

# **TANAP Project's Executive Summary of ESIA and Supporting Environmental and Social Safeguard Documents**

22 July 2016

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## EXECUTIVE SUMMARY OF ESIA AND SUPPORTING ENVIRONMENTAL AND SOCIAL SAFEGUARD DOCUMENTS

### FOR SUBMISSION TO WORLD BANK'S BOARD AS PER PELOSI REQUIREMENT

This document is the Executive Summary (ES) of TANAP ESIA and supporting environmental and social safeguard documents. The ES is disclosed on TANAP's website together with all the supporting documents, which are listed as follows:

- i) Existing ESIA (as disclosed on TANAP's website, dated 22 June 2015, cleared by MoEU on 24 July 2014);
- ii) Resettlement Action Plan (RAP, as disclosed on TANAP's website, dated 23 April 2015);
- iii) Biodiversity Action Plan (BAP, latest revision dated 12 July 2016)
- iv) Environmental and Social Management Plan (ESMP, latest revision dated 21 July 2016). ESMP also covers the following:
  - Environmental and Social Action Plans (ESAP, including the EPCM Contractor's ESMP and Construction Contractor's (CC) sub-management plans on environment and social such as waste management plan, traffic management plan, community safety management plan),
  - Environmental and Social Monitoring Plan, and
  - Cultural Heritage Management Plan (CHMP, with the addition of current implementations such as the signed protocol with Ministry of Culture and Tourism and archaeology Consultant's scope of work etc.).

In addition, TANAP is using an Environmental and Social Management System (ESMS)<sup>1</sup> which can be described as the system setting the plans and procedures for the implementation of all above listed documents for TANAP, EPCM and CCs.

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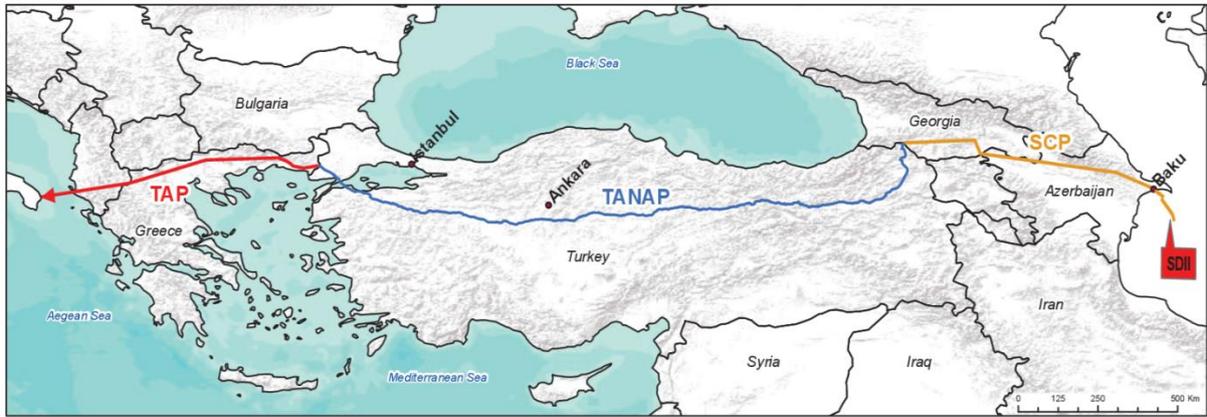
<sup>1</sup> ESMS documentation of TANAP consists of ESIA Report (with generic environmental and social sub-management plans), Biodiversity Action Plan (BAP), Environmental and Social Management Plan (ESMP) covering the Environmental Action Plan (EAP), Environmental Monitoring Plan (EMP), Social Action Plan (SAP), Social Monitoring Plan (SMP), related procedures, and relevant forms. TANAP's ESMS is an umbrella system for any Contractor during performing of the works, supplying materials or providing services for the Project. Each contractor is communicated about the ESMS Documentation of TANAP, during bidding processes and obliged to establish its own ESMS in compliance with the requirements of ISO 14001 and TANAP Project's ESIA Report & BAP. ESIA and BAP processes are presented in further sections of this document.

## 1. BRIEF PROJECT DESCRIPTION

Trans-Anatolian Natural Gas Pipeline (TANAP) Project is part of the Southern Gas Corridor, which aims to transport natural gas from Shah Deniz 2 Gas Field and other fields in the South Caspian Sea to Turkey and Europe in Azerbaijan.

The Southern Gas Corridor comprises the South Caucasus Pipeline (SCP), TANAP and the Trans-Adriatic Pipeline (TAP) as shown in Figure 1.

The TANAP corridor starts from the Georgia/Turkey border at Türkgözü/Posof/Ardahan where it connects to SCP and ends at the Turkey/Greece border in İpsala/Edirne, where it feeds into the TAP Pipeline. There is an off-take station at Eskişehir, Turkey, and another one at Thrace, Turkey to connect to the Turkish natural gas distribution network.



**Figure 1. The site location map showing the southern gas corridor the South Caucasus Pipeline (SCP), TANAP and the Trans-Adriatic Pipeline (TAP)**

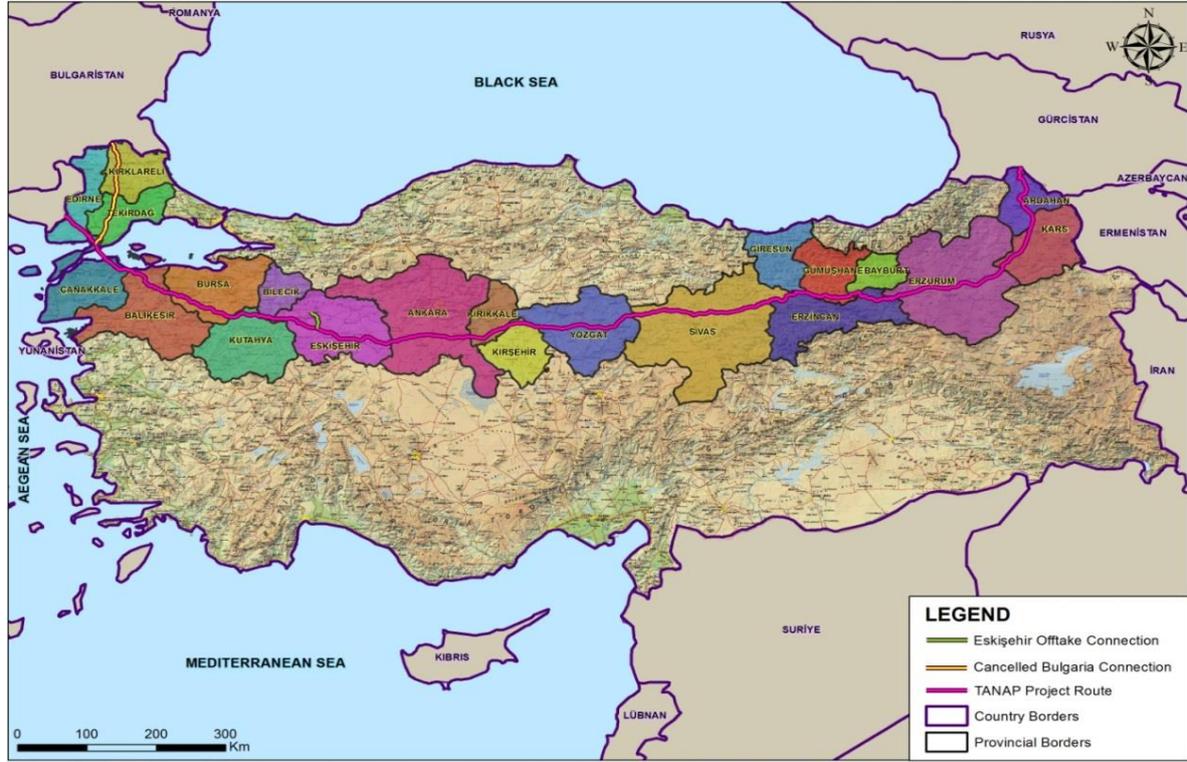
TANAP Project is a 56-inch and 48-inch pipeline system of 1850 km, and will transport natural gas to the required specifications and quantity in stages starting with 16 bcma as initial phase leading up to a high flow case of 31 bcma which is the last phase. 6 bcma will be delivered to BOTAŞ (Boru Hatları ile Petrol Taşıma A.Ş.) to be used within the Republic of Turkey via off-take stations by Gas Transport Agreement (GTA).

The construction of the Project is expected to last for 4 years, and a phased approach will be pursued where the target for completion of the construction and starting operation is by the middle of 2018. The initial capacity of 16 bcma (First Stage) is expected to expand to 24 bcma by 2023 (Second Stage) and to 31 bcma by 2026 (Third Stage), upon construction of the required additional compressor stations.

TANAP is planned to begin from the Georgia/Turkey border and go through the provincial borders of Ardahan, Kars, Erzurum, Erzincan, Bayburt, Gümüşhane, Giresun, Sivas, Yozgat, Kırşehir, Kırıkkale, Ankara, Eskişehir, Bilecik, Kütahya, Bursa, Balıkesir, Çanakkale, Tekirdağ and Edirne.

At the beginning of the Environmental and Social Impact Assessment (ESIA) process the pipeline was planned to be divided into two branches after crossing Marmara Sea and the second branch would pass Tekirdağ and enter Bulgaria through Kırklareli. However, due to the change in the marketing strategy of Azerbaijan, natural gas to Europe by the Bulgarian section was cancelled. The

baseline studies were performed for both sections and the baseline reports include all the results. The cancelled section is indicated with yellow line in Figure 2.



**Figure 2. TANAP Project Route**

The TANAP system will be fully automated with main and back-up control centres to meet the requirements of gas transmissions and associated environmental and safety considerations. The main pipeline facilities include the required number of compression facilities, block valve stations, distribution and custody transfer metering facilities. The pipeline crosses terrain with challenging geotechnical features, including landslides and other geo-hazards, in addition to crossing regions with different levels of urbanization and economic activity.

TANAP, for the purpose of the ESIA Report, includes:

1. Onshore pipeline:

- A main natural gas pipeline from the Turkey/Georgia border to the Turkey/Greece border
- Diameter: 56 inches to the Eskişehir Compressor Station and 48 inches from Eskişehir Compressor Station to the Turkey/Greece border
- Total pipe length: 1850 km
- Onshore length: 1832 km
- Nominal capacity: 31 bcma in high-flow case
- Design Pressure: 95.5 barg
- Main design according to ASME B31.8, 2012.

2. Offshore pipeline section:

- Looping at Marmara Sea crossing

- Diameter: 2 x 36 inches
- Length: 18 km, approximately.

### 3. Compressor Stations:

- 7 compressor stations (2 at First Stage, 2 more at Second Stage, and 3 more<sup>2</sup> at Third Stage) at intermediate points for fulfilling pressure requirements. A separate compressor train is foreseen for the gas supply to BOTAS in CST-5A (identified as CST-5AL).

### 4. Metering Stations:

- 1 custody receiving border metering station at the entry point
- 1 delivery border metering station at the exit point.
- 2 fiscal metering stations at Eskişehir and Thrace Offtakes

### 5. Pig Launcher and Receiver facilities:<sup>3</sup>

- at each compressor station (including phase compressors)
- at each metering station
- at both sides of the shore approaches of the Dardanelles Strait Crossing

### 6. Block Valve Stations:

- 49 in accordance with ASME B31.8, 2012 requirements.

### 7. Off-take Points:

- 2 in Turkey, with metering stations.

### 8. Supervisory Control and Data Acquisition (SCADA) automation, control and Telecommunication equipment:

- Main Control Centre in Ankara, Turkey.
- Back-up Control Centre located with Compressor Station CST-5A in Eskişehir, Turkey

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<sup>2</sup> The ESIA Report includes the first and second stage compressor stations. The third stage compressors stations will be subject to a separate ESIA process and report when the decision for the construction of these compressor stations will be completed.

<sup>3</sup> Intermediate launcher/receiver facilities shall be located along the pipeline route between the compressor stations as required to facilitate effective pigging distances.

## **2. LEGAL REQUIREMENTS AND STANDARDS**

### **2.1. KEY LEGAL, POLITICAL AND INSTITUTIONAL FRAMEWORK FOR ESIA**

Key legal framework and the international standards applicable to the Project were evaluated, defined and followed beginning from scoping phase, implementation, impact assessment and evaluation of the results during ESIA preparation. ESIA Report of the project presents these legal frameworks in detail, whereas it is summarised as follows:

The Intergovernmental Agreement (IGA) and Host Governmental Agreement (HGA) set forth the legal framework upon which the Project has started and has been developed.

"The Intergovernmental Agreement Between the Government of the Republic of Turkey and the Government of the Republic of Azerbaijan Concerning The Sales of Natural Gas To The Republic of Turkey and the Transit Passage of Natural Gas Originating From The Republic of Azerbaijan Across The Territory of The Republic of Turkey and The Development of A Standalone Pipeline For The Transportation of Natural Gas Across The Territory of the Republic of Turkey", was signed in İzmir on 25 October 2011, which was approved by Law no 6349 dated 29 June 2012 and published in the Official Gazette on 12 July 2012.

"Memorandum of Understanding between the Government of the Republic of Turkey and the Government of the Republic of Azerbaijan Concerning the Development of a Standalone Pipeline for the Transportation of The Natural Gas Originating and Transiting from the Republic of Azerbaijan across the Territory of the Republic of Turkey", was signed on 24 December 2011 in Ankara, which was approved by Law no 6342 dated 29 June 2012 and was published in the Official Gazette on 12 July 2012. Following approval by Council of Ministers, the Agreement was published in the Official Gazette on 11 October 2012 and entered into force. Within the framework of this Memorandum of Understanding, Trans Anatolian Gas Pipeline Company B.V was established.

"The Intergovernmental Agreement Between the Government of the Republic of Turkey and the Government of the Republic of Azerbaijan Concerning The Trans-Anatolian Natural Gas Pipeline System", and its attachment, "The Host Government Agreement (HGA) between the Government of the Republic of Turkey and The Trans Anatolian Gas Pipeline Company B.V. Concerning Trans-Anatolian Natural Gas Pipeline System", were signed on 26 June 2012 in Istanbul. These Agreements were approved by Law no 6375 dated 02 January 2013, which was published in the Official Gazette on 17 January 2013. Following approval by Council of Ministers, the Agreements were published in the Official Gazette on 19 March 2013 and entered into force.

The Trans Anatolian Gas Pipeline Company B.V. has transferred its rights and obligations under HGA to TANAP Doğalgaz İletim A.Ş. with the approval of Ministry of Energy and Natural Resources of Turkey. The companies assigned by two countries to form a project-specific joint consortium are SOCAR and the Petroleum Pipeline Corporation (BOTAŞ).

The HGA requires Project Environmental and Social Standards complying with National Laws and also taking due account of international standards and practices

generally prevailing in the Natural Gas pipeline industry, including relevant Performance Standards of the International Finance Corporation.

International Legislation, Standards and Guidelines referred during studies for compliance are Equator Principles, IFC 2012 Performance Standards (IFC 2012 PSs), IFC General Environmental, Health and Safety (EHS) Guidelines, IFC Industry Specific EHS Guidelines, WHO Ambient Air quality standards, WHO Drinking Water standards as well as relevant European Directives on ESIA, protection of nature, pollution control, climate change, air quality, water quality, waste management, noise.

The Turkish legal framework for environmental protection was developed in line with national and international initiatives and standards, and some of them have been revised recently to be harmonized with the EU Directives in the scope of pre-accession efforts of Turkey to the EU. The structure of the Turkish environmental legislation constitutes of primarily the Environment Law, and relevant laws, regulations, by-laws and notifications. The objective of the Environment Law is to protect the environment in accordance with the sustainable development principles. The national legislation relevant to the Project including but not limited to environment constitute the following main headings as water quality, air quality, soil quality, noise and vibration, waste management, energy and climate change, management of chemicals and hazardous substances, health and safety, nature and biological diversity, forestry, soil conservation and land use, agricultural and pasture lands, labor rights, transit transport of petroleum products, expropriation, cultural heritage, shore protection etc.

Legal approval through Ministry of Environment and Urbanization for the ESIA Report of Project was received as of 24 July 2014.

## **2.2. POLICY AND LEGISLATIVE FRAMEWORK FOR LAND ACQUISITION**

TANAP is committed to follow international and national legal policies on land acquisition and resettlement issues for Turkish section in accordance with the HGA. HGA and Turkish laws and legislations govern the acquisition of project affected lands and assets to be obtained through amicable agreements to the best extent. HGA includes provisions to follow measures for land acquisition and social impacts in lien with the applicable operational policies of IFIs.

Primarily, local laws pertaining to land acquisition are Turkish Constitution (Articles 44, 45 and 46), the Law on the Transit Transport of Petroleum through Pipelines (No. 4586), the Expropriation Law (No. 2942) and other supplementary laws such as the Forest Law (No. 6831), the Pasture Law (No. 4342), the Cadastral Law (No. 3402), the Agricultural Reform Law on Land Arrangement in Irrigated Areas (No. 3083), the Law on Soil Protection and Land Use (No. 5403), the Resettlement Law (No. 5543), the Law of Population Services (No. 5490), the Notification Law (No. 7201) and the Land Registry Code. These may be further populated in accordance with the needs arising from the stated laws.

This section summarizes the underlying basic principles of the Land Acquisition process applied during expropriation activities in Turkey according to Expropriation Law. Ministry of Energy and Natural Resources, as being the Designated State Authority (DSA), assigned a Land Rights Entity (BOTAŞ) to execute land acquisition on behalf of the TANAP

Project as per the HGA. BOTAŞ then acquires the Public Interest Decision from the Ministry of Energy and Natural Resources and initiates land acquisition process with parcel based Land Acquisition Decision.

In principle, the local legislation encourages a negotiated process for the acquisition of land and other immovable assets. Accordingly, negotiations are planned and executed based on the unit values calculated by the subcontractor and verified by an independent entity, which are approved by BOTAŞ. In case the landowner applies for negotiations, the landowner is informed about the details of the land acquisition process and the value proposed by the Valuation Commission for the parcel to be expropriated.

