL regulations.

Regarding the emission of contaminants into marine water, pipeline testing fluids will be discharged following relevant standards. Furthermore, the same water will be used for multiple tests and the time that test water

remains in the equipment or pipeline will be reduced to minimize the need for chemicals. During the operation phase, discharge of wastewater and use of seawater are expected impact seawater quality, for which the mitigation measures developed for managing all wastewater discharges will be implemented.

For benthic communities, that is the flora and fauna related to the bottom of the sea, impacts are expected during construction phase due to offshore excavation and pipeline laying operations. Resuspension of sediments could directly affect the mortality to benthic organisms creating a chocking effect on the bottom. The pipeline laying could cause limited habitat disruption, through fragmentation of soft bottom habitats. Finally, water discharge could lead to chemical imbalances thus altering the benthic community. To minimize the impacts produced by such actions, various mitigation measures will be implemented: excavated sediments will be gently placed in mapped section of a temporary storage area in order to reduce the resuspension and to ensure that the original sediment type is not destroyed during backfilling operations. The implementation of the abovementioned mitigation should allow a low impact on benthic component. In contrast, during operation phase benthic communities will likely experience a positive impact due to the presence of new offshore infrastructures, potentially forming biodiversity oases that may attract different species by providing a shelter for benthic organisms.

Fishes may be impacted by offshore excavation activities, pipeline laying and pre-commissioning activities (e.g., pipeline hydrotesting, cleaning and gauging) that could lead to minor leakages of contaminants into water, emission of underwater noise, handling of and resuspension of sediments and emission of light. Key mitigation measures include the compliance of the vessels with MARPOL and the use of recent and well-maintained propellers, in order to mitigate the impacts of both the emission of underwater noise and of contaminants. Regarding the emission of contaminants into marine water, fluids used for pipeline testing will be discharged following relevant standards, the same water will be used for multiple tests and the need for chemicals will be reduced by minimizing the time that water remains in the pipelines. Additionally, chemicals will be carefully selected based on their lower toxicity, higher biodegradability and lower bioaccumulation potential. No mitigation measures are required for the emission of light. During operation phase, fishes could be impacted by the Minor leakage of contaminants into water, emission of underwater noise, emission of electromagnetic fields (EMF), discharge of produced water and discharge of wastewater. Implementation of the mitigation measures should allow a low impact on fish component. Fish communities will likely experience a positive impact due to the presence of new offshore infrastructures, since they may attract different species by providing a shelter for benthic organisms that may settle there, and therefore the fish community associated (more opportunities for predation, foraging, hiding, refuging, mating, etc.).

Marine mammals and critical habitats (specific areas that contain physical or biological features essential to conservation of certain species) are expected to be mostly impacted by the emission of underwater noise and the presence of moving vessels during construction phase. Low-frequency noise originated by working vessel propellers could potentially interfere with acoustic signalling. However, such low frequency activities are unlikely to impact the species present in the Black Sea given the non-overlap of frequencies generated by vessels and the ones cetaceans living in the area use. Regarding the presence of moving vessels, although collisions between vessels and large sized species are frequently observed, no large cetacean species occurs in the Black Sea. The compliance of the vessels with MARPOL standards and the definition and implementation of dedicated routes and speed limits should be sufficient to reach an overall low impact. During operation phase, emission of electromagnetic fields could also act as an impact factor, however the relationship between cetaceans' behaviour and electromagnetic fields is still poorly studied. Therefore adopting a strong precautionary approach, the emission of EMFs is considered to potentially affect marine mammals in the AoI,

even if limitedly. Additionally, it is expected that the original conditions will recover rather quickly once the umbilical line ceases operation.

Onshore biodiversity impacts

Onshore biodiversity impacts were assessed taking into account several biological components, such as flora, freshwater fauna, terrestrial fauna, birds, habitats and legally and internationally protected areas.

Onshore impacts on flora are in a very limited area, where the onshore section of the export gas pipeline will be laid, between the shoreline and the OPF. Flora could be potentially impacted by site levelling and material transportation, that could lead to removal of soil and to the emission of dust and particulate matters. The Project footprint is entirely in a modified habitat. 20% of AoI is natural habitat and these areas will not be directly impacted by construction activities.

Emission of dust and particulate matter generated by topsoil removal could negatively impact flora. Removal of soil could facilitate the introduction and proliferation of alien flora species carried by vehicles, machinery and materials utilized in other sites and entering the construction area. For the possible introduction of alien species, all vehicles and machinery will be checked for evident foreign plant material, soil and seeds. Vehicles covered with visible amounts of dirt will be washed in a controlled site. If spreading of invasive species is observed, an appropriate eradication program will be developed and implemented. .

Regarding the freshwater fauna there will be no construction works directly in freshwater habitat. However activities such as site levelling, material transportation and general construction works are expected to generate several impacts that could act negatively. Discharges of wastewater, emission of dust and particulate matter and noise and vibrations are all expected to have negligible impacts on the freshwater fauna component, however, key mitigation measures have been developed:

- For discharges of wastewater mitigation will be implemented as in section 3.4.
- For construction phase, emissions of noise and vibrations mitigation will be implemented as in section 3.5.
- For construction phase, emissions of dust and particulate matter mitigation will be implemented as in section 3.1.
- For changes in flow/circulation in natural water bodies, the discharge from hydrotesting activities will be done at a reduced discharge flow to allow for the soil to absorb the majority of the water preventing any wash-off effect on the freshwater fauna in the area.
- For the emission of light, as far as practicable, no intense light will be directed towards the freshwater habitats. Downward-facing lights will be used to manage horizon glow, while shielded light fittings and directional lights will be used to manage light spill, Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out.
- For the possible introduction of alien species, no freshwater or moist soil is to be discharged to the Project Area without a proper inspection from environmental specialists or ecologists. Moreover, no freshwater procured outside of the Project Area will be discharged into Filyos River or any other nearby natural freshwater habitat, and if spreading of invasive species is observed, an appropriate eradication program will be developed and implemented.