In the event that the landowner accepts the land value determined by the commission; the agreement is formally established by a written report. The amount of compensation is deposited into the landowner's personal bank account and the land is registered on behalf of BOTAS within 45 days of the agreement. The landowner may choose not to accept the land value determined by the commission or the landowner may not be able to attend or respond the negotiation for any reason, then the disagreement or non-attendance, respectively, is formally established by a written statement.

Latter case, though not a desired case by TANAP policy, court case (which is called Immediate Expropriation – Article 27) will be/is applied in order to enable land access to the construction contractor as per the construction schedule securing the land rights for the sake of the project. However, still the negotiation and agreement option is open for the landowners or shareholders.

Following the land delivery to the construction contractor through a protocol with the land owner/user witnessed by all related parties to be basis for land exit, court process is continued for Land Registration (Article 10) to settle the title deed records in the name of BOTAŞ and enable the land/shareholders to challenge the land values. As the land entry protocol is signed before the construction takes place in the field, the landowner is informed formally that registration is completed for mutually agreed ownerships, Article 27 compensation is blocked in bank accounts and crop payments are finalised. This stage enables identification of mis/uninformed cases if any; disputes are resolved immediately through submitting necessary documentation.

Since Article 10 is a long duration process, approximately lasting for ideally 6 months but to be extended due to court workload for an unknown period; Article 27 cases are applied and corresponding land values assigned by the court is deposited in the name of the landowners/shareholders for which the landowners are allowed to draw from the bank at any time. Relevant procedure for court case is communicated to each landowner individually prior to construction that compensation is deposited in bank account through court proceedings. Landowners/shareholders are entitled to draw the court decided compensation amount with submitting sufficient documentation (inheritance registration, power of attorney or such) to the bank. This process is valid until finalisation of Article 10 cases. When those are finalised, the land is registered in the name of BOTAŞ and ready for Transfer of Rights to TANAP as defined by the HGA together with registrations through consent.

Acquisition of state lands also follows a similar process. Relevant state authority is contacted for negotiation. In case agreement is reached, applicable land right is established; if not, again court process is established which does not prevent access to land. Lands under the jurisdiction of forest authority, is quite different. Valuation of the forestland is made by the Forest Authorities and payment is deposited in the bank accounts of relevant district authority. There is a down payment followed by annual payments as per increments assigned by the Forest Authority.

Finally, all obtained rights in the name of BOTAŞ will be transferred to TANAP Doğalgaz İletim A.Ş. where the according to article 8/e of the Transit Law (4586).

A RAP Fund has been introduced to the Project as a central mechanism in parallel to land acquisition by which to address the gaps between Turkish legislation requirements and international guidelines with respect to compensating for land acquisition for the pipeline. The RAP Fund has been introduced by TANAP to specifically ensure a fair and transparent valuation and compensation process for the non-eligible users (users that are directly/indirectly affected by the project but can not be compensated through the legal process by BOTAS) during the ongoing land acquisition process. This includes squatters on public lands as well as commonly used lands. Yıldız Technical University, as being the independent consultant to TANAP, reviewed and reworked the compensation methodology and amounts derived by TANAP.

### 3. ENVIRONMENTAL AND SOCIAL RISK MANAGEMENT AND ESMS

This section presents the start of the project with the route selection process considering various risks including environmental and social aspects, followed by the definition of the environmental and social impact assessment process, including the schedule and the results of the baseline studies. The last section demonstrates how the Environmental and Social Management System was organised in TANAP Project with explaining the current integration with EPCM and Construction Contractor's organisational structure, defining the roles and responsibilities of each party. The documentation of EPCM for the management and monitoring of the project, ESMPs of the construction contractors, alignment of the whole documentation with the other Engineering documentation and the communication, reporting structure within TANAP and in between TANAP, EPCM, Construction Contractors and Consultants are presented, as well. The impacts assessment method, results and the mitigations are defined in Section 4.

#### 3.1. DEVELOPMENT OF THE PROJECT, ROUTE SELECTION

The objective of routing for TANAP Project was always the identification of a technically feasible pipeline centreline, with a reasonably low impact on environment and land use. The route development process has taken into consideration several route corridor alternatives and applied technical routing criteria; as well as a pre-assessment of the route alternatives' environmental / social impact potentials to select a route corridor which, due to its more favourable properties, was identified as the "Preferred Route" as shown in Figure 3. Currently, no physical displacement is expected.



**Figure 3. TANAP Project Route**

The preferred route corridor is selected based on the following criteria:

- Minimize traversing areas of difficult constructability such as steep slopes; high elevations, or rocky terrain;
- Minimize overall pipeline length;
- Minimize the crossing length through the Marmara Sea;
- Be in proximity to transportation infrastructure to lessen impacts from road or other additional construction;
- Minimize environmental and social impacts;
- Minimize impacts to cultural/archaeological sites;
- Avoid areas where unstable ground or other geohazards have been identified;
- Avoid proximity to settlements and populated areas;
- Minimize the impact on important agricultural lands;

- Minimize security risks;
- Minimize crossing of existing and/or planned state authority infrastructure;
- Minimize total cost.

The workflow of the route selection process for the TANAP Project is presented in

Figure 4.

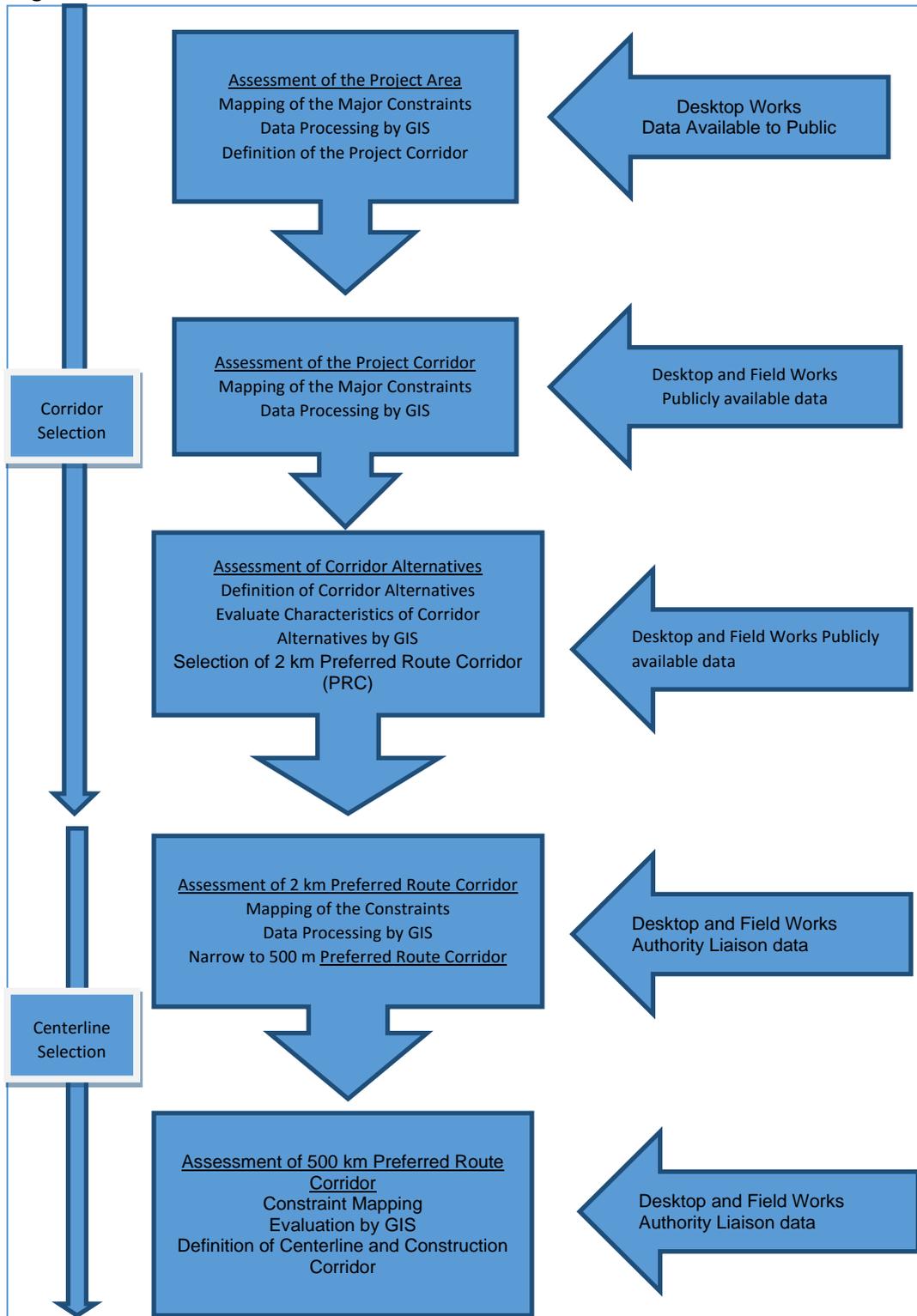


Figure 4 Route Selection Process Workflow

A project area/corridor assessment process was performed through a high level identification of the major constraints and a subsequent evaluation of alternative route corridors. The purpose was to narrow the project area, which initially covered the northern and central part of Turkey, to an approximately 70-150 km wide project corridor. Finally, a 2 km wide preferred route corridor was determined between the entry/exit points at the Georgia, and Greece borders and Turkey's off-take location in Eskişehir taking all the below considerations into account:

- General Topographical Properties,
- Soil Properties,
- Land Usage Status,
- General Geological-Geomorphologic Properties,
- Stratigraphy,
- Engineering Properties of the Rock Units,
- Fault Lines and Seismicity,
- Areas with Potential Geological Risks (Erosion, Landslide, Elevated Ground Water Layers and Aquifers, Karstic Zones),
- Hydrological Properties,
- Ecological Properties (Protected Areas (National Parks, etc.), Sensitive Habitats, Forests, Scrublands, Meadows-Pastures and Wetlands),
- Archaeological Properties,
- Tangible and Intangible Cultural Heritage,
- Socio-Economic Properties (Demographics, Economic Properties),
- Existing and/or planned state authority infrastructure(s)

The selection of the preferred pipeline route for TANAP was performed during the summer/fall of 2012.

Consequently, the route experienced changes based on the aforementioned reasons for optimization during Front-End Engineering Design (FEED) and Detailed Engineering phases. The revision dates of the routes and the route alternatives are given in Table 1.

**Table 1 Dates of Route Revisions**

Route	Date
ESIA Route Corridor	September 2012
500 m Route Corridor for ESIA	November 2012
TANAP Project KP's & Route Alternatives	December 2012
Preferred Route Rev C	March 2013
Preferred Route Rev D	May 2013
Preferred Route Rev E	May 2013
Preferred Route Rev F	July 2013
Preferred Route Rev G	December 2013
<b>Approved ESIA Corridor</b> Preferred Route Rev H	January 2014
Preferred Route Rev J	January 2015

The change management process within TANAP is being implemented for the changes accepted after the Route Rev H, which was the approved ESIA Corridor. Client Advice

Notice (CAN) and Action Advice Notice (AAN) procedures are used in between TANAP and Engineering, Procurement, Construction, Management Contractor (EPCM) for the evaluation of the route changes in which they implement Environmental and Social Checklist/Assessment with respect to 500 m corridor as stated in Environmental Management of Change procedure of TANAP. Approved route changes are registered in the alignment sheets and shared with the construction contractors (CCs) for implementation.

The average width of the Right of Way (RoW) is planned to be 36 m in accordance with the standard international pipeline construction criteria to enable depositing of the topsoil and subsoil within the construction footprint and to allow safer and more efficient access to the construction works.

RoW width may be decreased or increased taking into account particular site conditions, such as wetlands, marshes, areas with side and steep slopes, agricultural fields, etc. For instance, RoW may need to be widened because fertile topsoil and subsoil need to be deposited separately in certain agricultural areas.

At road, railway, or river crossings, RoW may need to be widened because the construction activities involve specialized large boring equipment that requires a bigger work area and the documents of engineering phase are prepared in line with these requirements. Similarly, RoW has been widened in rocky areas that require blasting, wetlands that require exceptional drainage, or areas that require special construction techniques due to soil characteristics.

The most important component in determining the width of RoW is allowing for the construction activities to be carried out safely and to minimize the environmental and social impacts.

Although it is possible to narrow the RoW for short distances, it is not possible to decrease the width less than 30 m along the whole line because of safety, security, and technical feasibility conditions.

Using a 36 m standard RoW width provides the following advantages:

- Conducting the studies according to international standard pipeline construction methods;
- An area provided that enables construction activities in line with proper health and safety principles;
- Easy access to construction areas in case of an emergency;
- Minimizing the possibility for constructors to exceed RoW excluding the exceptional cases where land owners are paid for compensation;
- Providing that the temporary deposition of fertile topsoil and subsoil are separate in suitable conditions and hence the environmental or agricultural impacts are minimized.

For the pipeline route an Unrestricted and Exclusive Right has been established for 16m wide corridor (8m each side of the axis) and an additional temporary easement has been established for 20m along the pipeline route. Permanent land acquisition is being implemented for Above Ground Installations (AGIs).

### 3.2. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT PROCESS

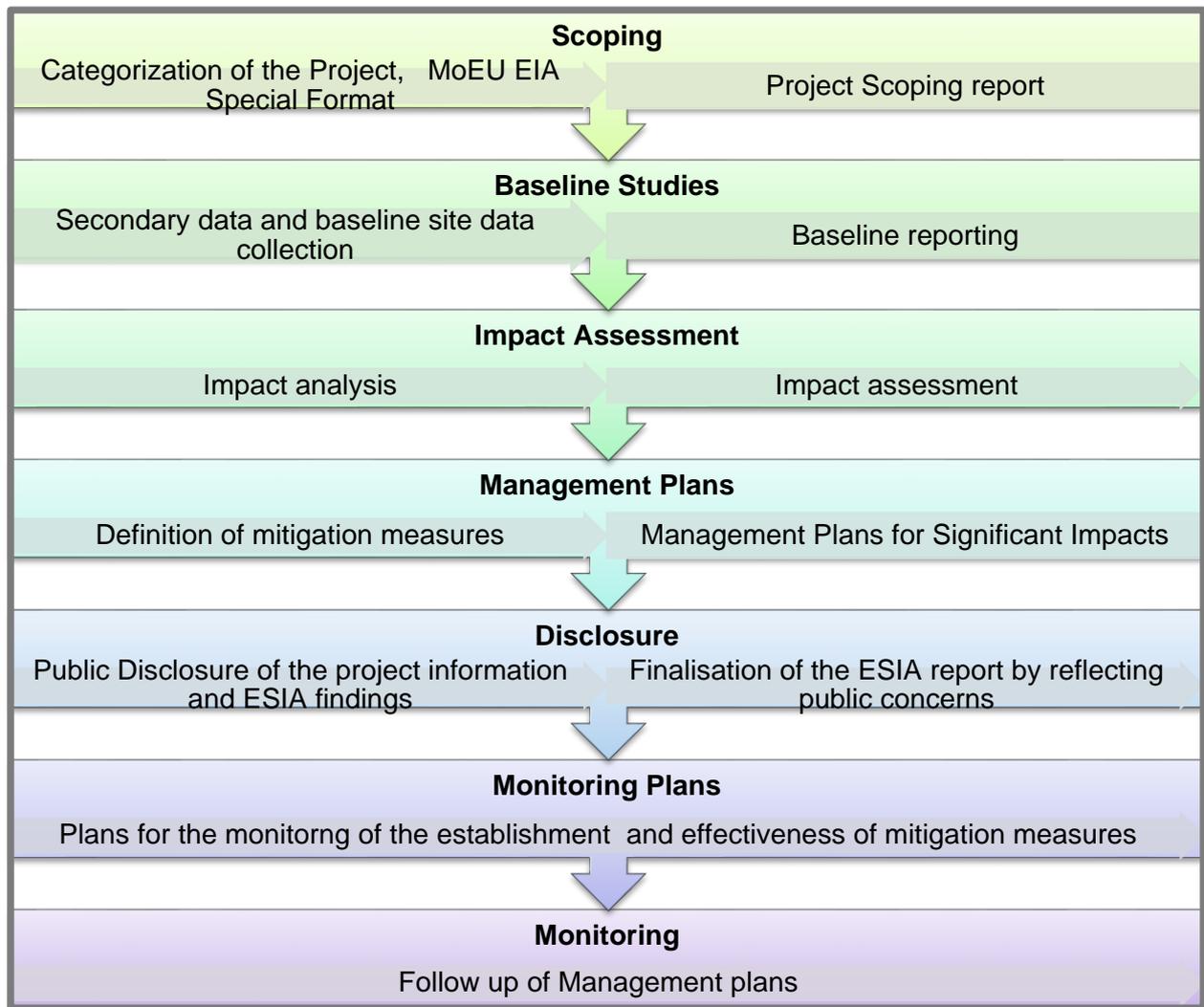
Golder Associates S.r.l and Golder Associates Ltd. Şti., collectively referred to as Golder, worked together as a global ESIA consultant for TANAP, who has also prepared the methodology for Baseline studies for local ESIA Consultant Çınar (Çınar Mühendislik Müşavirlik A.Ş.), in order to be in compliance with International Framework as described in the above sections. In addition impact assessment methodology was set and the impact assessment, as well as the cumulative and transboundary impact assessment were conducted by Golder. The general methodology used by Golder for Environmental and Social Impact Assessment Studies is based on the Drivers-Pressures-State-Impact-Response (DPSIR) Framework developed by European Environmental Agency (EEA) which has been designed to be a highly transparent and a semi-quantitative analysis of the impacts on the various environmental and social components through the life cycle of the project. The GIS based methodology of Golder used in the environmental and social impact assessment of the project is summarized in Annex 5.