- Finally, for the increase and modification of traffic onshore, speed limits and animal crossing signs will be installed on the access road. The accumulation of stagnant water and organic waste will be avoided in order to not attract wildlife. If freshwater fauna species are encountered (amphibians), employees and contractors will wait until it moves on by itself or they will ask the assistance of the environmental specialist for its safe removal and relocation in a suitable environment.

The same activities and impact factors discussed for freshwater fauna are also expected to potentially impact terrestrial fauna during construction and operation phase. Since no change is expected between the operation phase and the current situation in terms of these impacts, implementing the mitigation measures discussed also for the previous component should allow a negligible impact on terrestrial fauna during both construction and operation phases.

During the operation phase of the FPU, the following impacts on marine birds are expected: the presence of new offshore infrastructures, the emission of aerial noise and vibrations, light emissions, and aerial heat emissions. To address these impacts, specific mitigation measures will be implemented. Bird spikes will be installed on handrails to prevent birds from perching on the FPU, and/or netting will be used to block bird access. Visual deterrents, including lasers, birds of prey decoys, and inflatable flapping men, will be utilized along with noise and vibration-emitting devices to deter birds and animals from high-risk areas. For the emission of aerial heat, no additional mitigation measures are proposed beyond those for the presence of new offshore infrastructures, as the goal is to avoid attracting bird species to the platform.

Possible impacts on habitats were also evaluated by averaging the impacts generated by each of the impact factors on all the above-mentioned components, leading to an overall negligible impact on habitats both during construction and operation phases.

Finally, potential impacts on legally protected areas and internationally protected areas were assessed. Based on the information collected for the definition of the baseline, Amasra Coast KBA/IBA falls within the Project Area of Influence. . Legally and internationally protected areas could be affected during construction phase by several impacts, including the removal of soil, the emission of dust, light, noise and vibrations and the possible introduction of alien species. Dust emissions can affect the vegetation health, while emissions of light, noise and vibrations could affect the general biodiversity (freshwater and terrestrial fauna and birds). Lastly, the possible introduction of alien species (flora or fauna alike) could have a cascade effect on local biodiversity by changing the species compositions. During operation phase, impacts should only be expected from the noise and vibrations. Implementing the mitigation measures discussed for the previous components should be sufficient to reach a negligible impact both during construction and operation phase.

3.8 Socio-Economic Impacts

Changes on the socio-economic environment and communities may originate from various positive and adverse environmental and social impacts that may result by the Project impact factors. Therefore, it is important to determine effective mitigation measures to minimize the negative impacts and enhance positive impacts of the Project.

Population and demography

Construction activities for Phase 2 is expected generate an influx of population in the Area of Influence. This will be mainly due to the workers that will move to the AoI, which is detailed in Section 2.5. A large portion of the workforce will be housed in existing TP-OTC camps from Phase 1, with priority given to local hires where

possible. Non-local staff will be encouraged to stay at the Project site or in district centres instead of villages. All workers must follow the Project's Code of Conduct. Cultural training for non-local staff will be provided. Key plans, including the Influx Management, Community Health and Safety, and Human Rights Plans, will be updated and enforced. Workers' basic needs will be met within accommodation areas to reduce pressure on local resources, with waste management and pollution control measures in place to protect the environment from increase in population. The Stakeholder Engagement Plan will be updated, with regular community consultations, liaison with mukhtars and the grievance mechanism established in Phase 1 will continue to address concerns raised by local residents.

During operation phase of the FPU, it is planned to employ total of 156 people for Phase 2, with 132 working on the offshore FPU and 24 added to the existing OPF staff. Immigration of workers and other people could also affect population and demography, even if with negligible impacts. The operational activities may result in long term population increase at local level. Key mitigation measures include, encouraging local institutions to co-operate on possible rapid development in the region, encouraging local suppliers to meet Project needs and develop corporate social responsibility projects to support local enterprises and local procurement from communities

Economy and employment

Due to the short duration of construction phase of the Project, and the maritime works requiring specialized personnel and supplies outside of the region, the employment opportunities that will be created locally will be minimal and not have a large impact as in Phase 1. Moreover, during the construction phase of the Project, neither direct nor indirect economic opportunities are expected to arise at the regional level. Considering the nature of the Project, procurement and subcontractor needs will be met through the global procurement market. However, efforts will continue to procure services and products, especially for the needs of employees, from the local region, to create a positive impact.

Although it is not expected to be observe major economic changes and local employment opportunities in Phase 2, to address the potential impacts by the demand of workforce, the demand for goods and local inflation, several mitigation measures will be implemented, among which:

- Formal and transparent recruitment process will continue to avoid discrimination and provide equal opportunities to the applicants.
- The mukhtars of the settlements will be informed about the recruitment opportunities of the Project to reduce the requirement of the non-local labour force.
- Vocational training will be offered, to the extent possible, to local people to maximize the local labour force.
- Before the procurement, local suppliers will be identified, and priority on purchases will be given to goods and services from local businesses.
- Capacity development will be offered to local businesses.
- Equal procurement opportunities will be provided to local small businesses.
- An equal tender process will be applied.
- All subcontractors will be monitored with regard to compliance local employment and local procurement requirements.

During the operation phase, in parallel with the long-term procurement opportunities, the Project is expected to attract more investors in the Project region. In addition to the implementing the mitigation measures developed for the construction phase, on the job and vocational training programmes will be provided especially for the local employees to increase the skilled personnel and encourage the promotion. Local supplier survey will be done and capacity building programs will be implemented to support the local economy by procuring locally. Small businesses and the women entrepreneurs will be identified and supported to create and employment procurement opportunities for the locals and the vulnerable.

Land use

For the construction plans of the Phase 2, the existing acquired lands during the Phase 1 will be used, and no additional land acquisition, expropriation, or renting will take place. The current camps within the SGFD boundaries will be used for the employees. The existing roads will be used in the construction phase of the Project and no link road is planned.

Considering the nature of the Project, no impacts on land use and land-based livelihoods are expected during the operation phase.