TANAP has checked, commented and approved during each phase of ESIA process. Final quality control was conducted by ERM after TANAP comments were also incorporated.

The ESIA studies were started in the middle of 2012 including the route selection and determination process as stated in the above section 3.1. An integrated approach with the aim of meeting all national regulatory requirements and, in addition, of meeting the requirements of the relevant International Finance Institutions (IFIs) was followed during the ESIA process that was initiated in order to evaluate the environmental impacts of TANAP Project according to the Regulation on Environmental Impact Assessment which was issued on the Official Gazette dated 17 July 2008 and numbered 26939.

The ESIA documentation was subject to the review of the competent Turkish authorities to assess the compliance with requirements applicable to the Project. Stakeholder engagement and consultation with public was performed continuously to identify their concerns on the Project and to reflect these concerns into the ESIA process.

ESIA process for the TANAP Project is summarized in Figure 5, which was started in mid-2012.



**Figure 5 ESIA Process Chart**

During the scoping phase a scoping report has been prepared for the Project in line with IFI requirements.

The Ministry of Environment and Urbanization has defined the Special Format for the Project on 29 March 2013 after the completion of Public Participation Meetings held between the dates 25 February – 11 March 2013 in 21<sup>4</sup> provinces in total.

Within the scope of the ESIA study of the TANAP Project, first data on the Baseline Study Areas were collected aiming to determine the existing physical, biological and social status. Desktop studies in this phase were based on the publicly available data such as Database of Turkish Institute of statistics, Reports of State Hydraulic Works, City Based Environmental Status Reports etc.

<sup>4</sup> After cancellation of second branch to Bulgarian Border, number of provinces was decreased to 20.

The Baseline Study Areas were based on the likely area of influence (AoI) of the Project in which a direct or an indirect impact on the physical, biological and social components might occur.

These areas were spatially identified for the environmental and social components as given in below Table 2:

**Table 2 Environmental and Social Components in AoI**

<b>Physical Onshore Components</b>	<b>Physical Offshore Components</b>
Meteorology and climatology, Air quality Geology and geomorphology, Seismology , Soil Hydrology and surface water quality Hydrogeology and groundwater quality Noise and vibration Visual aesthetics	Bottom morphology & Sediments Seismology Sea water Physical oceanography Noise and vibration
<b>Biological Onshore Components</b>	<b>Biological Offshore Components</b>
Terrestrial flora Terrestrial fauna Freshwater flora Freshwater fauna Terrestrial habitats and ecosystems Freshwater habitats and ecosystems Biodiversity Protected areas	Marine flora Marine fauna Marine habitats and ecosystems Marine biodiversity Marine protected areas
<b>Onshore social components</b>	<b>Offshore social components</b>
Infrastructure Education Land Use Demographics (Population) Economic Conditions Employment Health (Including Health Facilities) Cultural Heritage and Archaeology Industry	Infrastructure Education Land Use Demographics (Population) Economic Conditions Employment Health (Including Health Facilities) Cultural Heritage and Archaeology Industry

***During physical baseline data collection:***

Data collection for the description of the current conditions of the physical environment was performed. The sampling locations were defined considering the potential impacts of the Project at these locations depending on their distance to the pipeline and current sensitivity.

- ✓ PM-10 and PM-2.5 sampling was performed at a total of 162 points selected. Samplings were conducted by Çınar Laboratory during July, August and September 2013 and March and May of 2014.
- ✓ SO<sub>2</sub>, NO<sub>x</sub>, and O<sub>3</sub> sampling was performed at a total 40 points in May, August, October 2013 and February 2014 by Çınar Environmental Laboratory.
- ✓ Noise and vibration measurement was performed at a total 69 points. The field studies were conducted in May and July-September, 2013 and March and May, 2014 by Çınar Environmental Laboratory.
- ✓ Field studies for baseline soil contamination has been conducted in September, October and November 2013 and May 2014 at 105 sampling stations by Çınar Laboratory.
- ✓ For the wet season (spring/May 2013) and dry season (summer/July) 327 and 218 sampling points were determined for surface water quality measurements. (please refer to some sample photos as photo 1 and 2 for surface water sampling at site during wet season)
- ✓ Groundwater sampling was conducted at 37 locations in June-October 2013 and February 2014.



**Photo 1 Kızılırmak-Kırıkkale- Surface water sampling    Photo 2 Sakarya Haymana- surface water sampling**

**During biological baseline data collection:****TERRESTRIAL & FRESHWATER:**

- ✓ A total of 246 sampling stations were visited / chosen for terrestrial flora studies, 87 SCC,
- ✓ A total of 43 sampling stations were visited / chosen for aquatic flora studies, no SCC,
- ✓ A total of 133 sampling stations for mammals, five SCC,
- ✓ A total of 152 sampling stations for birds, two SCC and five potential SCC,
- ✓ A total of 133 sampling stations for reptiles, four SCC and seven potential SCC,
- ✓ A total of 133 sampling stations for amphibian species, one potential SCC,
- ✓ A total of 243 stations for terrestrial invertebrates, 34 SCC,
- ✓ A total of 12 high sensitivity habitats, which are defined in accordance with National Biological Diversity Strategy and Action Plan<sup>5</sup> (Please refer Annex 3).
- ✓ A total of 189 sampling stations for freshwater fish and macroinvertebrates studies, 13 SCC fish species and one potential SCC macroinvertebrate were identified as a result of the field studies and literature analysis.

These studies were conducted by a group of specialists coordinated by local ESIA Consultant, Çınar, on terrestrial flora and fauna, freshwater flora and fauna in May-June 2013 (according to Turkey climate May to June for west part of Turkey, July to August for east part of Turkey)

Among the various endemics identified along the route following new species to science were identified as arthropods; *Chrysolina n. sp.*, *Tipula n. sp.1* (pls. see photo 3), *Dioctria n. sp. 1*, *Dioctria n. sp. 2*, *Muzimes n. sp.*, *Hilara n. sp. 1* (pls. see photo 4), *Hilara n. sp. 2*, *Hilara n. sp. 3*, *Hextoma n. sp.*, as flora; *Verbascum sp. Nov.*



**Photo 3 *Tipula n. sp.1***



**Photo 4 *Hilara n. sp. 1***

<sup>5</sup> MINISTRY OF ENVIRONMENT AND FORESTRY, 2007, The National Biological Diversity Strategy and Action Plan. General Directorate of Nature Conservation and National Parks. Department of Nature Conservation. National Focal Point of Convention on Biological Diversity.

**MARINE:**

- ✓ A total of 45 fishermen surveys for marine mammals and turtles studies, four potential SCC, no breeding area;
- ✓ A total of 6 sampling stations were visited / chosen for marine fish studies, no SCC or their breeding area;
- ✓ A total of 17 sampling stations were visited / chosen for marine soft bottom macrobenthos and marine flora studies, 11 sampling stations were visited / chosen for marine hard bottom macrobenthos, no SCC were identified as a result of the field studies and literature analysis.

***During social baseline data collection:***

Social Baseline Studies were conducted to obtain updated and sound socio-economic data about potential Project-affected settlements as well as to identify any possible concerns and feedbacks of the local communities regarding the Project. These activities represented an important opportunity to collect baseline information from stakeholders as well as to inform them on the Project, allowing them to express opinions and comments. Surveys were conducted in five main forms:

- Key informant interviews - A total of 151 interviews
- Focus groups meetings - A total of 307 meetings (pls. see photos 5&6)
- Questionnaires to settlement heads - A total of 396 questionnaires (pls. see photo 7)
- Questionnaires to households - A total of 2253 questionnaires
- Phone surveys - A total of 117 calls



**Photo 5 Focus Group Meeting with Young People**



**Photo 6 Focus Group Meeting with Women**



**Photo 7 Questionnaire surveys**

### **3.3. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM (ESMS)**

TANAP has established an ESMS in order to meet national and international standards and best practices as well as to assure appropriate management of environmental and social risks that could compromise the efficiency of project development and execution. TANAP and its Contractors of each level from management to third party monitoring services and from implementation to logistics and procurement are responsible for the development and implementation of their own environmental and social management systems (ESMS). The systems ultimately have the aim of ensuring that:

- The Project meets its legal and other Project requirements;
- The Project Environmental and Social aspects are identified and potential impacts are controlled (or enhanced in the case of positive impacts) as far as possible and as per Project commitments which are presented in the Appendix 4.7 of the ESIA Report; and
- The Project demonstrates continual improvement in its environmental and social management.

TANAP's ESMS documentation establishes and maintains information to describe the core elements of the management system and their interaction. ESMS documentation of Project is managed (created, tracked, stored and maintained) in accordance with document control plans and procedures of the Project.

The core ESMS documentation of TANAP consists of ESIA Report, Biodiversity Action Plan (BAP), Environmental and Social Management Plan (ESMP), Environmental Action Plan (EAP), Environmental Monitoring Plan (EMP), Social Action Plan (SAP), Social Monitoring Plan (SMP), Resettlement Action Plan (RAP) related procedures, and relevant forms.

The ESIA Report forms the basis for the environmental and social management system of construction, operation and decommissioning phases of the Project. It reflects the Project's environmental and social aspects and impacts and the respective mitigations throughout the entire project life cycle. The "Environmental and Social Management Plan" (TNP-PLN-ENV-GEN-001) explains general approach of environmental and social management system of Project and how the principles of ISO 14001:2004 are applied. The ESMP is revised and reissued periodically to reflect the current status of environmental and social management system and its documentation. Environmental Action Plan (TNP-PLN-ENV-GEN-002) and Social Action Plan (TNP-PLN-SOC-GEN-002) outline how TANAP manages the requirements of ESIA for engineering, procurement and construction processes, such as defining the third party monitoring services, internal and external audit processes, compliance checks. Environmental Monitoring Plan (TNP-PLN-ENV-GEN-003) and Social Monitoring Plan (TNP-PLN-SOC-GEN-00) ensure that the appropriate monitoring requirements for environmental and social are implemented regarding the Project requirements.

The roles and responsibilities of TANAP, EPCM contractor, Construction contractors and third party ESIA monitoring consultant as per ESMS are briefly described in Table 3 below.

**Table 3 Roles and Responsibilities of TANAP, EPCM Contractor, Construction Contractors and Third Party ESIA Monitoring Consultant**

TANAP Environmental and Social Teams	<ul style="list-style-type: none"> <li>• Fully responsible for ensuring that the environmental and social Project requirements, goals and objectives are met and being operated in accordance with the project ESMS.</li> <li>• Fully responsible for organizing, managing and monitoring the environmental and social activities in the scope of TANAP Project.</li> <li>• Review and approve the ESMS of each Contractor, involved in the TANAP Project, including EPCM.</li> <li>• Monitor performance through review of information provided by EPCM (through Key Performance Indicators (KPIs), reports, etc.), audits, and meetings.</li> <li>• Ensure that third party monitoring of project activities are conducted.</li> </ul>
EPCM Environmental and Social Teams	<ul style="list-style-type: none"> <li>• Manage and monitor the implementation of TANAP's Environmental and Social Requirements for the Contractors, all other commitments in ESIA and ESMS components within the scope of EPCM activities.</li> <li>• Reviews and approves E&amp;S documentation of Contractors that are under the supervision of EPCM.</li> </ul>
Contractor Environmental and Social Teams	<ul style="list-style-type: none"> <li>• Responsible for the development and the implementation of their own ESMS in compliance with TANAP's Environmental and Social Requirements for the Contractors and all relevant ESIA commitments</li> </ul>
Third party ESIA monitoring consultant	<ul style="list-style-type: none"> <li>• Monitors quarterly the implementation of the commitments and mitigations of the ESIA Report as a legal requirement of MoEU and daily as per TANAP technical scope of work, which was set forth within the Environmental Monitoring Plan of TANAP. In addition, during monitoring, reviews the specific documentation prepared both by EPCM and CCs, for the implementation of ESIA commitments and then reports the non-compliances with daily reports as well as within weekly and monthly reports, officially to TANAP.</li> </ul>

The organization charts depicting environmental and social teams of TANAP, EPCM Contractor and Construction Contractors are given in Figures 6 and 7. This structure will be enlarged with the Contract award of the other sections of the pipeline such as Stations, Off-shore etc.. Figure 8 presents the overall algorithm of the ESMS of TANAP Project.

Environmental and social management guidelines for Contractors, in general, as defined further in Section 3.3.1, such as pollution prevention plan, community safety plan, are the documents/sub-plans explaining how environmental and social issues of specific concern are managed by TANAP and its Contractors and set out in broad terms how TANAP intends to manage these specific issues. These sub-plans were prepared within the ESIA Report considering the impact assessment results, commitments, as well as the confronting mitigations. During the ESMS set up phase, these sub-plans become a part of the Environmental and Social Action Plans as a Guideline for Contractors. EPCM, has a management role and responsibility to have the TANAP Project requirements being implemented. After the contract award, Contractors prepare their own site-specific environmental and social management plans in line with the requirements set in TANAP E&S generic management plans to perform their Contractual obligations. The Contractors' management plans are subject to TANAP approval.

Procedures relate to management controls for handling key environmental issues and contain details in terms of how an activity is undertaken, who does it, when it is done and what records are generated as a result of conducting the procedure. Procedures are developed and diversified as the system is improved. Contractors develop their own procedures pursuant to Contracts and submit to TANAP for approval.

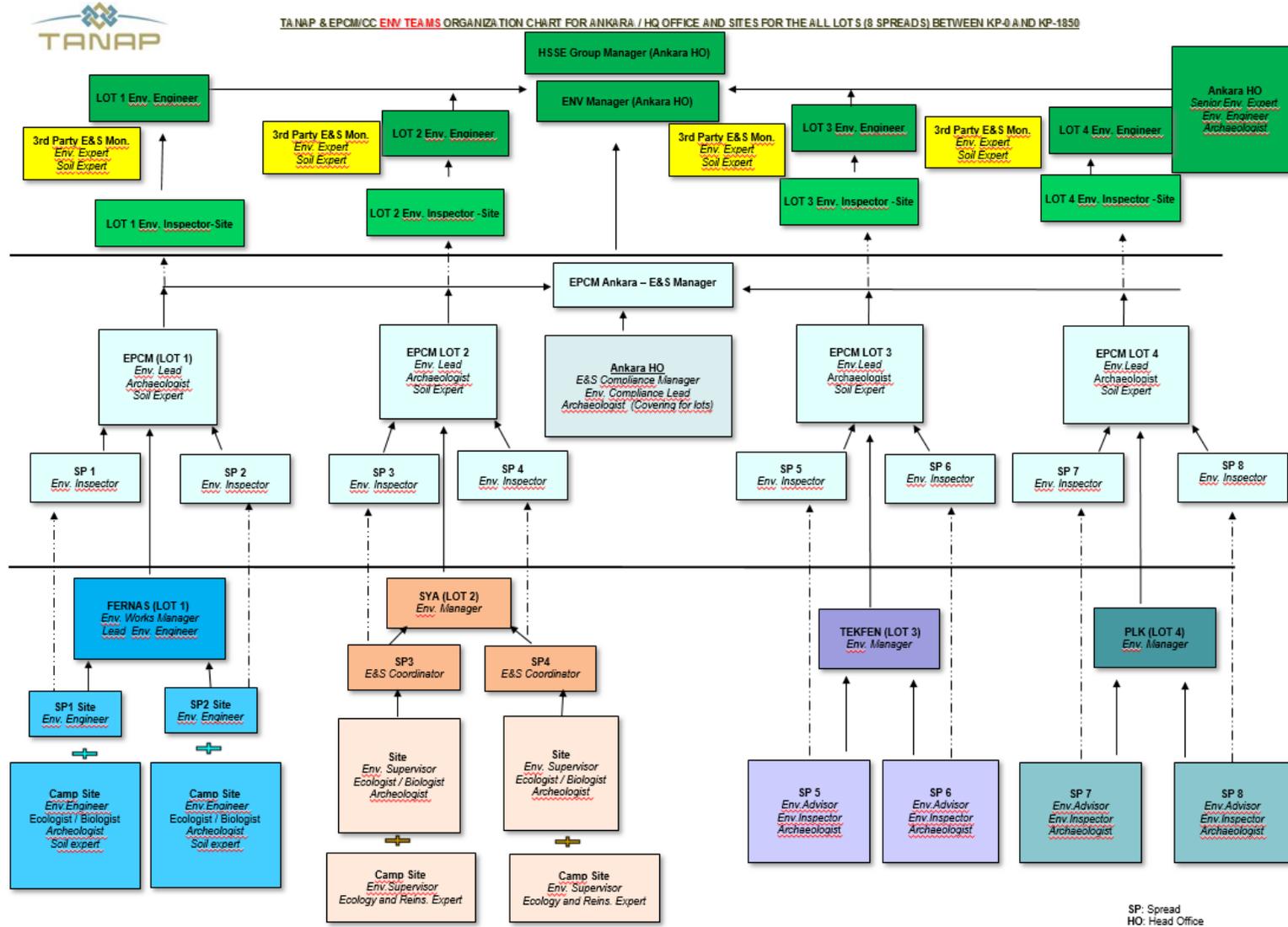


Figure 6 Organization Chart for Environmental Teams of TANAP, EPCM Contractor and Construction Contractors

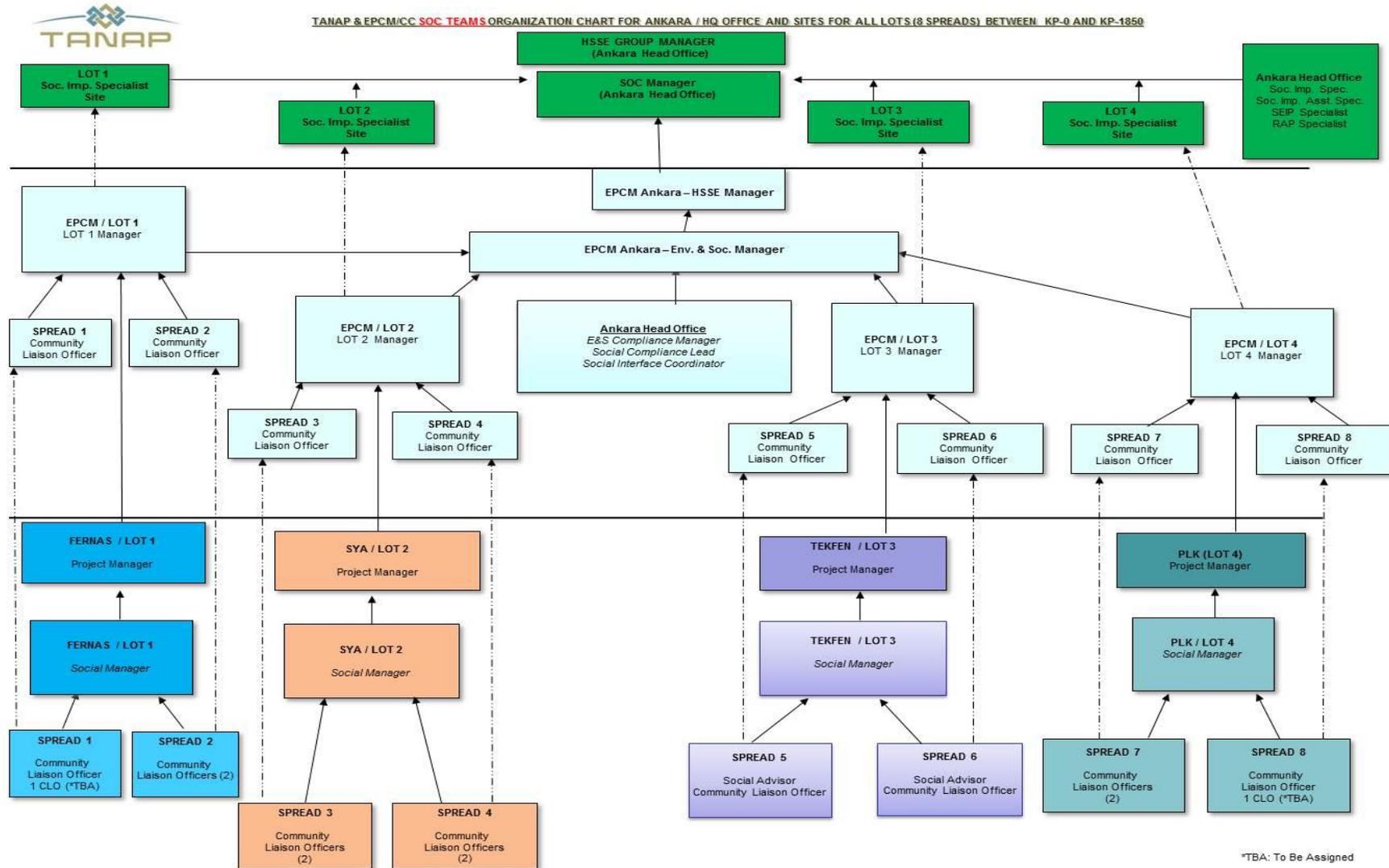


Figure 7 Organization Chart for Social Teams of TANAP, EPCM Contractor and Construction Contractors

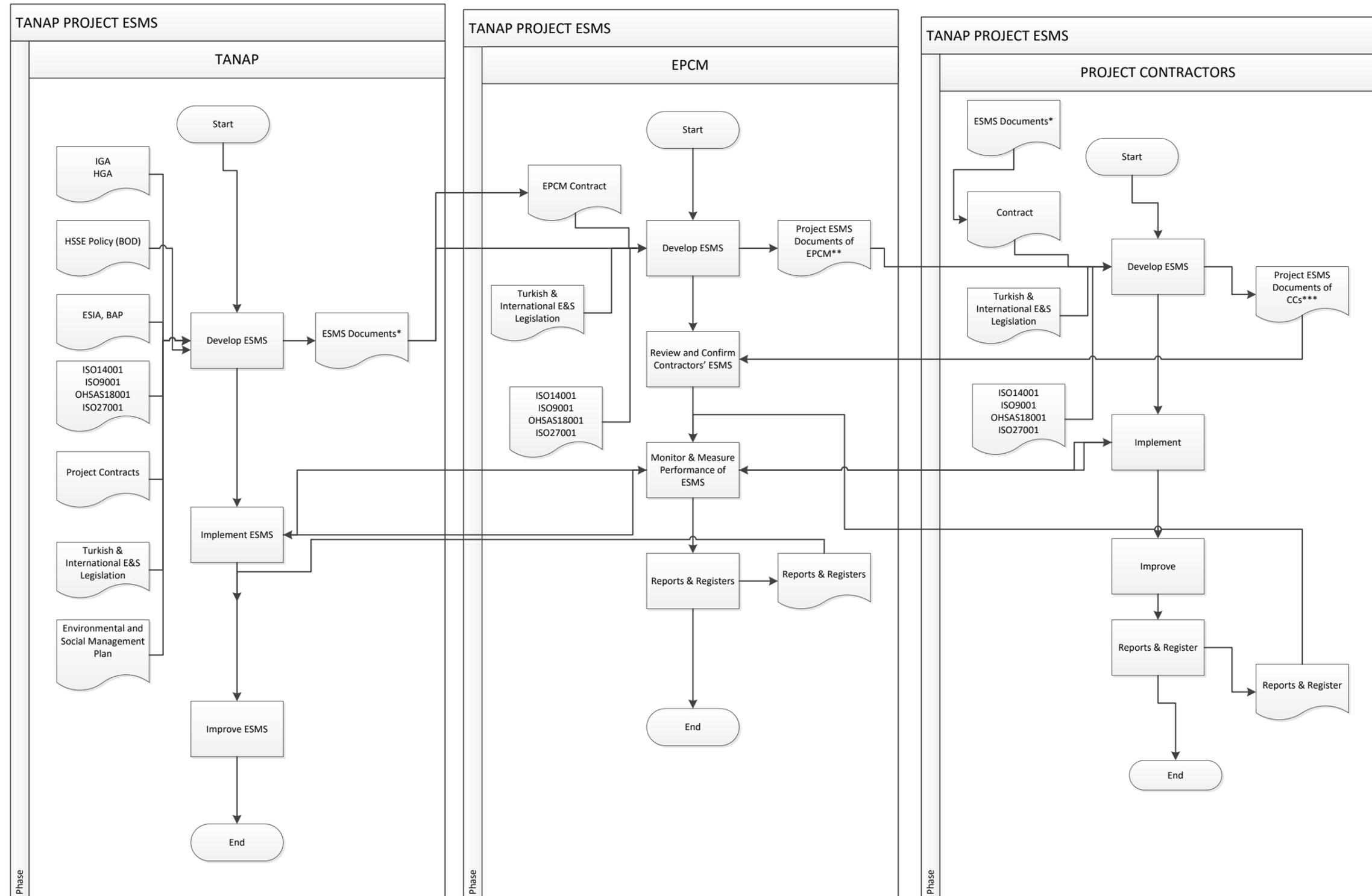


Figure 8 The overall algorithm of the ESMS of TANAP Project<sup>6</sup>

<sup>6</sup> ESMS Documents: ESMS documentation of TANAP consists of ESIA Report, Biodiversity Action Plan (BAP) Report, Environmental and Social Management Plan (ESMP), Environmental Action Plan (EAP), Environmental Monitoring Plan (EMP), Social Action Plan (SAP), Social Monitoring Plan (SMP), related procedures, and relevant forms.

\*\* Project ESMS Documents of EPCM: Environmental and Social Management Plan of EPCM and relevant procedures, specifications

\*\*\* Project ESMS Documents of CCs: Environmental and Social Sub-management Plans for the implementation of the requirements, commitments and mitigations of ESIA Report & BAP: Construction Impacts Management Plan, Community Safety Management Plan, Community Relations Plan, Employment and Training Plan, Procurement and Supply Management Plan, Aggregates Management Plan, Traffic Management Plan, Cultural Heritage Management Plan, Erosion, Reinstatement and Landscaping Plan, Pollution Prevention Plan, Waste Management Plan, Emergency Response Plan

### 3.3.1. Environmental and Social Management Guidelines for Contractors

Under the umbrella of TANAP ESMS, which is defined in Section 3.3, sub-plans are developed as key components, required for managing the environmental and social aspects during the TANAP Project's design, construction and operation phases. These include both the environmental and social components affected by the Project and specifically the affected construction corridor and the Project Aol and the supply chain depending on site specific requirements. These plans presented as follows are first prepared within the ESIA reflecting the mitigations required based on the impact assessment requirements and authority commitments:

- Construction Impacts Management Plan
- Community Safety Management Plan
- Community Relations Plan
- Employment and Training Plan
- Procurement and Supply Management Plan
- Aggregates Management Plan
- Traffic Management Plan
- Cultural Heritage Management Plan
- Erosion, Reinstatement and Landscaping Plan
- Pollution Prevention Plan
- Waste Management Plan
- Emergency Response Plan

TANAP's Environmental and Social Management Plan (TNP-PLN-ENV-GEN-001), Environmental Action Plan (TNP-PLN-ENV-GEN-002), Social Action Plan (TNP-PLN-SOC-GEN-002), Environmental Monitoring Plan (TNP-PLN-ENV-GEN-003), Social Monitoring Plan (TNP-PLN-SOC-GEN-00) together with the ESIA Report and the sub management plans given above also form a framework for ESMS of EPCM and construction contractors. In this respect, with the handover of the project, EPCM and CC's formed their own Environmental and Social Management Systems with respect to ESIA Report and TANAP ESMS documentation, as well as ISO 14001 requirements. These ESMS have been approved by EPCM/TANAP before site mobilization. Additionally, Biodiversity Action Plan (BAP), which is explained in Section 4.3 of this Executive Summary, has been prepared and shared with both EPCM and Contractors as a complementary documentation to ESIA. BAP is also adopted to the ESMS of TANAP Project, and it is incorporated both within the ESMS of EPCM and Contractors.

EPCM, as a supervision and monitoring unit on behalf of TANAP, ensures that all design, procurement construction and operation related mitigations stipulated by ESIA Report and the above sub management plans are adequately integrated into the engineering, procurement, construction and operation plans and procedures and all other related documentation of the Project.

Contractors' own procedures defined in their ESMS required for controlling environmental and social commitments including NCR procedure and Incident procedure are prepared in accordance with the relevant EPCM/TANAP plans and procedures. In addition, CCs are responsible for preparing Method Statements in order to define the mitigations required for some site specific cases such as some road crossings, river crossings, steep slopes, RoW clearing and grading, and site specific reinstatement or erosion control. These Method Statements are also subject to approval of EPCM/TANAP.

In addition to the package submitted to Contractors during bid phases including ESIA Report, BAP Report and ESMS documentation of TANAP, Contractors' site specific environmental and social plans should address the following groups of issues:

- Flora and Fauna (Construction impacts management plan) – identification of measures to be taken to minimize potential impacts on the biological environment; outline management actions to reduce loss or alteration of ecologically sensitive areas; define seasonal construction periods; etc.
- Waste Management – including the identification of waste streams and management actions including minimization, recycling, collection, storage, treatment and disposal of waste which is generated during site preparation, construction and pre-commissioning phases of the project.
- Pollution Prevention – including the actions to manage and monitor impacts to air, land, and water, and also manage/monitor noise and vibration impacts.
- Water Management - including the identification of the project water sources such as surface water and groundwater, and management actions associated with Project industrial and domestic water use, as well as the minimization and control of use, and the recycling, treatment and disposal of water which is used and generated during site preparation, construction and pre-commissioning phases of the project.
- Erosion Control and Reinstatement - aims at preventing, minimizing and controlling the production of sediments during the construction activities, through design and defines adequate erosion control and management during construction, as well as ensuring an

adequate reinstatement and rehabilitation of the area and of its original landscape characteristics.

- Aggregate Management - identify estimated quantities and possible sources of aggregates as well as potential impacts and recommendations for impact mitigation.
- Greenhouse Gas Emissions – aim to decrease GHG emissions throughout the construction period and provide input into TANAP's carbon footprint measuring and monitoring tool.
- Traffic Management – addressing traffic safety, traffic planning and management of environmental issues (dust, vibration) associated with heavy traffic.
- Cultural Heritage Management – ensure avoidance of significant impacts on cultural and archaeological resources within the project area and protect late find through implementation of the procedure for chance findings during the construction and land preparation phases.
- Emergency Response - define the actions and procedures which are implemented to prevent emergencies and/or to respond in a planned manner to minimize the respective potential damages owing to emergencies, including spill response.
- Camp Management – aim to define the management of the camp activities.
- Community Relations - aim to build and consolidate relationships with all stakeholders (involving people, institutions, groups and other stakeholders who may be affected by the Project) during the site preparation, construction and pre-commissioning phases of the Project.
- Community Safety- aim to reduce any project impacts on the safety of local residents due to project activities during the site preparation, construction and pre-commissioning phases of the project, with specific focus on community safety awareness and training of workers.
- Worker Management – aim to address the mobilization of workers, recruitment strategy/plan, recruitment procedure, contracts, HR policies, communication, retrenchment and training.
- Procurements and Supply –aim to maximize the local supply of products and services to be used during the site preparation, construction and pre-commissioning phases.

### **3.3.2. Alignment of Environmental and Social Management System Documentation with other Engineering documentation**

The Project changes and the changes in key control documents which impact the conditions and commitments stated in approved ESIA documentation are subject to Environmental Management of Change procedure of TANAP (TNP-PCD-ENV-GEN-002) of which has

been one of the main documents shared with EPCM to be implemented during Project activities.

This procedure is applied when:

- Engineering/Design changes
- Route/location changes
- Applicable legislation changes related to environmental issues
- Authority provision changes
- Any new environmental/social data is introduced
- Construction/operation strategy changes
- TANAP's policies and strategies change
- Stakeholders influence the project

The Facilitator of the Change ensures that the Environmental Department is informed of any change, as specified above, which could have a potential environmental impact and which could cause a deviation from the approved ESIA Report.

ESMS of EPCM has set the system for the environmental management of change process, regarding the TANAP Environmental Management of Change Procedure. If the proposed change, such as using a camp site which is not proposed as one of the alternatives in the ESIA Report, is arriving from Construction Contractors, environmental and social aspects are evaluated by them, regarding the environmental management of change system requirements and presented to the approval of EPCM/TANAP as well as to the authority approval. If the change is proposed by EPCM/TANAP, then internal processes; Client Advice Notice (CAN) and Action Advice Notice (AAN) procedures defined in Section 3.1 are used in between TANAP and EPCM for the evaluation of these changes, in which Environmental and Social Checklist/Assessment is implemented and the additional mitigations can be referred, if required such as the preparation of Environmental and Social Assessment reports, monitoring of Archaeologists, CH mitigations etc.. Approved changes are registered in the alignment sheets and shared with the construction contractors (CCs) for implementation. Alignment sheets have been produced by EPCM and checked/approved by TANAP for the whole pipeline route. These sheets presents information on environmental-cultural heritage restrictions, construction constraints, bioremediation and slope breaker notes or refer to related technical specifications etc.

Alignment sheets are revised and re-issued to be implemented during construction, wherever it is required.

The progress of the Construction has been followed-up by March Charts which are prepared by Construction Contractors in which environmental and archaeological constraints are also incorporated as well as the other items. ESIA Report findings and the BAP report results are reflected on these charts such as CHs, closed construction period, river crossings etc. These March charts demonstrates the schedule of Construction considering each activity in a given time frame by the contract.

As stated in above paragraphs, these documentation are all subject to approval of EPCM/TANAP.

EPCM reviews and checks the environmental documents from CCS to verify that these meet the environmental requirements included in respective Project Contracts. Throughout the design phases, EPCM verifies that all design safety aspects are reviewed and included by design contractors.

In addition as per the scope of services of EPCM; EPCM ensures that each Project Contract sets out the respective obligations and undertakings of the Project Contractor as far as applicable including the requirements for Health, Safety, Security and Environmental (HSSE) protection to be adhered to by the Project Contractors and the requirements for Project Contractor bidding and procurement.

TANAP has established the following communications methods to improve the coordination and communication among the other disciplines and also within the environmental and social teams as given in Table 4.

**Table 4 Communication among TANAP disciplines**

Communication type	Subject of the Communication	Participants
TANAP Weekly Social and Environmental Team Meetings	Environmental and social issues are discussed in these meetings within the respective teams.	TANAP Environmental Manager, Lead Environmental Engineers, Environmental Engineers in Ankara Office.  TANAP Social Impact Manager, Social Impact Specialist, SEIP Specialist, Social Impact Assistant Specialist
TANAP Monthly Site Environmental Coordination Meetings	Current status of the environmental issues at site is discussed and site challenges during construction activities are evaluated.	TANAP Environmental Team in Ankara Office and Site Environmental Specialists of each Construction Site under the leader of Environmental Manager
TANAP Ad-hoc Environmental-Engineering Meetings	Environmental Issues arisen during Detailed Engineering phase was discussed and evaluated.	TANAP Environmental Manager, Senior Environmental Expert, Engineering Manager, Pipeline Engineer and/or other specific experts
TANAP Ad-hoc Site Social Coordination Meetings	Social issues at site are discussed and evaluated.	TANAP Ankara Office Social Impact Team and Site Social Impact Specialists of each Construction Site under the leader of Social Manager
TANAP Weekly Report	TANAP reports weekly progress to senior management	N/A
TANAP Monthly Report	TANAP reports monthly progress to senior management and shareholders	N/A

Communication with Contractors and Consultants is ensured as per the following communication methods given in Table 5.