Although minimum impact is expected in terms of land use, to mitigate the impact of changes, key mitigations will be implemented:

- While no expropriation is planned, the Project will always ensure that engagement and consultation will be conducted to inform landowners and users that may be impacted in the AoI, about the planned construction activities.
- To protect shepherds and villagers from traffic signs, markers, crossings and similar protective measures will be implemented.
- Coordination with the villagers especially about the road conditions will be established to prevent the animals from the unwanted hazards.
- Compensations, land damages and other expropriation related grievances of the villagers related to Phase 1 will be monitored and addressed.
- Grievance mechanism will continue to be implemented to collect grievances related to land use.

Infrastructure and services

Construction activities will generate an increase in traffic compared to the current situation for the transport of workers, goods and materials. The existing roads will be used during construction phase of the Project and no road widening is planned. In addition, no link road is planned for the construction phase. A Traffic Management Plan is developed to ensure the application of measures that can reduce impacts generated by the additional traffic due to the Project. Management of traffic will involve:

- Organize vehicle journeys so to optimize the transport of materials and reduce unnecessary trips.
- Identify speed limits in construction areas and in public roads and ensure that they are respected by drivers.
- Identify sensitive receptors (e.g. mosques, schools, areas without sufficient sidewalks, areas where animals graze) within the AoI and identify additional road safety measures in proximity to these receptors.

- Perform traffic safety awareness campaigns targeted at local communities and vulnerable groups, such as children and elderly, that may be increasingly involved in road accidents.
- Ensure that vehicles are equipped with all safety devices such as seat belts, mirrors, safety signals etc.
- Periodically check all vehicles to ensure that they are properly maintained and that all the safety devices are working properly.
- Verify and register of all traffic related incidents and periodically revise road safety measures based on lessons learned.
- Within the context of the SEP, inform local authorities, local communities on the progress of activities and in particular on the schedule of activities that will entail closures/limitations of roads and interruption of infrastructure networks; possible changes to limit impacts on local communities will be agreed and implemented.
- Continue to monitor grievances for improvement opportunities.

While the maritime traffic is managed by the Port Authority, TP-OTC will implement measures through planning and supply chain management:

- Design the route for construction vessels to minimize interference with existing commercial and local traffic.
- Coordinate construction activities to avoid peak traffic times, thereby reducing the risk of congestion and delays on maritime traffic.
- Establish clear communication channels with local fishers and other users of the ports and harbours to inform them of Project activities and any potential disruptions in advance.
- Ensure that all vessels of the Project and Project's supply chain adhere to established maritime regulations by Zonguldak Regional Port Authority to reduce the risk of collisions and enhance overall safety.
- Engage with the Zonguldak Regional Port Authority regularly to ensure that maritime operations are compliant with safety and regulatory standards, and to facilitate effective communication about Project activities and any potential impacts on local maritime traffic.
- Ensure that non-compliance will result in penalties for supply chain components, which will be monitored regularly and inform related parties accordingly.
- Establish clear guidelines and protocols for vessel navigation to reduce the chances of collisions.
- Regularly update emergency response plans to ensure swift action in the event of a collision or near-miss.
- Integrate safety measures into the supply chain logistics, such as scheduling deliveries during off-peak traffic times and coordinating with shipping companies to ensure that vessel movements align with maritime traffic patterns to minimize and reduce the risk of congestion and collisions.
- In case of damage to fishers and/or their equipment, there will be specific protocols to address and compensate for losses.
- Provide training for local fisheries on maritime safety practices and the importance of adhering to navigational regulations to further enhance safety and reduce potential risks.

Freshwater will be required by the Project during the construction phase mainly for workers, to prevent dust emissions and for the operation of concrete batching plant. The drinking water of the personnel will be bottled water. The potable water and any water needed for construction purposes will be supplied from Filyos and Saltukova Municipalities, stored in water tanks and distributed through potable water infrastructure. With regards to offshore activities, some vessels will be equipped with desalination equipment to obtain utility water. Support vessels will supply water to the vessels that are not equipped with desalination equipment. To mitigate the effects of increased demand of freshwater, water saving strategies will be implemented, particularly to reduce consumption of water for civil uses among workers. Indications on water saving initiatives will be provided to workers during induction and periodic training. In addition, control on sufficiency of Sazköy water sources which is relocated during Phase 1 will be provided.

Construction activities will entail the production of waste of various nature, both hazardous and non-hazardous, which will have to be disposed of. Waste management will continue as in the current conditions within the framework of agreements with the relevant municipalities and disposal facilities. The Waste Management Plan that includes an identification of the waste disposal facilities for the Project and selects those that are less impacting from an environmental and social standpoint will be updated and implemented.

During the operation phase, limited traffic will be generated by the Project during this phase and will be relative to staff entering and exiting the site daily. Based on the traffic load generated by the Project during the operation phase, no significant impacts on traffic are therefore expected. Regarding the demand of freshwater, water requirement will be substantially lower during the operation phase compared to the construction phase. The potable water, utility water, process water, and fire-fighting water will be supplied by the groundwater wells, after obtaining necessary permissions from the relevant institutions. Lastly, waste will be managed in line with Turkish legislation through authorized contractors, which are expected to be able to manage the amounts of waste generated by the Project. Considering the type and amount of waste produced during operation, the Project is not expected to add increased pressure on existing waste disposal systems and infrastructures.

Community health and safety

Since construction is limited to a small area compared to Phase 1, mainly at the landfall site, significant dust or fallout is not expected. However, exhaust emissions, vibration, and noise may affect areas near roads used by project vehicles, with the nearest settlement, Sazköy, located 300 meters from the site. Increased traffic for transporting workers and materials could raise accident risks, especially in villages. The arrival of workers from other regions may heighten the risk of communicable diseases spreading and increase potential tensions with local communities, particularly affecting women and vulnerable groups. Existing on-site security measures, including 3rd party security and gendarmerie at main gates, minimize the likelihood of major security incidents..

During the operation phase considering the number of workers involved in this phase, which is determined as 156, it is unlikely that there will be an increase in the spread of communicable diseases. Likewise, considering the numbers involved, it is not expected that the presence of workers will add pressure to the existing health system in the AoI or generate particular tensions or disturbance with local communities. Several mitigation measures will be implemented for both the construction and the operation phases:

- Specific measures and mitigations for dust and exhaust emissions and exhaust emissions from vessels are provided in the Air quality section (3.1). For the emission of aerial noise and vibration details are shown in the Noise and Vibration section (3.5). Monitoring in the settlements within the AoI will continue.
- A health screening of all workers prior to beginning of work and on a periodic basis will be performed

- An induction training and periodic training to all workers on Health & Safety aspects and on communicable diseases will be provided.
- Community Health, Safety and Security Management Plan will be updated include the measures indicated in this section and additional measures that may emerge from engagement with stakeholders.
- Emergency Preparedness and Response Management Plan will be updated according to changing site conditions.
- Meeting with the stakeholders will be organized to inform them about the updates and implementation of the CHSS Plan, ERP, and Grievance Management system. Women meetings will be organized separately to take feedback from women.
- Grievance mechanism will be implemented to collect and resolve issues regarding community health and safety.
- Traffic Management Plan and road risk assessments will be kept up to date considering the latest Project schedule.
- Measures for pedestrians, shepherds and animals detailed in previously in this document, will be evaluated and implemented as necessary.
- Within the context of the SEP, inform local authorities, local communities on the progress of activities and in particular on the schedule of activities that will entail closures/limitations of roads and interruption of infrastructure networks; possible changes to limit impacts on local communities will be agreed and implemented.
- Before the construction and operation, local communities will be informed about the restrictions to entering the construction and operation sites.
- Security personnel will patrol the site to prevent any unauthorized access.
- Conflict Management Training will be provided to armed security personnel.
- All security personnel will be trained on and adhere to the provisions of:
  - the Law No. 5188 on Private Security Services, which regulates the provision, licensing, and oversight of private security services in Türkiye, establishing the legal framework for private security companies, personnel, and their duties;
  - IFC Good Practice Handbook, Use of Security Forces: Assessing and Managing Risks and Impacts; Guidance for the Private Sector in Emerging Markets (Feb.2017)
- All vessels will operate according to the following standards. TP-OTC will ensure these standards are communicated to contractors and suppliers, and enforced through their contracts, with penalties or other remedies applied in cases of non-compliance.:
  - MARPOL (International Convention for the Prevention of Pollution from Ships). (1973/1978). International Maritime Organization.

- SOLAS (International Convention for the Safety of Life at Sea). (1974). International Maritime Organization.
- COLREG (International Regulations for Preventing Collisions at Sea). (1972). International Maritime Organization.
- ISM Code (International Safety Management Code). (1998). Part of SOLAS, International Maritime Organization.
- ISPS Code (International Ship and Port Facility Security Code). (2004). Part of SOLAS, International Maritime Organization.
- STCW (International Convention on Standards of Training, Certification, and Watchkeeping for Seafarers). (1978, as amended). International Maritime Organization.
- MLC (Maritime Labour Convention). (2006). International Labour Organization.
- Ballast Water Management Convention (BWMC). (2004). International Maritime Organization.
- ILO Conventions Related to Maritime Employment. Various dates. International Labour Organization.
- Load Lines Convention (LLC). (1966). International Maritime Organization.
- Tonnage Measurement Convention (ITC). (1969). International Maritime Organization.
- SAR (International Convention on Maritime Search and Rescue). (1979). International Maritime Organization.
- IBC Code (International Code for the Construction and Equipment of Ships Carrying Dangerous Chemicals in Bulk). (1983). International Maritime Organization.
- Polar Code (International Code for Ships Operating in Polar Waters). (2017). International Maritime Organization.
- AFS Convention (International Convention on the Control of Harmful Anti-Fouling Systems on Ships). (2001). International Maritime Organization.
- CLC (International Convention on Civil Liability for Oil Pollution Damage). (1969, as amended). International Maritime Organization.
- IMDG Code (International Maritime Dangerous Goods Code). (1965, as amended). International Maritime Organization.
- Hong Kong Convention (International Convention for the Safe and Environmentally Sound Recycling of Ships). (2009). International Maritime Organization.
- Torremolinos Protocol (International Convention for the Safety of Fishing Vessels). (1993). International Maritime Organization.

- Training will be provided to local sea users and fishers on COLREG and Basic Navigation and Safety Rules for Small Vessels.

Cultural heritage and archaeology

According to definition of IFC PS8, cultural heritage refers to tangible forms of cultural heritage, such as tangible moveable or immovable objects, property, sites, structures, or groups of structures, having archaeological (prehistoric), paleontological, historical, cultural, artistic, and religious values; unique natural features such as sacred groves, rocks, lakes, and waterfalls; and intangible forms of culture that are proposed to be used for commercial purposes, such as cultural knowledge, innovations, and practices of communities embodying traditional lifestyles.

The SGFD is located in the immediate vicinity of some registered archaeological sites. In this context, during the national EIA studies of Phase 1 and Phase 2 the opinion of Karabük Regional Board for the Protection of Cultural Heritage have been requested. It was stated that no cultural asset was encountered on the natural gas route in question. However, if any cultural assets are encountered in the said project areas within the scope of the Law o. 2863, it is reported that it is necessary to act in accordance with Article 4 of the Law. The national EIA boundary of the Project has been identified to not overlap with any cultural heritage sites offshore.

A Cultural Heritage Management Plan and a Chance Find Procedure was developed during Phase 1 and since then it has been implemented. TP-OTC employs a Cultural Heritage/Archaeological Monitoring Specialist dedicated to the SGFD.

Cultural heritage could be impacted by the removal of soil during site levelling and grading activities performed in the course of construction phase, whilst no impacts are expected during operation phase. The Cultural Heritage Management Plan and the Chance Find Procedure includes mitigation measures such as:

- Information and training will be provided to the workers to raise awareness about the archaeological sites.
- In particular, truck drivers will be informed that the materials that are considered as waste should not be dumped into these areas.
- Measures will be taken to prevent access to such areas (i.e., by marking the archaeological site with signs similar to "no entry, sensitive zone").
- Boundaries of the site will be confirmed, and measures will be taken to prevent possible physical interventions in the site.
- Human and vehicle traffic along the boundaries of the area will be minimized.
- While not anticipated, in case the usage of the ancient bridge is planned in order to access Project site, speed-reducing applications can be made, and speed can be reduced at this point with the signs to be placed on the road with the approval of relevant authority of the highways.