**Table 5 Communication with Contractors and Consultants**

Communication type	Subject of the Communication	Participants
Weekly Environmental and Social Progress Meetings with EPCM Environmental and Social Team	Weekly issues regarding environmental and social management of EPCM are discussed in these meetings.	TANAP Environmental and Social Managers, EPCM E&S Manager, EPCM Environmental Compliance Lead, EPCM Social Compliance Lead
Monthly EPCM/ CC meetings	TANAP attends to monthly meetings of EPCM-CC to follow-up the progress at site	TANAP Construction, Contracts, Quality, HS, Environmental, Social Managers and/or experts, EPCM Construction, Contracts, Quality, HS, Environmental, Social Managers and/or experts, CC Construction, Contratcs, Quality, HS, Environmental, Social Managers and/or experts
Progress Reports of EPCM	TANAP reviews weekly and monthly EPCM reports to follow up progress of EMS  Additional monthly environmental summary reports are prepared and sent by EPCM, in order to ensure the regular review of the progress of Construction Contractors.	N/A
Bi-weekly Meeting of Archaeological and Environmental Consultants	TANAP holds these meetings for the communication of Third party Monitoring Company, Çınar and Archaeological Consultant, Regio (Regio Raporlama Etüd Geliştirme Org. Dan. Eğitim A.Ş.)	TANAP Environmental and Social Team, EPCM Environmental and Social Team, TPMC's Project Manager and relevant required personnel.  TANAP Environmental Manager, Lead Environmental Engineer, Archaeologist, Archaeological Consultant's Project Director and Manager, TANAP Contracts Specialist, when required.
Progress Reports of Archaeological and Environmental Consultants	TANAP reviews daily, weekly, monthly and quarterly reports of Third party Monitoring Company, Çınar and Archaeological Consultant, Regio.	N/A

## 4. ENVIRONMENTAL AND SOCIAL IMPACTS

This section presents the basic understanding of the Environmental and Social Impact assessment methodology, which is further explained in detail in Annex 5. The potential major impacts and major mitigations including the community safety aspects, as well as describing the process of third party monitoring are stated. BAP study, which was conducted right after the ESIA approval, was explained considering major findings and mitigations. The last section defines the transboundary impact assessment results, considering both the impact assessment results and the additional modelling study.

### 4.1. ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

The impact assessment process as defined in a general perspective in Section 3.2 used a methodology, which is highly transparent and semi-quantitative based on the DPSIR Framework of EEA. The methodology is also based on cartographical outputs to identify the hot-spot areas, where significant impacts are likely to occur.

Overall the methodology is based on the identification of the following elements:

- **Project components (Drivers):** units with specific physical, technological and location that are part of the Project
- **Project activities:** each activity that are necessary for the construction, operation or decommissioning of the various project components;
- **Impact factors (Pressures):** forms of direct or indirect interference produced by the Project actions on the **environment** and society, able to influence the environmental and social state or quality;
- **Sensitivity (State):** sum of the conditions which characterize the present quality and/or trends of specific **environmental** and social **components** and/or of their resources;
- **Impacts (Impacts):** changes undergone by the environmental and social state or quality because of the **different** impact factors generated by the Project actions;
- **Mitigation measures (Responses):** actions adopted in order to avoid or minimize potential adverse impacts, or to enhance positive **impacts**.

The GIS based methodology of Golder used in the environmental and social impact assessment of the project is summarized in Annex 5.

### 4.2. IMPACTS & MITIGATION MEASURES

Studies were conducted for the estimation of the extent of the potential impacts of TANAP project and also for the assessment of their significance. Required mitigation measures were also identified in the assessment phase (**pls. see Tables 6-8**). Computer programs were used for the estimation of the extent of the potential impacts of noise and air emissions by conducting modelling studies.

Informing the parties (public and other stakeholders) who may be affected by the Project and taking their opinions, collecting baseline data and progress and design of the project were all carried out in parallel schedules providing continuous interaction.

After the ESIA process was completed, monitoring activities started to be conducted by Third Party Monitoring Company (TPMC), i.e. Çınar as shown in Table 3, for the construction, operation and decommissioning periods in order to follow up the implementation and the efficiency of the environmental and social mitigation measures. Defined mitigation measures and monitoring requirements are considered during the detailed design of the Project. These mitigation measures and monitoring requirements are reflected for the construction, operation and decommissioning phases, of which are incorporated to the management and monitoring plans included in the tender documentation, which ensures the Project Contractors to be informed on these requirements, and enforces their compliance with these environmental and social requirements. Reported non-compliances by TPMC are followed-up continuously through the daily, weekly and monthly reports as stated in Table 5, which are shared with EPCM as well for their action.

**Table 6 Impacts on Physical Components during Construction and Operation**

<b>Potential significant impacts during construction</b>	<b>Proposed Mitigation measures</b>
<p><b>Air quality</b> associated with the dust and air pollutants associated with the construction earthworks, vehicle traffic.</p>	<p><b>Emissions from vehicle exhausts used for transport of workers, construction material, vehicles and equipment will be minimized</b> through good practices e.g. proper maintenance, restriction on idling and running of vehicle engines only when required.</p> <p><b>Frequent mist spraying</b> should be applied on dusty areas. The frequency of spraying will depend upon local conditions such as rainfall, temperature, wind speed and humidity. The amount of mist spraying should be just enough to dampen the material without over-watering which could result in surface water runoff.</p>
<p><b>Soil and land use</b> associated with the erosion and sedimentation along pipeline routes; changes in land use capability and loss of agricultural land.</p>	<p><b>A designated right of way (ROW)</b> working strip has been defined and restrictions of works will be performed in the designated ROW. The ROW will be reduced at forest and ecologically sensitive areas.</p> <p><b>Existing roads will be used</b> as much as possible and development of new roads will be minimized.</p> <p><b>Top soil management measures</b> will be in place. The top soil will be stripped, salvaged and stored to be laid back after the completion of construction works.</p> <p>Procedures will be in place to <b>prevent soil contamination</b> during construction works.</p> <p>Temporary <b>erosion control measures</b> will be in place during construction.</p> <p>The disturbed areas will be <b>reinstated/ re-vegetated and appropriate bioremediation techniques</b> will be used to bring the disturbed areas to original conditions.</p>
<p><b>Hydrology and surface water quality</b> associated with water pollution through the mobilisation of sediments due to river crossing activities and release of sewage and wastewater.</p>	<p>Construction activities at the river crossings will be limited to <b>periods of low flow</b>, when sediments are minimal.</p> <p><b>Trenchless or isolation methods</b> will be used at selected river crossings as per the engineering specifications.</p> <p><b>Hydrostatic testing</b> will be planned so that the opportunities for <b>water re-use</b> are maximized: First priority is to <b>use surface water for hydro testing</b>, if this is not possible groundwater resources can be used with permission and ensuring no impact on public use and environmental sensitivities.</p>
<p><b>Air quality</b> associated with air emissions mainly from dust from ongoing management of the pipelines and compressor station functioning.</p>	<p>The <b>limited noise and air emissions</b> generated from the compressor stations will be <b>minimized</b> through design and operating procedures.</p>
<p><b>Visual aesthetics</b> associated with the above ground installations.</p>	<p>During the operation of the pipeline TANAP, landscaping measures will be in place to <b>minimize the visual impacts</b> of the compressors stations.</p>

**Table 7 Impacts on Biological Components during Construction and Operation**

Potential significant major impacts during construction	Proposed mitigation measures
<p><b>Terrestrial habitats, Flora and Fauna</b> associated with;</p> <p>Loss or alteration of ecologically sensitive areas and wetlands due to direct or indirect impacts from land clearing or project construction</p> <p>Loss or alteration of rare plants and rare plant communities due to direct or indirect impacts from land clearing or project construction</p> <p>Loss or alteration of forests due to direct or indirect impacts from land clearing or project construction</p> <p>Negative effects (pathogen or contaminant introduction, reduction of photosynthetic capacity, or light availability) on plant species adjacent to roads due to increased road dust from project traffic</p> <p>Soil erosion or change in quality affecting vegetation communities</p> <p>Alteration of vegetation communities due to indirect impacts of changes to surface water or groundwater quality or quantity</p> <p>Altered community structure due to the proliferation of weed species.</p>	<ul style="list-style-type: none"> <li>• Implement strategies for surface water and groundwater protection</li> <li>• Re-locate project components, where practical, if some Project areas contain rare species or environmentally sensitive areas</li> <li>• Transport Project workforce by bus to reduce traffic volumes</li> <li>• Implement dust control measures on access roads</li> <li>• Locate project components on previously disturbed areas rather than new areas where possible</li> <li>• Locate project components away from wetlands to the extent practicable</li> <li>• Maximize the use of existing corridors/roads</li> <li>• Avoid using sensitive areas if extra land is required for project activities</li> <li>• Construction Works will be completed in shorter periods, during low flow and/or non-breeding/spawning seasons at sensitive areas.</li> <li>• Reduce construction width (30 m) at sensitive areas</li> <li>• Implement Special Method statements for construction and reinstatement at special/sensitive areas</li> <li>• Implement strategies to minimize impacts to soil structure, quality and capability</li> </ul>
<p><b>Marine habitats, Flora and Fauna</b> associated with the pipe laying at coastal areas</p>	<ul style="list-style-type: none"> <li>• The location of the marine crossing is going to be in a location that has already been significantly altered/degraded by due to the construction activities of the existing pipeline.</li> <li>• No liquid or solid substance will be disposed into the sea;</li> <li>• Necessary precaution to avoid accidental dropping of the construction wastes into the sea will be taken into account;</li> <li>• Appropriate measures will be implemented in case of any accidental release and/or leakage (e.g. site specific pollution prevention plan, emergency response plan).</li> <li>• Water discharge permits and approvals will be obtained from relevant authorities for all kind of wastewater discharge, including the water used in the hydro-test;</li> <li>• If necessary, assess in detail the presence and distribution of sea grass in the LSA.</li> <li>• Avoid as much as possible the destruction of sea grasses, most of which are a remarkable habitat<sup>7</sup>;</li> <li>• Minimize the unavoidable impacts of suspended sediment in the LSA;</li> <li>• According to the results of the sea grass distribution map, if necessary, a modelling of the sediment dispersion during the trenching activities should be elaborated;</li> </ul>

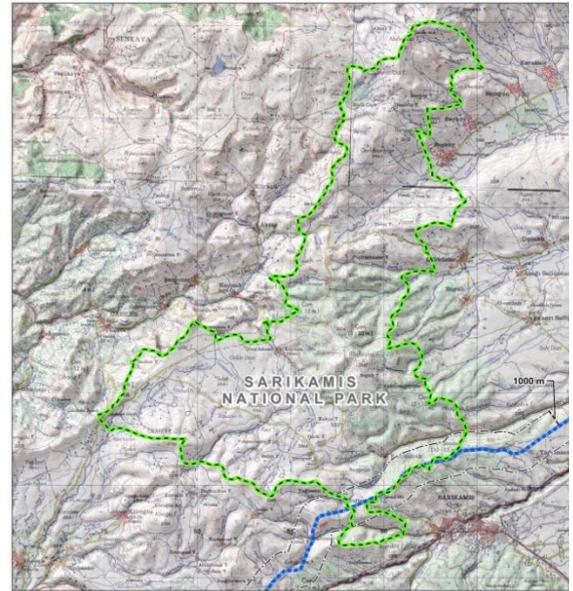
<sup>7</sup> According UNEP(OCA)/MED WG 149/5 rev.1 – Annex IV

	<ul style="list-style-type: none"> <li>• Anchoring activities should be avoided as much as possible on sea bottoms colonized by sea grasses;</li> <li>• For the hydro-test, if possible, use environmental-friendly, non-toxic and biodegradable chemicals and then treat wastewater before their (careful and regulated) discharge into the environment;</li> </ul>
<b>Aquatic habitats, Flora and Fauna</b> associated with the crossing river with open-cut method.	<ul style="list-style-type: none"> <li>• Discharge of wastewater to surface water resources after treatment in compliance with the applicable regulatory requirements.</li> <li>• Avoid vehicle crossings across the watercourse to the extent practicable.</li> <li>• Limit construction activities to the extent practicable to periods of low flow, when sediments are minimal.</li> <li>• Design and install buried pipeline and road crossings in accordance with applicable best practices.</li> <li>• Ensure all equipment working in or near watercourses is clean and free of fluid leaks</li> <li>• Use appropriate sediment and erosion control techniques (e.g., silt fences) during construction</li> <li>• Restore and stabilize channel banks immediately after backfilling to prevent bank erosion</li> <li>• Use clean, native materials during bed and bank restoration works</li> <li>• Monitor watercourse turbidity during construction and take corrective actions where required</li> <li>• Prevent turbid water from re-entering the watercourse using natural or mechanized filtration processes</li> <li>• Install and maintain appropriate erosion control measures such as silt fences around all riparian disturbance areas and watercourse crossings</li> <li>• Implement a re-growth of riparian vegetation programme</li> <li>• Record all volumes of water withdrawal from natural resources for project related activities for demonstration of no exceedance of the allowance</li> <li>• Obtain applicable water abstraction permits</li> <li>• Install temporary vehicle crossings/bridges</li> <li>• Restrict fuelling/refilling, chemical handling activities in close vicinity of the watercourses</li> <li>• Plan construction to consider seasonal sensitivities</li> <li>• Strictly prohibit fishing at watercourses</li> <li>• Implement special construction mitigations to protect sensitive species</li> </ul>
<b>Potential impacts during operation</b>	<b>Proposed Mitigation measures</b>
During the operation phase <b>no biological components are expected</b> to be particularly impacted, since the bio-restoration works will be correctly conducted.	

Photos 8 and 9 show the unavoidable intersections with protected areas Manyas and Sarikamış of which authority correspondences were completed and permits were received.



**Photo 8 Intersection with Manyas Lake Wetland**



**Photo 9 Intersection with Sarikamış Forest**

**Table 8 Impacts on Social Components during Construction and Operation**

Potential Significant Impacts During Construction	Proposed Mitigation Measures
During the construction phase main impacts on traffic and roads will occur <b>in crossings between the pipeline corridor and existing roads.</b>	<p><b>Access to properties will be guaranteed</b> or appropriate alternative accesses that are agreed with owners or users will be implemented.</p> <p><b>Access to settlements will always be guaranteed</b> either through diversions or by allowing the passage of vehicles and livestock at certain hours through the use of appropriate solutions.</p>
The need to transport material, products and staff will lead to <b>increased traffic, mainly of heavy vehicles, on the existing road network.</b>	<p><b>Trainings</b> will be provided to the adults and children in the settlement areas along and around the pipeline route in order to increase traffic awareness.</p> <p><b>Temporary traffic control and appropriate signs</b> will be used to highlight warnings and to improve safety.</p>
With reference to the land use the main social impact will occur primarily during the construction phase when <b>restriction will be applied to land use</b> (e.g. agriculture, grazing).	There will be <b>Compensation measures</b> for the impacts on livelihood of the community.
The corridor crosses a <b>number of existing infrastructure facilities.</b> The pipeline routes has been planned to limit interference with residential areas. Nevertheless some temporary impacts are expected during the construction phase (e.g. routes; irrigation systems).	<p><b>Any damage to utility distribution networks</b> will be repaired promptly.</p> <p><b>Access to utility distribution networks</b> for Project needs will be agreed with affected land owners or land users.</p> <p><b>Any planned disruption of utility distribution services</b> will be communicated to local authorities and local communities with at least 72 hours' notice in advance; where planned disruptions are expected to last more than 12 hours, a specific risk analysis will be performed to assess impacts expected on local communities and to identify additional mitigation measures</p>
Due to the scale of the Project <b>a large number of workers</b> will be needed during the construction phase generating impacts (positive and negative) on the social context. Accommodations at the camp sites will be available for the workers.	<p>.</p> <p><b>Code of Conduct</b>, containing rules that workers are to follow both during working hours and in campsites; and recommendations on behavior during free-time, is a part of the Employment and Training Plans, which each CC will prepare. Code of Conduct is a component of the induction training for construction workers. The induction training will also include training on interacting with local communities and local customs.</p> <p>Implementation of the Code of Conduct is the responsibility of the CC and the violation is addressed in the discipline procedure. Local hiring procedure is described in the Employment and Training Plans. Local hiring will be carried out through local recruitment agencies and announcement through local district offices.</p>
Impacts on cultural heritage are at two different levels: the risk that project activities may <b>damage monuments and sites</b> and the risk that Project activities may disrupt <b>intangible heritage such as festivities and traditional beliefs.</b>	<b>Local communities and authorities will be consulted</b> to identify if Project activities restrict access to elements of traditional culture and/or interfere with traditional celebrations or festivities; alternative solutions will be agreed with the parties.

Potential Significant Impacts During Operation	Proposed Mitigation Measures
<p><b>During the operation phase of the Project, the component most likely to be impacted is employment and livelihoods.</b> The pipeline is expected to imply minor long-term restrictions on the current land use along the pipeline right of way, no tree planting, constructing building, using heavy vehicles, etc. Landowners will be able to use their lands back for former agricultural purposes under the specified conditions.</p>	<p>The <b>local employment and procurement</b> will be maximized to increase the positive impact on the socio-economic conditions of the region.</p>

The engineering design of the TANAP Pipeline System has minimized hazards and reduced risks, following the ALARP (As Low as Reasonably Practicable) principle, according to best industry practice.

An overview of the activities undertaken to identify the hazards and assess the risks potentially generated by the TANAP Pipeline and, on the basis of the findings, the defined relevant prevention and mitigation measures that are embedded in the design for both the process safety, environmental impact prevention and community safety purposes during operation phase, are as presented below.

The design of the pipeline system includes the following principles:

- Minimizing hazardous inventories.
- Minimizing the likelihood of leakage through design integrity, i.e. use of appropriate materials of construction, use of welded rather than screwed fittings where practicable, minimizing the number of valves, flanges, fittings, instruments and other leak sources.
  - Employing a fully automated process monitoring and control system resulting in reduced personnel in process areas.
  - Employing a basic process control system (PCS) with a separate Safety Instrumented System (SIS) combining the functions for process shutdown, emergency shutdown and fire and gas detection.
- Ensuring facility separation/segregation (manned locations remote from process).
- Employing overpressure protection inclusive of pressure relief.
- Minimizing ignition sources.
- Preventing the build-up of flammable gas mixtures.
- Providing active/passive fire and explosion protection.
- Providing adequate escape, evacuation and rescue systems for personnel.

To ensure the implementation of these principles, during the project design various risk analysis studies have been performed for the project such as:

1. Environmental Hazards Identification Study (ENVID)
2. Hazard Identification Study (HAZID)
3. Hazard and Operability Study (HAZOP)
4. Safety Integrity Level Analysis (SIL)
5. Fire and Explosion Hazard Analysis (FEHA)
6. Quantitative Risk Assessment (QRA)
7. Project Health & Safety and Environmental Review (PHSER)

In addition to the above items; during the ESIA preparation phase, distances of health protection strip was defined regarding the required actions identified within the Regulation on Enterprise Opening and Operating Licenses that came into force by being published in the Official Gazette dated 10.08.2005 and numbered 25902. Health Protection Strip distances cannot be defined out of land acquisition borders and the areas to be expropriated are determined based on the health protection strip; meaning that the land acquisition border should cover the health strip zone. Current situation is based on this criterion; fence borders defined for the above ground installations are indicated including the health strip area. Therefore, there will be no additional restrictions to be applied around the fenced area. As there is no opportunity to build fence over the pipeline to enable re-use by the owners/users, the 16m is acquired as per the HGA which includes the health strip which fits with the health protection regulation with certain restrictions such as not constructing any building, animal shelter for communities' health protection within the specified zone.

Furthermore, according to the Article 6 of the Regulation, "activities won't be initiated before opening and operating licenses are received". Health Protection Strip is proposed around the facilities such as camp sites, block valve, compressor and pigging stations that are installed and will be installed on NGP route and necessary pre-cautions will be taken for the Health Protection Strip not to be violated.

In case the pipeline passes close to the residential areas, safety pre-cautions will be taken, safety distance will be provided on both sides of the pipeline, other construction works won't be permitted on these areas. Health protection strip distances will be signed on master plans by the related Development Directorate and related authorities for this purpose.

The distances of Health Protection Zone for the project are approved by Ministry of Health as given below:

Pipeline:	7 meters from edge of the pipeline, 14 meters in total along the pipeline route
Compressor stations:	75 meters from compressor units
Metering stations:	30 meters from the metering units
Pigging stations:	30 meters from pigging facilities
Block valve stations:	20 meters from the block valves

However, compared to the pipelines in other countries, which has restricted land, proximity to residential areas are kept in very long distances in TANAP pipeline, as long as possible. The pipeline route will be highlighted and signed in order to make community aware of the pipeline route. The above ground installations will be fenced to prevent unauthorized entry of the people.

Operation phase Community Safety Plan will be prepared by TANAP and required communication will be ensured by Community Liaison Officers as conducted during the Construction phase by EPCM and Construction Contractors.

### 4.3. BIODIVERSITY ACTION PLAN

The purpose of the Biodiversity Action Plan, prepared within the scope of the TANAP Project, is to identify the species and habitats, considering the priorities of national, international and local species and habitats and consequently to determine the applicable and area-specific actions to protect and conserve the biodiversity on the 36 m ROW during the construction, operation and decommissioning phases of the Project.

The presence of natural habitats (Please see Annex 3), intersections of the ROW with the protected or conservation areas (Please see Annex 4) and ecologically sensitive species was observed in detail along the ROW. This screening procedure was done on the ground by a team of specialists, selected for their detailed knowledge of the study area.

Within the BAP process, the findings produced in the baseline studies carried out during the TANAP EIA studies were re-evaluated. Within this context, in the desktop studies:

- The findings of the field studies performed during the EIA studies in a 500 m LSA were re-assessed for 36 m ROW.
- Natural habitats, SCC's and potential SCC's were re-assessed, and field studies for potential SCC's were also planned.
- Field studies for considered species and habitats were planned by experts in the relevant disciplines.
- Intersects of the ROW with the protected areas or high biodiversity areas were reviewed.

Biodiversity Action plan was prepared by local ESIA Consultant, Çınar right after the completion of ESIA and receiving the approval from MOEU on 24th of July, 2014. The Project team includes several professors and associated professors from universities, who are expertized in their field, most of which have been attended the ESIA process as well. During desktop studies, findings of the TANAP ESIA, in which critical species were identified in baseline studies and EUNIS habitat maps have already been prepared, were re-evaluated. The findings of the 500 m local study area of ESIA Report were re-assessed for 36 m right of way. Field studies were conducted in August-October 2014 period and KP specific critical habitat sections were identified both for terrestrial and freshwater critical habitat types, specifying each related specie under these critical habitat sections.

Critical habitats are defined as areas of high biodiversity value that include at least one or more of the five values specified in paragraph 16, IFC (2012)<sup>8</sup> Performance Standard 6 and/or other recognised high biodiversity values. These values are as follows: (i) habitat of significant importance to Critically Endangered and/or Endangered species, (ii) habitat of significant importance to endemic and/or restricted-range species, (iii) habitat supporting globally significant concentrations of migratory species and/or congregatory species, (iv) highly

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<sup>8</sup> IFC, 2012, IFC Sustainability Framework - Effective January, 1, 2012, 1st January 2012. ed. International Finance Corporation, Washington DC, USA.

threatened and/or unique ecosystems and/or (v) areas associated with key evolutionary processes. However, according to IFC (2012), identifying a critical habitat does not have to be limited to these criteria. Other recognised high biodiversity values may support the assessment of a habitat as critical and the suitability of such a decision is assessed at case basis.

As a result of the studies conducted within the framework of BAP, the followings were assessed:

*a. TERRESTRIAL & FRESHWATER:*

- 54 flora taxa belonging to 22 families,
- Three mammalian species belonging to three families,
- Seven bird species belonging to five families,
- Three reptilian species belonging to two families,
- One amphibian specie belonging to one family,
- 16 arthropod species belonging to 10 families and
- 23 natural terrestrial EUNIS habitat types,
- Nine fish species belonging to five families,
- One freshwater macroinvertebrate specie,
- Two natural freshwater EUNIS habitat types.

The final SCC identified according to the IFC (2012) criteria and tiers, based on the SCC determined during the ESIA studies. 14 of 94 identified SCC species (14.9% of SCC Species) have CR (Critically Endangered) category according to the IUCN Red List. These are:

- *Alyssum dudleyi* (Plant)
- *Astragalus aytatchii* (Plant)
- *Cephalaria aytachii* (Plant)
- *Dianthus goekayi* (Plant)
- *Gypsophila heteropoda* subsp. *minutiflora* (Plant)
- *Gypsophila osmangaziensis* (Plant)
- *Hieracium sarykamyschense* (Plant)
- *Salvia tchihatcheffii* (Plant)
- *Verbascum* sp. nov. (Plant)
- *Vanellus gregarius* (Bird)
- *Montivipera wagneri* (Reptile)
- *Anguilla anguilla* (Fish)
- *Cobitis punctulata* (Fish)
- *Oxyneomacheilus simavica* (Fish)

According to the impact assessment, there will be no long term or permanent significant impact for these "CR" category SCC's. There is no expectation of;

- the long-term decrease in the size of population,
- fragment or increase fragmentation of an ecological community,
- reduce the area of occupancy of the species,
- fragment an existing population into two or more populations,

- substantially modify, destroy or isolate an area of important habitat for a migratory species,
- seriously disrupt the lifecycle of an ecologically significant proportion of the population of a migratory species,
- adversely affect CH to the survival of a species,
- disrupt the breeding cycle of a population,
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,
- areas of the wetland being destroyed or substantially modified.

Determined SCC criteria, tiers and special mitigation measures are given in Annex 1 and Annex 2.

There are 67 terrestrial and 27 freshwater critical habitats identified. Terrestrial critical habitats cover only 0.39% of the ESIA (500 m) corridor and 5.6% of the ROW (36 m) and regarding OP 4.04 WB definitions, according to the quantitative impact assessment, of which have been conducted based on the methodology used in Environmental and Social Impact Assessment Studies (DPSIR framework, GIS based approach), there is low degree of impacts expected on natural and critical habitats, therefore significant permanent and long term impacts are not expected and the defined mitigation measures are sufficient for the recovery of habitats, therefore offsets are not required according to the local experts.

*b. MARINE:*

There are no critical habitats for marine environment, neither critical marine species nor marine protected & conservation areas elaborated along the project route during the ESIA process. In addition, the area where the offshore section of TANAP route passes from is determined as a corridor for energy and infrastructure projects. There is an existing pipeline, Turkey – Greece Natural Gas Pipeline, in the area of offshore section of TANAP route. Thus, the area is already disturbed due to the construction activities of the existing pipeline.

*IMPACTS:*

Impact factors are considered to have a potential effect on habitats; the intensity of the impact factors during construction for the various project components is presented in the ESIA Report. Project activities will affect habitats in many ways (emission of dust, emission of gaseous pollutants, changes of local morphology etc.) but **mainly** through the;

- Removal of natural vegetation
- Reduction of topsoil quality/availability
- Introduction of alien species

Construction activities will affect habitats mainly through the removal of natural vegetation related to the site preparation phase prior to construction; typically trees are felled along the pipeline Row direction, while shrubs and grass species are removed by scraping. , ultimately If the presence of forest coverage of the area is compared with the ROW corridor, there is only low degree impacts expected. Their magnitude will not cause major change in land use or not cause modification that substantially minimizes the habitat's ability to maintain viable populations of its native species. Also their flora and fauna species

elaborated and if some species could be affected, some mitigation measures for them, species-specific, were defined. At the end of construction works, reforestation for compensation will be done at least equal to the number of trees cut during site preparation in line with the view of the Regional Directorates of Forestry.

“Erosion, Reinstatement and Landscape Plan” was prepared, for removal of natural vegetation and reduction of topsoil quality/availability; before the construction works started and “Alien Invasive Species Guidance Document” is prepared for the prevention of ROW from the introduction of alien invasive species.

The mitigation measures for the pre and post-construction periods are determined in the light of the successful experiences gained during the biore restoration process of an existing pipeline project that is passing from a parallel route to TANAP route, in the north-eastern part of Turkey. The biore restoration monitoring conducted on the RoW for several years after construction and ecologically sensitive areas in the existing pipeline project prove that very high vegetation cover percentages (over 95%) on RoW and species diversity composition, same as the one in areas undisturbed by the project activities, are obtained when the determined pre-and post-construction measures are implemented. Currently within the framework of BAP, in order to ensure the conservation of these highly sensitive habitats and species, future monitoring programmes including monitoring schedule and achievement criteria and the species/habitat action plans have been developed. Environmental Monitoring Plan of TANAP outlines the required monitoring activities and frequencies. Contractors are responsible for maintaining and monitoring biore restoration requirements, regarding their Erosion, Reinstatement and Landscaping Plan. Site specific method statements will be prepared by Contractors and submitted to approval of EPCM/TANAP. In addition, a long term effective physical and ecological monitoring program, considering the methodology and schedule, will be prepared and implemented by TANAP in order to measure the success of biore restoration and physical condition of the pipeline route (i.e. erosion etc.)

For the reduction of topsoil quality/availability and introduction of alien species, mitigation measures are stated in ESIA and BAP Reports. The top soil management and invasive species control are important for them. Some special mitigation measures are stated for some habitats. For example, gypsum steppes is one of the most important habitat type which intersect with the project route, one mitigation measure for this habitat is the storing the gypsum rocks/stones near the ROW without mixing the top soil, thus after construction activities, it will be spreading over the ROW and habitat will be renewed.

“Invasive flora species control should be done in all critical habitats” is the mitigation measure for introduction of alien species, of which have been defined in the BAP and ESIA Report. General preventive measures for invasive species are listed below and a guidance document for the control of alien invasive species is prepared and presented in the BAP Report:

- Designate sites for cleaning tools, vehicles, and equipments (Clean tools, equipment, vehicles and animals before transporting materials and before entering and leaving worksites.)
- Avoid working during rain events and high winds. Wet conditions make it easier for seeds to be picked up by a vehicle and spread kilometres down the road.
- Avoid driving off-road whenever possible.
- Stop movement of invasive species materials.
- Minimize soil and vegetation disturbance.

- If the alien invasive species are observed in the area, a combination of farm tractors (grass cutter) and a manual team equipped with scythes to access and manually cut the weeds where access by machinery is unachievable. Also hand pulling or digging, constructing barriers, grazing by livestock and trapping are the examples of some eradication options for alien invasive species.

The detailed procedures for alien invasive species are given in the Alien Invasive Species Guidance Document.

Based on the analysis of the project; impact factors are considered to have a potential effect on terrestrial ecosystems and certain mitigation measures were suggested by local experts. There are many mitigation measures elaborated in both ESIA and BAP Reports. Key mitigation measures for habitats and species are given below (Please see Table 9 and Table 10).

**Table 9 Key mitigation measures for terrestrial habitats and species**

<b>FOR HABITATS</b>	<ul style="list-style-type: none"> <li>• Top soil management</li> <li>• Collect endemic and/or non-endemic seeds of natural plants of the regions to control erosion at sloping areas</li> <li>• Use certain endemic flora species seeds for bio-restoration (additional seeds will be collected from nearby areas against erosion on sloping areas)</li> <li>• Locate project components on previously disturbed areas rather than new areas where possible</li> <li>• Maximize the use of existing corridors/roads</li> <li>• Avoid using sensitive areas if extra land is required for project activities</li> <li>• Plan construction to complete works in shorter periods at sensitive areas</li> <li>• Reduce construction width at sensitive areas (30 m)</li> <li>• RestoreRestora stone and rocks</li> <li>• Scrap the top soil as a layer</li> <li>• Rehabilitate the riparian vegetation, aquatic and semi aquatic area</li> <li>• Control invasive flora species</li> </ul>
<b>FOR SPECIES</b>	<ul style="list-style-type: none"> <li>• Avoid construction during reproduction seasons of sensitive wildlife (Time constraints)</li> <li>• Seed or bulb collection, translocation, relocation</li> <li>• Minimize habitat loss</li> <li>• Minimize habitat fragmentation</li> <li>• Minimize habitat alteration</li> <li>• Minimize traffic and speed of traffic to prevent vehicle-wildlife collisions as well as dust and air emissions</li> <li>• Use existing corridors for main access roads and ROW</li> <li>• Giving some of the collected seeds of endemic species to the gene bank, use some of these seeds for biorestoreation</li> <li>• Carrying some SCC fauna species to the appropriate and close areas</li> <li>• Harvesting and storing herbaceous plants (which carrying SCC arthropod species eggs) near the ROW in the aerated conditions, so eggs can be hatched and individuals will not has any damage.</li> </ul>

**Table 10 Key mitigation measures for freshwater habitats and species**

<b>FOR HABITATS</b>	<ul style="list-style-type: none"> <li>• Conduct construction works during the time when flow is low and limited timeframe (Time constraint: April-June)</li> <li>• Restore the water passages to the condition before the construction where possible</li> <li>• Minimize impact to riparian vegetation</li> <li>• Plan construction to complete works in shorter periods at sensitive areas</li> <li>• Avoid impact and removal of gravel</li> <li>• Minimize erosion</li> <li>• Install silt screens and sediment traps</li> <li>• Restore riparian vegetation</li> </ul>
<b>FOR SPECIES</b>	<ul style="list-style-type: none"> <li>• Avoid construction during reproduction seasons of freshwater fish (Time constraints)</li> <li>• Minimize habitat loss</li> <li>• Restore the bottom structure</li> <li>• Restore the riparian vegetation (spawning areas)</li> </ul>

Besides these mitigation measures, there are special mitigation measures given for certain species:

- Time constraints for these SCC hibernation, breeding, vegetation period or migration seasons;
- Carrying the individuals of certain fauna SCC to the appropriate and closed areas by specialist;
- Carrying and placing the nest materials (stored food found in the excavated gallery systems) to the new transferred nesting area;
- Stopping the construction works if any risk foreseen for congregatory bird species *Phalacrocorax carbo*, *Phalacrocorax pygmeus*, *Cygnus olor*, *Cygnus cygnus* and *Pelecanus onocrotalus* which constitute groups at critical habitats CH64 & CH67, the. The habitat locations are become became a flooded wetland during their breeding season between February-March(March.),construction Construction works will be stopped .during this breeding period.

There is no seasonal constraint for marine construction because there is no breeding area in the sea crossing for marine fauna species. The construction activities are carried out outside the fish migration season (September-November) because of social constraints of fishermen.

BAP and ESIA Reports (Chapter 8.2., Appendix 4.5 and Appendix 5.1) have detailed information for mitigation measures of which have been considered and incorporated in the ESMPs of CCs.

Also, monitoring periods, given in the BAP Report, will be 1st, 3rd, 5th, 8th and 10th years. In these periods, achievement criteria given in the BAP Report will be monitored as presented below:

\* 1st year: The main purpose is to prevent erosion. To this end, especially in highly sloped areas, the seeds of the endemic plants of the region should be collected and planted on the ROW for erosion control. In the 1st year, observing 10% plant diversity in the area is a criterion of achievement.

\* 3rd year: The main purpose is that the vegetation cover growing on the ROW is 30% similar to the nearby natural vegetation; the flora and fauna species diversity being 40% identical is a criterion of achievement.

\* 5th year: The main purpose is that the vegetation cover growing on the ROW is 50% similar to the nearby natural vegetation; the flora and fauna species diversity being 60% identical is a criterion of achievement.

\* 8th year: The main purpose is that the vegetation cover growing on the ROW is 70% similar to the nearby natural vegetation; the flora and fauna species diversity being 80% identical is a criterion of achievement.

\* 10th year: The main purpose is that the vegetation cover growing on the ROW is 100% similar to the nearby natural vegetation; the flora and fauna species diversity being 100% identical is a criterion of achievement.