As regards of intangible cultural heritage, every year, Nevruz is celebrated in the central places of the settlements or in the playgrounds on 21 March. It was informed that spring celebrations such as Nevruz and Hıdrellez were celebrated until recently in a flat area approximately 2250 m away from the Project Site and between Derecikören and Çömlekçi Villages. It was learned that agricultural products grown in Sazköy and Derecikören villages were used for promotion and marketing purposes in festivals held in various periods throughout Zonguldak.

Key mitigation measures for the management of intangible cultural heritage are the following:

- Mobility of public and vehicles in the region during the planned activities will not be prevented

- It will be ensured that transit routes are left for uninterrupted access to areas regularly visited by the public
- Contractors and subcontractors will be trained on the code of conduct, including their approach to relations with local communities, during the employment phase and at regular intervals throughout the Project
- Information will be provided to contractors and subcontractors on any site-specific sensitivity/issue (e.g., festival locations, dates, events, etc.) regarding intangible cultural heritage.

Lastly, general mitigations will be implemented, such as:

- The Cultural Heritage Management Plan and Chance Finds Procedure prepared within the scope of the Project will be implemented throughout the Project. In case of chance find, all work must cease at the location where discovery is made and a temporary buffer zone around the chance find will be put in place. Cultural Heritage/Archaeological Monitoring Specialist will be informed site management and museum archaeologist immediately. Chance find site will be properly secured with flagging, no-entry signs etc.
- Protection of site: chance find should not be moved, removed or further disturbed
- In particular, all operators and Project workers assigned to land preparation works should receive training on project requirements, protection of cultural and archaeological heritage, laws and regulations regarding archaeological and cultural heritage, Cultural Heritage Management Plan and Chance Find Procedure.

Regarding marine archaeology, even if the information collected did not reveal the presence of evident marine archaeological heritage, dataset allowed to recognize only a possible modern shipwreck at a depth of 1384m, about 100 m long and 22 m wide positioned about 190 m from the Phase 2 pipeline route, which will be investigated with an ROV prior to construction. No other target/contact has been recognized along this section of the corridor.

In conclusion, after several surveys, no archaeological features were found in the proximity of the facilities in the marine portion of the Project. However, the morphological studies highlighted that only the closest section (first kilometre) to shore of the corridor shows wide bathymetric variations in relation of the Filyos River discharge which, during seasonal variations of sedimentary regime, can potentially uncover eventual materials.

Following mitigation measures have been developed:

- In the eventuality that the removed sediment presents some foreign object this should be immediately inspected and its photographic records should be taken, if the object/s are not immediately identifiable as modern age debris the coordinates of the finding should be recorded and the photos should be immediately provided to an archaeologist for a preliminary assessment of the material. The initial assessment will be then discussed with the responsible of offshore construction operations for an eventual temporary alt of the activities.
- An ROV inspection on the possible shipwreck location is needed before commencing construction works. This will open the way to two main scenarios:
    - If the presence of a modern historical wreck (e.g. WW1 or WW2 vessel) is confirmed a no-activities buffer area of 100-150 m (depending on conditions of the wreck and engineering requirements) should be considered around the it while laying the pipeline.

- In the case there is no confirmation of a modern historical wreck no specific mitigation would be required for this impact factor.

Ecosystem services (Fishery and Tourism)

According to the information collected, the fishing sector has importance in the Area of Influence of the Project in the last decades. According to the fishers, the impact factors resulting from the Project's activities are that fish cannot be seen due to lights emissions of operation and the increasing sea temperature and the effect of global warming are reducing the number and species of fish.

In addition to the existing Phase 1 safety corridor of 500 m on either sides of the Phase 1 SURF, there will be an additional safety corridor established during the construction of the Phase 2 export pipeline. The 500 m corridor on either sides of the export pipeline will be announced by NAVTEX announcements. The restrictions and conditions for the safety corridor is as follows:

- Anchoring is restricted
- Marine activities including fishing (using trap nets and rods) and diving are restricted.

Following restrictions will continue to be announced by NAVTEX:

- Cruising 2 km distance from the Project vessels
- Approaching 500 m to the Port.

When dealing with a vessel, the leakage of small amounts (i.e., negligible, but still present) of contaminants (mostly oily and greasy) from the engines is considered "physiological" and inevitable. Contaminants of such typology are mostly insoluble in water and tend to remain on the surface, potentially affect the fishes and thus fishing activities.

Vessels are expected to be the main responsible for the emission of underwater noise during the pipelaying.

Following the completion of the construction phase and before the operation of the pipelines, all the pipes will be hydrotested by pumping liquids. The hydrotest fluids are planned to be discharged deep sea, in correspondence to the SPS site, where they may cause alteration of the seawater quality. Nevertheless, as previously discussed, this alteration is not expected to affect marine life, since the discharge point is located in the anoxic water layer, where no life exists.

In addition to the mitigation measures elaborated in Section 3.7 the following mitigation measures shall be implemented to mitigate the effects of the impact factors:

- Regular and timely engagement with local fishers and other users of local harbours and ports in order to discuss and agree on NAVTEX area.
- Timely communication of the security zone to local fishers and other users of local harbours and coordinating the practical consequences of such security zone.
- Regular and timely communication to local fishers and other users of local ports and harbours about construction activities and the routes and frequency of Project vessels.

- SGFD's existing Livelihood Restoration Plan will be updated for the Phase 2. Impact on fishers' livelihoods will be monitored at intervals identified in the Livelihood Restoration Plan. Impacts will be mitigated and addressed according to the LRP.
- TP-OTC will ensure that all it's vessels and the vessels in its supply chain including the contractors will comply with the following:
  - All vessels will be compliant with MARPOL.
  - All vessels will comply by the maritime traffic requirements and regulations enforced by the Port.
  - Outdated engines to be avoided in favour of recent and well-maintained ones.
  - In case of any leakage fishers will be informed.
  - Outdated propellers to be avoided in favour of recent and well-maintained ones, possibly anti-cavitation.
- Training will be provided to fishers and other sea users on COLREG and Basic Navigation and Safety Rules for Small Vessels.
- Light emissions will be focused within the Project Area boundaries.
- Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out.
- In order to prevent pollution during hydrotesting, mitigation measures identified in Sections 7.1 and 7.2 will be implemented.