The BAP ecological field survey includes a database that offer consistent and useful information for the characterization and management of the ecological conditions of the pipeline right of way (ROW) and to ensure that the impacts that may occur can be controlled and managed during the construction activities. The ecological field survey covers and focus on a 36m wide swath centred on the proposed ROW and the study area in some places up to 70 meters in width along the TANAP route. For the purposes of the BAP, the ESIA was considered as a regional overview and the BAP ecological field survey as a more specific, local approach, considering that the ESIA had a 500m wide study corridor and the BAP ecological field survey was restricted to a 36m-wide area. BAP ecological field survey focused on potential impacts within and along and immediately adjacent to the ROW (36-70m) and used the ESIA as a macro perspective of the ROW surroundings<sup>9</sup>.

BAP Report constitutes the technical report and KP based drawings including both terrestrial and freshwater habitat locations. Terrestrial critical habitat mitigations were defined for each estimated construction periods; Spring (March-May), Summer (June-August), Autumn (September-November), as well as closed construction period and the ideal time for soil stripping. Freshwater critical habitat mitigations were defined as pre-construction and post-construction mitigations demonstrating the time constraint for construction based on the desktop and site-specific studies conducted.

<sup>9</sup> PERU LNG, Environment, Social, Health and Safety Management System (ESHMS), Biodiversity Action Plan, Document Number: 02/ES/PJ/PN/009/A01.

### 4.4. TRANSBOUNDARY IMPACT ASSESSMENT AND CUMULATIVE IMPACT ASSESSMENT

#### 4.4.1. Transboundary impact assessment

Some sections of the project route, due to the construction of the river crossings, are intersecting with the rivers and their tributaries, which are on the international waterways such as Posof River, Kura River, Karasu River. Figure 8 presents only the crossings on the main rivers as RVX1, RVX2 and on some major streams as RVX3a, on the international waterways that are being crossed by TANAP Project at three catchment basins; Aras, Fırat and Meriç-Ergene (based on Ministry classification). The classification of the river crossings are as defined in Table 11. TANAP classification system takes the size and the nature of the river (natural/man made) into account. However, regardless of the classification, TANAP’s policy is to equally protect all the rivers which have to be crossed using the appropriate mitigation measures, which are defined in the ESIA and summarized in the below sections. In addition, a site visit to all RVXs has been conducted, in which screen shots of the situation of them as dry or wet, have been taken on the day of the site visit to be used during the Design phase.

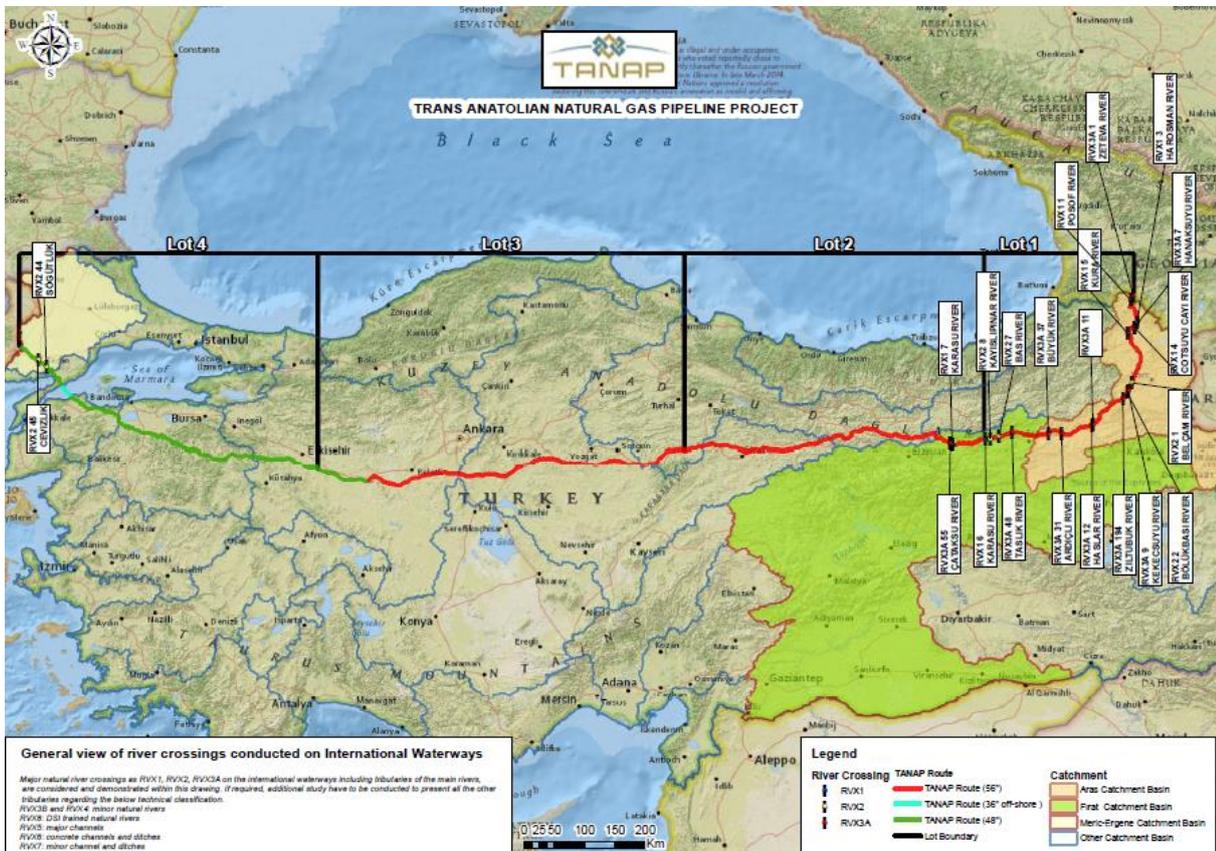


Figure 9 General view of River Crossings (RVX1, RVX2 and RVX3a)

**Table 11 The detailed definition of the river crossings for each type**

<b>Class/Type</b>	<b>Crossed Object</b>	<b>Notes</b>
RVX1	<i>Large River, width &gt; 30m</i>	Natural, major river, site specific design
RVX2	<i>River, 10m &lt; width &lt; 30m</i>	Natural, major river, site specific design
RVX3a	<i>Stream, 3m &lt; width &lt; 10m</i>	Natural, major stream, site specific design
RVX3b	<i>Stream, 3m &lt; width &lt; 10m</i>	Natural, minor stream, typical design
RVX4	<i>Small Stream, width &lt; 3m</i>	Natural, minor stream, typical design
RVX5	<i>Ditch, width &gt; 5m</i>	Man-made ditch, typical design unless trenchless crossing technique is used
RVX6	<i>Concrete Channel</i>	Man-made channel, typical design unless trenchless crossing technique is used
RVX7	<i>Ditch, width &lt; 5m</i>	Man-made ditch, typical design
RVX8	<i>Natural river/stream that has been trained by DSI</i>	Either site specific design or typical design depending on the size

ESIA Report evaluated the transboundary impacts as a separate chapter as well as evaluating the impact assessment results of the RVX1, RVX2 and RVX3a type rivers and streams that the project will cross, considering the physical, biological and social components defined during the ESIA scoping phase, in order to review and set clear mitigations for the prevention of the beyond regional impacts of the project. The matrices given in Annex 3 were used in the impact assessment methodology. Referring to the methodology, it can be identified that the spatial extent (area of influence: Aol) per impact factor in each project phase for the related project components ranges from footprint to 1000 m. Therefore, the potential impacts that was set forth to be generated on the local environment of Georgia during the whole construction activities is identified to be not affected by the river crossing construction activities. Some of the potential impacts considered during evaluation were; increase in the concentration of air pollutants, increase in the noise level, discharge of wastewater, and degradation of natural habitats that could impact fauna moving across the border. Considering that the nearest village in Georgia is at more than 3.2 km from the construction site, the impacts on the local communities can be considered negligible, as it is outside the Aol of the identified potential impacts. The results have been assessed using the baseline data and reports gathered during the ESIA Report preparation phase as defined in Section 3.2 of this document.

Considering the Cevizlik and Söğütlük river crossings within the Meriç (Evros)-Ergene Catchment Basin, these are far beyond the Aol of the potential identified impacts as they are located approximately 27 and 40 km away from the Greece border. In addition, baseline data collected both by the TAP project and the TANAP project did not show the presence of protected species of birds. Impacts on the river from hydrotesting, including

impacts on downstream users are considered to be negligible as there is good availability of water in the river.

Posof river crossing impact assessment has been evaluated as a sample in the below drawing, Figure 9. Although the impact level identified for the Posof River is high for the biological assessment end points, the area of influence is from footprint to 1000m. and is not reaching the beyond regional geographical extent.

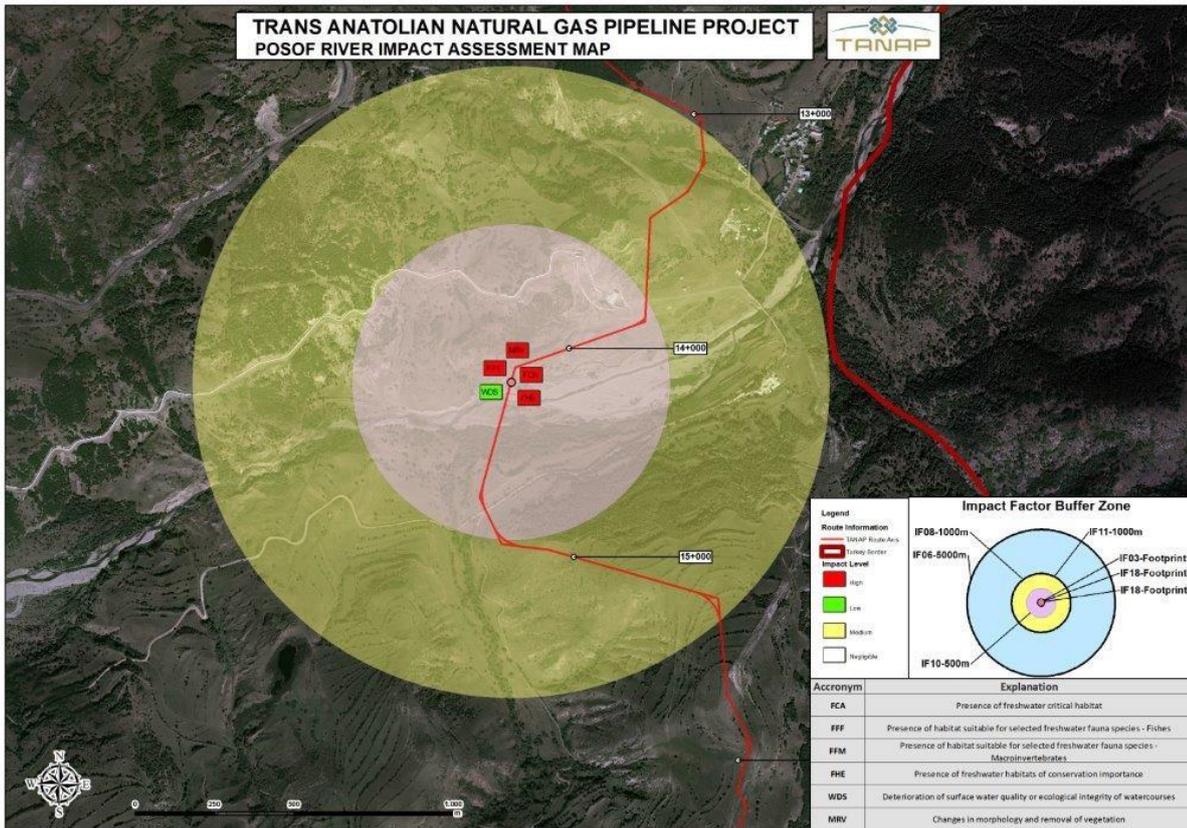


Figure 10 Posof River Impact Assessment Map

The other river crossings on the Fırat Catchment Basin has a negligible potential to demonstrate any transboundary impacts during construction due to sediment dispersion, as there are existing dams at the downstream.

No transboundary impacts are foreseen during operation. In addition to these assessments, as a supportive document, TANAP recently had a transboundary impact study prepared for Posof and Karasu creeks which is using the 4 km distance as a working domain from the river crossing towards the downstream in order to evaluate the sediment impact by Local ESIA Advisor Çınar. The study covers a sediment modelling as well as the evaluation of other physical factors. Together with the results of this study, a guidance note was prepared for the corporate interpretation of the impact assessment data on physical and biological components onof these rivers, which shows the negligible impact as a result of these detailed

studies and together with the interpretation and implementation of the required mitigation measures.

Taking into account the potential impacts mentioned above, mitigation measures are recommended within the ESIA Report, incorporated and being implemented within the ESMS of the CCs such as;

- \* Using methods for avoiding sediment formation and preventing of sediment movement to water bodies with e.g. silt fences, hay bale barriers or dry haystacks, taking into account the direction of water flow, flow rate and other characteristics of the area (e.g. soil structure, slope, plant cover, etc.),

- \* Limiting construction activities to periods of low flow, when sediments are minimal,

- \* Ensuring all equipment working in or near watercourses is clean and free of fluid leaks,

- \* Restoring and stabilizing channel banks immediately after backfilling to prevent bank erosion,

- \* Preventing turbid water from re-entering the watercourse using natural or mechanized filtration processes,

- \* Planning hydrostatic testing so that the opportunities for water re-use are maximized,

- \* Obtaining applicable water abstraction permits with the information of required amounts from the authority and record all volumes of water withdrawal from natural resources for project related activities for demonstration of no exceedance of the allowance,

- \* Restricting fuelling/refilling, chemical handling activities in close vicinity of the watercourses.

Considering the above mitigations are being implemented at site, being followed-up by TANAP/EPCM and being monitored by TPMC and as a result of the sediment modelling study recently conducted, no transboundary impacts are foreseen due to construction of the river crossings on the international waterways.

#### 4.4.2. Cumulative Impact Assessment

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 TANAP project and the other development projects; as an example it the emission of dust from the construction of the pipeline and the concurrent construction of a new road or industrial development at the same location are considered. The analysis of the potential cumulative impacts is carried out based on limited information collected from the relevant authorities, and in particular without the knowledge of the construction timeline.

The cumulative impact assessment was performed considering the same VECs identified for the environmental and social impact assessment. These VECs are as presented below:

- Physical environment:
  - Meteorology and climatology
  - Air Quality
  - Noise and Vibration
  - Hydrogeology and groundwater quality
  - Geology and Geomorphology
  - Seismology
  - Soil
  - Visual aesthetics
  - Hydrology and surface water quality
  - Bottom morphology
  - Physical oceanography
  - Sea water
  - Marine Sediments
- Biological environment
  - Protected areas
  - Terrestrial Flora
  - Terrestrial Fauna
    - Birds
    - Amphibians
    - Reptiles
    - Mammals
    - Invertebrates
  - Freshwater flora
  - Freshwater fauna
    - Fish
    - Invertebrates
  - Freshwater habitats and ecosystems
  - Terrestrial habitats and ecosystems
  - Biodiversity
  - Marine Flora
  - Marine Fauna
    - Fish
    - Zoobenthos
    - Mammals and reptiles
  - Marine habitats and ecosystems
  - Marine biodiversity
  - Marine protected areas
- Social environment
  - Politics and Governance
  - Settlement location
  - Demographic profile

- Infrastructure facilities
- Transportation and traffic
- Economic conditions
- Land use and agriculture
- Employment and livelihoods
- Social maladies
- Social capital
- Health issues and facilities
- Education issues and facilities
- Vulnerable groups
- Cultural heritage and archaeology
- Ecosystem services
- Resettlement and economic displacement.

The significance of the potential cumulative impacts are defined at four levels:

- Not significant (NS): the interaction is unlikely to generate cumulative impacts.
- Low significance (Low): the interaction could potentially generate some cumulative impacts on one or few VECs and a limited number of receptors.
- Significant (Medium): the interaction is likely to generate cumulative impacts on several VECs and/or over an extended geographical area involving several receptors.
- Very significant (High): the interaction is likely to generate extensive cumulative impacts over the majority of the VECS considered and potentially trigger exceedances in the levels of emissions.

Using the available information for each project, the significance of the cumulative impacts was evaluated and defined based on the following factors:

- Proximity of the other development projects to the TANAP pipeline route:
  - For projects crossing the pipeline route in one point the interaction is considered significant
  - For projects crossing the pipeline route in more than one point or over a continuous area the interaction is considered very significant
  - For projects adjacent to the pipeline the interaction is considered of low significant or not significant depending on the distance
- Extent of the predictable impacts of the other development projects:
  - For linear project involving excavation activities overlapping with the pipeline route excavation activities (roads, railways, pipelines, etc.) the interaction is considered significant
  - For projects do not involving excavation activities overlapping with the pipeline route (electrical lines) the interaction is considered of low significance.

The analysis of the projects was resulted in the identification of 14 projects with a high potential in terms of cumulative impacts in the TANAP project AoI, while 23 projects have a medium potential, 20 a low potential and 3 are considered non-significant. The projects considered for cumulative impact assessment together with significance level are presented in Table 12.