Marine Traffic

Marine traffic will be generated by PSVs and maintenance vessels. Some incidents may result in spills and discharges that might spread, also affecting marine life. To cope with predicted impacts, various mitigation measures have been developed and summarised in Community Health, Safety and Security Section and Sections 3.7 Biodiversity.

Visual aesthetics

Phase 2 impacts will be limited in significantly limited areas within the SGFD boundaries. In this regard, no major visual impacts due to Phase 2 are anticipated. Visual aesthetics will potentially be affected by the Project via the removal of soil and the emission of light.

Regarding the emission of light, regarding the current site conditions that there already exists lighting due to security and operational reasons; it is expected that additional artificial lighting will generally not be necessary during construction. However, on some occasions it may be necessary to work at nighttime and hence artificial lighting may be used. In addition, some construction areas may have to be illuminated for security reasons. Regarding the current conditions of the site where SGFD phase-1 onshore structures are in operation; the site and its surrounding are lightened in order to execution of the operations and also for security reasons. Therefore, during the construction activities of the Project, there will be no need for additional lighting for execution of the construction. Despite this, to mitigate light emission, If necessary, agreements will be taken

with surrounding receptors and local communities to identify and implement measures to reduce unwanted lighting.

For the removal of soil, it will be conducted during the Phase-2 pipeline construction in a limited area onshore. The area directly impacted by the landfall construction works corresponds to approximately 2 ha. Campsites are areas that are already existing and within the scope of operation, and no construction work will be carried out regarding soil removal perspective. As a result, no additional visual impact is expected during Phase 2 as the Phase 2 pipeline will also be constructed within the existing facility boundaries.

Following mitigation measures will continue to be implemented:

- Limits of construction areas will be clearly marked or fenced in order to avoid impacts outside this area;
- No construction activities will be carried out in the eastern section of the Phase 2 pipeline footprint, given the presence of endemic and CH-triggering flora species;
- All vehicles will drive on designated routes unless otherwise authorized, and off-road driving will be strictly prohibited;
- If necessary, agreements will be taken with surrounding receptors and local communities to identify and implement measures to reduce unwanted lighting.
    - Light emissions will be focused within the Project Area boundaries.
    - Lights will be mounted as low as practicable.
    - Shielded light fittings and directional lights will be used to manage light spill.
    - Use of artificial light will be limited to what required to maintain a safe working environment during construction activities past sunset and before sunrise.
    - Unnecessary lighting will not be used, including lights in unused areas, decorative lighting, or lighting that is brighter than needed for the task being carried out.
    - Where practicable, timers and motion sensors will be used to turn off lights when not in use (e.g., sunset switch on, timer off for lighting used for walkways, car parks, and roads).

Human rights

As part of the ESIA studies, Project human rights impact assessment was held to identify the mitigation methods for the potential impacts on the local communities and Project direct and indirect workers in compliance with Equator Principles IV, specifically the following clause: “The client is expected to include assessments of potential adverse Human Rights impacts and climate change risks as part of the ESIA or other Assessment, with these included in the Assessment Documentation.”

HRIA is an instrument for examining policies, legislation and programs to identify and measure their effects on human rights. Their fundamental purpose is to help prevent negative effects and to maximize positive effects.

Human rights in Türkiye are protected by various international regulations, conventions treaties in addition to the national legislation. To prevent the human rights impacts, an action plan for human rights for Türkiye was prepared by Ministry of Justice in March 2021.

Human rights impacts are influenced largely by the local human rights context and the nature of a project's specific activities. and shall address potential risk and impacts in at least the following areas:

- Civil and Political Rights
  - Freedom of expression
  - Right to life and security
  - Privacy
- Labour Rights
  - Child labour
  - Collective bargaining and freedom of association
  - Modern slavery (forced labour/human trafficking)
  - Grievance mechanism and remedy
  - Job security/right to work
  - Non-discrimination
  - Occupational health and safety (H&S)
  - Wages (pay equity, standard of living)
  - Working hours
- Social rights
  - Right to education
  - Right to health
  - Right to participate in the cultural life of the community
  - Right to water
  - Social insurance
- Vulnerability
  - Gender and the rights of individuals
  - Children, disabled individuals, and migrants

This study has determined the levels of human rights risks and potential mitigation measures that are pertinent for the Project. Based on the study, a Human Rights Management Plan was prepared that provides indications on the management and monitoring process that will implemented by TP-OTC to ensure respect of Human Rights. The Plan will be updated for the Phase 2, as necessary and TP-OTC will continue to implement human resources policies aligned with international standards and national law, requiring contractors to follow these standards. Recruitment will be fair, centralized, and transparent, with written contracts provided in workers'

native languages. Safety measures, fair wages, non-discrimination, and freedom of association are prioritized. Child and forced labour are prohibited, with periodic audits to ensure compliance. Workers will have a grievance mechanism and the right to safe working conditions, while local businesses will receive support and equal procurement opportunities. Community health, safety, and environmental management plans will be maintained, with security personnel trained on legal and conflict management standards to protect workers and local residents. The Stakeholder Engagement Plan and grievance mechanisms will ensure continuous communication with and support for local communities.

3.9 Cumulative Impacts

In the context of the ESIA of the Project, the cumulative impacts are the impacts arising from the concurrent presence of impact factors caused by the Project and the other development projects are considered. The cumulative impacts (on onshore and offshore components) have been assessed taking into account spatial, temporal or thematic overlap with other projects or facilities in the AoI of the SGFD Project Phase 2.

The expected contributing facilities to any cumulative impact on physical and biological components within the Project's AoI are limited to those from the projects given below.

- TP-OTC SGFD Phase 3 – Drilling – testing –development of Offshore wells
- the TP-OTC SGFD Phase 3 – FPU
- the TP-OTC SGFD Phase 3 – Offshore Pipeline.
- the Filyos Integrated Fertilizer Production Facility Project
- Port Hinterland Area
- East Quay Operation Management Center (OMC)
- Filyos Port Master Plan
- Filyos Port / Industrial Zone Connections - Railroad

The overall evaluation of such impacts showed a low to negligible contribution (residual impact) of the Project for all the identified components. In the eventuality of additional residual or direct impacts from the before mentioned projects the only elements requiring particular attention have been indicated as those regarding atmospheric emissions, riverine and seawater contamination, and the increase and modifications of traffic. The presence of such potentially criticalities, also affecting sensible components (i.e., habitats, birds, freshwater fauna, etc.), highlights the necessity to properly implement the monitoring measures proposed in this document and to promptly intervene to assess and, when needed, further mitigate in case any contamination or negative interaction with traffic is detected.

4.0 IMPACTS MITIGATION AND MANAGEMENT

To ensure these mitigation measures are effectively implemented, adequate resources and project management planning will be put in place as guided by an Environmental and Social Management Plan (ESMP) package available for the project.

The ESMP is an integral part of the ESIA as it is a system setting document for the Project and its contractors and represents a commitment towards environmental and social sustainability applied to the Project's entire life

cycle. The ESMP is an overarching document developed in accordance with the corporate Parent (TPAO) and Subsidiary Company (TP-OTC) Integrated Management System (IMS) policies and TPAO Sustainability policy, including the SGFD Project specific HR Policy and Procedure, with the commitments included in the Environmental and Social Impact Assessment (ESIA) and, more broadly, with the Turkish regulatory framework relevant to the Project as well as with the E&S Standards that apply to the Project. These include the IFC Performance Standards (IFC PS) and IFC General and Sector Specific Environmental, Health and Safety (EHS) Guidelines, and Equator Principles (EP) IV. The Project ESMP consists of several sub-management plans as demonstrated further in Table 1, in which the ESIA mitigation measures are reflected and compliance with applicable Project legislation, standards and limits are ensured.

A key objective of the ESMP is to "operationalise" the E&S (including occupational health and safety) commitments and mitigations as identified in the Phase 2 ESIA to ensure that the SGFD Project (including construction, operation, and decommissioning) is undertaken in a way to minimise the negative impacts on the physical, biological, and social environments in the Project-affected area.

More specifically, the Environmental and Social Management System (ESMS) defined within this ESMP will:

- Establish environmental and social management standards that comply with or surpass Good International Industrial Practices (GIIP) and reasonable community expectations.
- Adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize and restore E&S impacts.
- Develop and implement policies, plans and procedures to integrate E&S aspects within the overall project management framework throughout its lifecycle.
- Facilitate the implementation of management plans as defined by the ESIA for the avoidance, minimisation and control of E&S impacts.
- Inform Project personnel about their responsibilities with respect to E&S issues and to monitor the manner in which those responsibilities are implemented.
- Train Project personnel, contractors and community representatives, as necessary, in relevant environmental and social procedures, actions, and monitoring programs.
- Establish a monitoring program to assess the effects of residual impacts on the environment and monitor the ESMS performance.
- Provide for periodic system audits and identify corrective actions, if necessary, to reach the planned objectives.

TP-OTC has developed a set of ESMPs and procedures consistent with their policies and commitments, addressing the environmental and social impacts and relevant mitigation measures identified in the Phase 1 ESIA for each component. The full set of ESMPs have been updated for Phase 2 and implemented for fulfilling the commitments undertaken by the Project are presented in the Table 1 with the relevant IFC PSs that each will contribute to comply with.

Table 1: ESMPs

Relevant IFC PS	Plans / Procedures
IFC PS1 5-24: Assessment and Management of Environmental and Social Risks and Impacts	■ ESMP – Framework (ESIA Chapter 12) ■ Stakeholder Engagement Plan
IFC PS2: Labour and Working Conditions	■ Human Rights Management Plan ■ Camp Site Management Plan ■ Offsite Accommodation Plan ■ Labor Management Plan ■ Contractor Management Plan ■ Supply Chain Management Plan (to be prepared) ■ OHS Management Plan (to be prepared)
IFC PS3: Resource Efficiency and Pollution Prevention IFC EHS Guidelines	■ Resource Efficiency Management Plan ■ Pollution Prevention Plan (e.g., air, noise, wastewater, soil, ground water contamination, hazardous material management, etc.) ■ Waste Management Plan ■ Soil Management and Erosion Control Plan
IFC PS4: Community Health, Safety, and Security IFC EHS Guidelines	■ Influx Management Plan ■ Traffic Management Plan ■ Community Health, Safety and Security Management Plan ■ Emergency Preparedness and Response Management Plan
IFC PS5: Land Acquisition and Involuntary Resettlement	■ Livelihood Restoration Plan
IFC PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	■ Biodiversity Management and Reinstatement Plan
IFC PS7: Indigenous Peoples	■ Not applicable
IFC PS8: Cultural Heritage	■ Cultural Heritage Management Plan (including Chance Find Procedure)

The ESMPs will be implemented across the TP-OTC Project organization, including, contractors, subcontractors and primary suppliers over which TP-OTC has control or influence and inside the Project Area of Influence including the associated facilities.

ESMPs will provide the objectives of the document, the reference legal requirements, roles and responsibilities for its implementation, links to other management plans as necessary, a list of the mitigation measures,

monitoring and reporting requirements, identify qualitative or quantitative Key Performance Indicators (KPIs) and measures to be used to monitor the effectiveness of the mitigation measures identified during the impact assessment process, training requirements as needed.

Besides a similar structure, the level of detail and complexity of each management plan will be commensurate with the expected impacts and risks of the Project as identified in the ESIA. Each management plan will include the mitigation measures identified in the relevant sections of the ESIA and will be disclosed to the stakeholders as provided by the Stakeholder Engagement Plan (SEP, 5.0). The ESMPs will be shared with all contractors to ensure they will develop their own equivalent management plans, procedures and work instructions aligned with the ESMP with additional mitigation measures specific to their activities, as needed.

5.0 STAKEHOLDER ENGAGEMENT

Stakeholder engagement aims to inform stakeholders about the potential environmental and social impacts related to the project through appropriate disclosure of information, to ensure their perceptions of the proposed development are as accurate as possible, to consult with them to obtain feedback, and to provide a mechanism for resolving any concerns or complaints they might have.

The stakeholder's identification and engagement processes started at early Project preparation stages and were performed by TPAO & TP-OTC employees and Project consultants during direct meetings with authorities, key stakeholders, and representatives of local community.

Engagement activities for the national EIA of Phase 2 were initiated with a Public Participation Meeting (PPM) held on August 8th, 2024. The PPM provided opportunity to the local residents to be informed about the Project and to express their opinions and concerns. The scope and the organization of the meeting was determined as per the "Environmental Impact Assessment Regulation" which is published in the Official Gazette dated 25.11.2014 and numbered 29186 by the Ministry of Environment and Urbanization. The Public Participation Meeting was held at the Filyos Municipality Wedding Hall, approved by the Ministry of Environment and Urbanization, at 10:00 on August 8th, 2024, with the participation of ETC, the company that prepared the EIA report, and a team from Türkiye Petroleum A.O as the Project owner. Approximately 95 people were attended to PPM including national EIA consultant of the Project, TPAO representatives, Ministry representatives, local communities and the mukhtars of the settlements.

As part of the ESIA studies for Phase 2, several key activities have been conducted to gather comprehensive data and engage with the affected communities. The surveys and interviews conducted in the settlements about the Project are presented in Table 2 below. These activities include field surveys in affected settlements of Sazköy, Aşağıihsaniye, Sefercik, Gökçeler, Derecikören, and Yeşilyayla to collect primary data, detailed household surveys to assess various socio-economic aspects and community concerns and focus group discussions specifically with women to ensure their voices are heard. A total of 113 Household Surveys (HHSs) were conducted across six settlements.

Table 2: Stakeholder Engagement Activities Held During the ESIA Process

Survey	Stakeholder Group	Details of consultations
Public Participation Meeting	Local residents and all stakeholders	Scope of the Project, its location, the environmental characteristics of the Project AoI, the objectives and necessity of the Project, its specific features, capacity and lifespan, land use within the Project, potential environmental impacts and the measures to be taken, photographs of the land section of the Project, and the institutions informed about the Project
Community Level Surveys	Mukhtars of Derecikören, Yeşilyayla, Sefercik, Gökçeler, Aşağıihsaniye and Sazköy	Population, migration, ethnic composition, age distribution, social facilities and infrastructure, education, social conflict and unrest, social cohesion, livelihoods, income generating activities, and land use.
Household Surveys	113 household surveys in Derecikören, Yeşilyayla, Sefercik, Gökçeler, Aşağıihsaniye and Sazköy Villages	• The level of knowledge on the planned Project; • Access to information mechanisms; • Major complaints about construction and operation of Phase 1; • Socio-economic features of the households, general conditions of houses; • Livelihoods and income generating activities; and • Land ownership and land use information • Educational skills of household members that can be used in construction and operation stages of the Project.
Fisheries Survey	20 in depth fisher interviews	Impact on their livelihoods and gather their recommendations to prevent the impact on the livelihoods

Survey	Stakeholder Group	Details of consultations
Focus Group Discussions	6 focus group discussions with women in each village	Engage with specific segments of the community that might require special engagement and attention, i.e., women, youth, elderly and vulnerable groups.
Key Informant Interviews	Filyos Aquaculture Cooperative	Interviews with individuals who have specific knowledge and expertise in certain areas relevant to communities about the Project

The SEP will be progressively developed through updated versions in line with the phases of the Project and will be made accessible to local communities and publicly available on TPAO website at the following link: ***https://tp-otc.com/en/sustainability/***

According to the SEP, the engagement activities envisaged for the Project are mainly focused on the disclosure of the outcomes of the ESIA process and mainly includes engagement with the following key stakeholders:

- Primary stakeholders, namely the individuals and the communities who are affected by the Project impacts directly; and
- Secondary stakeholders, which are those who have an interest or influence on the Project.

The key stakeholders thus include:

Primary stakeholders

- National Authorities,
- Regional /Local Public Authorities,
- Employees of the Project,
- Subcontractors of the Project,
- Affected Communities:
  - Residents living in close proximity to Project area: Çaycuma District and Filyos and Saltukova Town Villages of Sazköy, Aşağıihsaniye, Gökçeler, Derecikören and Yeşilyayla; and Sefercik neighbourhoods.
  - Local government and community representatives, local leaders, i.e. mukhtars and other community leaders/representatives.
  - Women, children, elderly people, and any other vulnerable people who live in the Project affected villages.
  - General Public (including residents of, and visitors to, the Local Communities).
  - Community services and Infrastructure organizations.

- Businesses in nearest settlements.
- Agricultural and Animal Husbandry Enterprises in Filyos and in the settlements within the Project AoI.
- Fisheries and Fishery organizations representing those who perform fishing activities in the Project area.
- Land users for agricultural and animal husbandry purposes, and beneficiaries from the nearby forests within the Project AoI.
- Tourists using Filyos beach.

Secondary stakeholders

- Other businesses in the region,
- Non-governmental organizations,
- Media,
- Academic and research organizations.

The stakeholder engagement process of the Project will be monitored periodically. According to the outputs of the monitoring indicators, the SEP will be updated, and the necessary corrective actions will be implemented during the different stages of the Project by the Social Impact Specialist.

The “Grievance Mechanism” is a key element of the SEP and it provides an easy way for anybody to submit their questions, suggestions or complaints (together called “grievances”) to the Project representatives. All stakeholders can submit any questions, suggestions or complaints; verbally during a meeting, via website, email, call, or official correspondence etc. All forms of grievances will be recorded under the Grievance Mechanism, and all such grievances submitted are tracked and must be responded to within 30 calendar days.