**Table 12 Interaction of Projects**

Name	Type	Province	Significance
ITE pipeline	Gas pipeline	Various	High
Nabucco pipeline	Gas pipeline	Various	High
Erzincan-Erzurum	Railway	Erzurum	High
Sivas-Erzincan High-Speed Train	Railway	Sivas	High
Sivas-Erzurum High-Speed Train	Railway	Sivas – Erzurum	High
Yerköy-Sivas High-Speed Train	Railway	Yozgat- Sivas	High
Erzurum – Kars	Railway	Erzurum	High
Güllüce Irrigation Channel system	Irrigation Channel	Bursa	High
Gelibolu Gökbüet	Irrigation Channel	Edirne	High
Çokal Irrigation System	Water Line	Çanakkale	High
Bayburt Dam	Dam	Kars	High
Karakurt Dam	Dam	Kars	High
Mining Licenses	Mining Site	Various	High
Ankara-Pozantı	Highway	Ankara	Medium
E90-D750(Ankara-Konya)	Highway	Ankara	Medium
Ardahan-Hanak	Highway	Ardahan	Medium
Manyas	Highway	Balıkesir	Medium
Susurluk-Balıkesir	Highway	Balıkesir	Medium
Tavşanlı,Kütahya-Bozüyük	Highway	Bilecik	Medium
Bursa-Susurluk	Highway	Bursa	Medium
Gebze-Orhangazi-İzmir	Highway	Bursa	Medium
Ankara-İzmir	Highway	Eskişehir	Medium
Eskişehir-Antalya	Highway	Eskişehir	Medium
Günyüzü-Yunak	Highway	Eskişehir	Medium
Şenkaya-Sarıkamış	Highway	Kars	Medium
Keskin-Çelebi	Highway	Kırıkkale	Medium
Highway	Highway	Kırşehir	Medium
Kınalı-Tekirdağ-Savaştepe-Çanakkale	Highway	Tekirdağ	Medium
Ardahan-Çıldır	Railway	Ardahan	Medium
Bandırma-İzmir	Railway	Balıkesir	Medium
Bandırma-İçdaş Power Transmission Line (380 KW)	Electricity	Balıkesir	Medium
Gazdaş Pipeline	Gas Pipeline	Edirne	Medium
Bandırma Industrial Zone	Industrial Zone	Balıkesir	Medium
Taşoluk Irrigation Channel	Irrigation Channel	Çanakkale	Medium
Biga Plain Irrigation Channel	Irrigation Channel	Çanakkale	Medium
Bahçeköy Irrigation	Irrigation Channel	Edirne	Medium
Esendurak Irrigation Channel	Irrigation Channel	Erzincan	Medium
D230 (Eskişehir-Kütahya)	Highway	Eskişehir	Low
Horasan-Karakurt	Highway	Kars	Low

Name	Type	Province	Significance
Gelibolu-Unimar Power Transmission Line (380 KW)	Electricity	Çanakkale	Low
Cenal-Bandırma Power Transmission Line (380 KW)	Electricity	Çanakkale	Low
Çamoluk-Hamza-Refahiye Transmission Line (154KW)	Electricity	Erzincan	Low
Elif-Hamza Power Transmission Line (154KW)	Electricity	Erzurum	Low
Borçka-İspir-Erzurum Power Transmission Line (380KW)	Electricity	Erzurum	Low
High Tension Line	Electricity	Eskişehir	Low
İspir Power Transmission Line (380KW)	Electricity	Gümüşhane	Low
Önerler Gas Pipeline	Gas Pipeline	Çanakkale	Low
Ardahan and Kartalpınar Industrial Zone	Industrial Zone	Ardahan	Low
Mustafakemalpaşa Industrial Area	Industrial Zone	Bursa	Low
Natural Gas Combined Cycle Plant	Industrial Zone	Tekirdağ	Low
Anadolu, Karakoy and diğer Somon Fish Farms	Fish Farms	Kütahya	Low
High Tension Line	Electricity	Eskişehir	NS
Karadivan Irrigation Channel	Irrigation Channel	Erzincan	NS
Merekler and Algölü HEP	Hydroelectric Power	Ardahan	NS

After the detailed evaluation of impacts on the identified VECs, mitigation strategies have been formed and recommended for each specific interacting projects in order to decrease the significance to a certain level.

Recommended mitigations in general are as follows;

- Establish a contact with the relevant authority to determine the project construction timeline.
- Exchange information with the relevant authority in order to minimize potential interactions.
- If the project timeline overlaps with the TANAP project:
  - Establish a cooperation protocol with the relevant authority,
  - Assess in detail the cumulative impacts on specific receptors,
  - Share and align the TANAP management plans and monitoring plans with the relevant authority.

Due to the nature of the project, potential interactions are assumed to be temporary and limited with the construction phase, and therefore, cumulative impacts are not expected during operation phase.

## **5. GRIEVANCE MECHANISM AND STAKEHOLDER ENGAGEMENT**

### **5.1. GRIEVANCE MECHANISM**

Online Stakeholder Interaction Database (Darzin software) has been in use by the social Teams of TANAP, EPCM and Construction Contractors. This software is being used as a contact database for Project stakeholders as well as to record and follow-up complaints, feedbacks, requests and questions. From the beginning of the Project; 274 complaints were received, of which 223 have been closed and 40 are still open. Top 5 complaint issues recorded up-to date can be listed as; Incidents regarding Land Acquisition and Compensation Process, Outstanding Subcontractor Payments, Employee Complaints, Decrease or Loss of Livelihood & Agriculture and Damage to Property & Land.

### **5.2. STAKEHOLDER ENGAGEMENT**

#### **5.2.1. Stakeholder Engagement During ESIA Phase**

A total of 63 public participation meetings (Official & Additional) have been held during the ESIA process to inform the Project-affected communities about TANAP Project and to gather any concerns, feedbacks and suggestions to be considered in ESIA studies. The meetings were held in each district affected by TANAP Project and a total of 1250 participants attended all the meetings. Land acquisition and Project details were the mostly discussed topics in the meetings. The details of public participation meetings are compiled in a separate report ("Report for Public Participation Meetings").

Three consultation meetings with local and international NGOs were held, as part of Turkish legislation requirements, where in about 1250 people participated. A project brochure was distributed in these meetings and a power point presentation was made, and question and answer sessions were conducted.

In addition, 88 focus group meetings (with women, youngsters and fishermen) and 151 key informant interviews (with representatives of governmental and civil organizations) were carried out as part of ESIA. Additionally, 17 focus group meetings with women and 135 village head meetings were also held as part of RAP preparation. Most of the issues raised in the meetings were about the project and compensation related issues. The impacts to land and livestock, and grievance redress mechanism to deal with construction related impacts during construction were also raised. One significant issue brought out during consultations was the local employment opportunities during construction and reinstatement works. The other issues raised were gas distribution and improvements to supply, social investment in villages along the route, water quality, agriculture impacts and potential limitation on crops, waste management, damages to existing roads from construction traffic, security of pipelines as well as safety of people and animals, and health risks.

After the approval of the ESIA, a total of 83 ESIA disclosure meetings have been held to disclose outcomes of ESIA to Project-affected settlements inform them about the Project and gather any concerns. Directly affected 572 settlements were invited to the meetings and a total of 1288 participants attended all the meetings. Land acquisition and Project details were the mostly discussed topics in the meetings. The details of ESIA disclosure meetings are compiled in a separate report ("Report for ESIA Disclosure Meetings").

The Final ESIA is disclosed at TANAP web page on 22 June 2015 (pls refer [www.tanap.com/reference-documents/](http://www.tanap.com/reference-documents/)).

### **5.2.2. Stakeholder Engagement During Construction**

As part of Community Relation Plans, the Community Liaison Officers from TANAP and Supervision consultant and contractors are in place work sites. These officers engage with the villagers on ongoing basis to explain and inform them about risks and safety measures. The grievances and complaints from the villagers are also reported by these officers to TANAP and seek resolutions. Stakeholder engagement activities to be implemented during construction are detailed in Stakeholder Engagement Plan. These activities/tools include face-to-face meetings, presentations/reports, written Project brochures/updates, technical workshops, corporate website, hotline, Grievance mechanism and media advertisements.

## 6. CURRENT STATUS OF THE PROJECT

After the approval of the ESIA Report, 6 camp sites<sup>10</sup> at Kars-Selim, Erzurum-Pasinler, Erzincan-Çadırkaya, Sivas-Hafik, Yozgat-Doğankent and Ankara-Polatlı, which have already been presented in the ESIA Report, were constructed by TANAP in order for the construction contractors to be mobilized for the start of the construction of the pipeline in Lot 1, Lot 2 and Lot 3. Lot 1 starts from Ardahan/Posof/Türkgözü village ends in Erzurum/Aşkale/Toplaçavuş village, Lot 2 starts from Erzurum/Aşkale/Güneyçam village ends in Sivas/Yıldızeli/Ekecik village. Lot 3 starts from Sivas/Yıldızeli/Şeyhalil-Selçuklu quarter ends in Eskişehir/Odunpazarı/Kırvandan village. Lot 4 starts from Eskişehir/Odunpazarı/Karapazar village ends in Edirne/İpsala/Sarıçalı village.

After the signature of the contracts with Fernas İnşaat A.Ş., Sicim-Yuksel-Akkord (SYA) Joint Venture and Tekfen İnşaat ve Tesisat A.Ş. for Lot 1, Lot 2 and Lot 3 respectively; contractors submitted their own site specific health safety and environmental and sub-management plans, the guidelines of which were subject to approval of TANAP/EPCM, before mobilization to these camp sites. As soon as the mobilization of the Construction Contractors to Site was completed, Third Party Monitoring Company Environmental and Soil Experts were mobilized to each Lot for the start-up of monitoring activity on May 2015. The site activities have started in compliance with ESIA Report, BAP Report and under the assurance of the teams given in organisation charts in Section 3.3.

The progress of the Construction has been followed-up by March Charts prepared by Construction Contractors in which environmental and archaeological constraints were incorporated as well as the construction sections. Each Construction Contractor conducts their own pre-construction surveys considering the environmental and social items throughout the relevant section of the pipeline. Specific method statements and /or plans are being prepared for some specific construction activities upon identification through pre-construction surveys and requirements due to ESIA Report. The required mitigations, such as for some freshwater critical habitats and hydrotesting activities of river crossings, and seed collection, harvesting, plant translocation and reinstatement for some specific environmental activities, are defined accordingly.

During ESIA Studies, cultural heritage management investigations have been conducted on all of the identified sites by using intensive survey method. 55 of these identified 161 archaeological and cultural heritage sites were registered as Protection Sites by the Ministry of Culture and Tourism, 106 were not previously known or registered. The 106 newly discovered sites were presented to the Ministry and revisited together with the representatives of Regional Preservation Boards for Cultural Assets which act as the local authority and approximately 20% of these have been registered. Considering the current status of cultural heritage management activities, 20 chance finds were discovered during the construction activities in all Lots in compliance with the legal requirements, of some of which are small settlements, some are ancient cemeteries/graves and/or terra cotta, waterline etc. Corrective actions implemented during this process were as; stopping the site activities, informing relevant museum authority, taking the actions upon their advice, route change if required upon the evaluation of the relevant Regional Protection Board decision. Along the TANAP pipeline route, there is no above ground structure as Cultural Assets. Both chance finds and unavoidable areas are all under the ground.

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<sup>10</sup> There are two camps in each construction lot with capacity for 850 people. The work camps provide accommodation, sanitary facilities, two food cantinas, and medical and recreational facilities for workers. There is a separate accommodation for women who live in the work camps. Contractors will document that the camps' housing quarters are designed and operated according to internationally accepted health and safety standards, including such aspects as the number of occupants per room, number of sanitary facilities per worker, ventilation and temperature requirements to provide the required comfort and prevent the transmission of respiratory diseases, and similar design criteria applicable to the eating and recreational installations of the camp.

The archaeological sites that could not be avoided during routing studies are presented below in Table 13. Within these sites either test pit and salvage excavations were conducted and permission were received, or test pit and salvage excavation were conducted and route changes were done.

**Table 13 Action status follow-up table in unavoidable archaeological sites**

No	Location	Location	LOT	KP (km)	Name	Status
1	Erzurum /Horasan	Before Take Off 56 inch	LOT 1	220	DEVEAĞILI KURGANI	Test pit and salvage excavations were completed/ Route permission was received.
2	Erzurum / Yakutiye	Before Take Off 56 inch	LOT 1	307	TASMASOR II	Test pit and salvage excavations were conducted/ Then, Route Change was done.
3	Erzurum / Pasinler	Before Take Off 56 inch	LOT 1	272	DEMİRDÖVEN	Test pit and salvage excavations were completed/ Route permission was received.
4	Eskişehir / Center	After Take Off 48 inch	LOT 4	1369	EMİR ÇİFTLİĞİ-1 (1 st degree)	Test pit and salvage excavations completed/ Route permission was received.
5	Eskişehir / Sivrihisar	Before Take Off 56 inch	LOT 3	1245	ÖRENBAĞLARI	Test pits were opened. Then, route change was done.
4	Eskişehir / Center	After Take Off 48 inch	LOT 4	1369	EMİR ÇİFTLİĞİ-2 (3 rd Degree)	Test pit and salvage excavations were completed/ Route permission was received.
6	Balıkesir / Gönen	After Take Off 48 inch	LOT 4	1671	Kavaktepe 3 rd Degree	Test pit was opened and permission was received.
7	Balıkesir / Manyas	After Take Off 48 inch	LOT 4	1632	Şevketiye 3 rd Degree	Test pit and salvage excavations were conducted/ Route Change was done.
8	Erzurum /	Before Take Off 56 inch	LOT 1	300	Dolangez Bastion	Test pits were opened and permission was received.
9	Balıkesir / Manyas	After Take Off 48 inch	LOT 4	1628	Hamamlı 1st and 3 rd Degree	Test pits were opened and route change was done.
10	Balıkesir / Manyas	After Take Off 48 inch	LOT 4	1627	Kalebayırı 1st and 2 nd Degree	Test pit and salvage excavations were conducted/ Route Change was done.
11	Balıkesir / Gönen	After Take Off 48 inch	LOT 4	1673	Kınalar 1st Degree	Test pits were opened, the archaeological settlement was prevented with a route change, remaining still inside the archaeological site. Permission was received.

As a result, route change was implemented wherever possible. In some of the locations, permissions were received for the areas, which were judged to be not of high value site by the authority. Therefore, the excavated sections were closed. In the locations where route change was presented not to be conducted, it was identified that there is no archaeology potential and the borders of the archaeological site has been kept wider to be on the safe side.

LOT-4 Onshore 48" Pipeline Contract has been awarded to Punj Lloyd Ltd. - Limak İnşaat Sanayi ve Ticaret A.Ş. on 25 January 2016. Stations Construction Contract has been awarded to Tekfen İnşaat ve Tesisat A.Ş. on 17 February 2016. Telecom/SCADA Contractor (TSC) has been awarded to ABB Elektrik Sanayi A.Ş. on 26 October 2015. Regarding the off-shore contract, the bids have been received from relevant qualified contractors, which is currently under the technical and commercial evaluation.

The environmental and social safeguards due-diligence study of the WB is nearing completion. Based on the review to date, there may be the need for some minor revisions or supplementation of the ESIA or related documentation, which will be completed during WB's Project Appraisal Stage. For example, one area where supplementary information may be needed is specifying mitigation measures for avoiding entry of invasive species into the temporarily disturbed critical habitats. Alien invasive species guidance note was prepared and implementation practices will be revised according to the agreed actions to be decided by WB and TANAP teams.

## 7. LAND ACQUISITION AND RAP

**Land Acquisition Impacts:** Though, the project requires large scale land acquisition (about 5000 hectares of private and 2200 hectares of public lands), most of the lands required for pipeline construction are being obtained on unrestricted exclusive rights basis for pipeline construction corridor of 16 meters, on temporary easement basis (for about 3 years) for 20 meter construction contract corridor and the permanent land acquisition on ownership basis for the above ground installations (AGIs) which is expected to be only a small proportion. Total number of affected land owners is estimated to be about 95.000 and include some informal settlers of about 200 families cultivating public lands. Since most of the land acquisition is for a temporary period of about 3 years, the impact of land acquisition is not considered a major issue in this project. Further, the physical displacement is unlikely or very minimum, mostly for AGIs. The acquisition of public lands includes forest, pasture and village common lands.

**Land Valuation:** The compensation valuation is clearly defined by the Land Acquisition Law; includes considerations of net income, capitalization and sale transaction from Title Registration office and real estate prices, etc. The compensation for 16 meters corridor corresponding to long term of exclusive rights basis is the range of 70-90% of the compensation as available under permanent land acquisition, In case of 20 meters of temporary easement rights that will be used only for construction period, the compensation is estimated around 20% of the permanent land acquisition. This applies to all each and every land owner on acquired parcels depending on the user rights established on the parcel. Although the Land Acquisition Law does not stipulate, an additional amount for net income loss due to productivity loss in construction corridor 36m estimated at 30% for first year, 20% for second year and 10% for third year is also paid by the project referring to best international practice (i.e.RAP) in order to encourage amicable agreements and minimize effect of construction. At the same time, the valuation amounts are also subjected to control and approval by an independent entity before implementation, i.e. Yıldız Technical University, in order to secure a fair and transparent assignment. In addition, as referenced in Section 2.2, a RAP Fund has been introduced to the Project as a central mechanism in parallel to land acquisition by which to address the gaps between Turkish legislation requirements and international guidelines with respect to compensating for land acquisition for the pipeline. The RAP Fund has been introduced by TANAP to specifically ensure a fair and transparent valuation and compensation process for the non-eligible users (users that are directly/indirectly affected by the project but can not be compensated through the legal process by BOTAS) during the ongoing land acquisition process. This includes squatters on public lands as well as commonly used lands.

A Resettlement Action Plan (RAP)<sup>11</sup> has been prepared and is under implementation for pipeline construction. The full version of RAP is available at TANAP web page ([www.tanap.com/reference-documents/](http://www.tanap.com/reference-documents/)) and under WB due diligence review. The RAP presents the overall impacts, policy and legislative framework, land acquisition process, consultations and disclosure details and implementation arrangements, indicative implementation schedules and budgets with supporting details in the attachments. The house hold survey has been carried out among a sample 876 households with 481 Kms (about 25% of the pipeline route) and the RAP also includes the socio-economic characteristics of affected population and an outcome of consultations and focus group discussions. As on date, 64% of required private land for pipe line construction is completed and about 62% of about 95,000 affected

<sup>11</sup> The World Bank, as part of its proposed financing, is carrying out a due diligence on the policy provisions, implementation arrangements and risks associated with the land acquisition and its related impacts. Simultaneously, TANAP has commissioned an independent consultant to assess the RAP implementation. Based on the outcome of the due diligence process and RAP assessment report, TANAP will prepare an Addendum to RAP to propose measures to adjust in the implementation of remaining land acquisition impacts and include additional support for livelihood improvement especially to the poor and vulnerable groups, as needed to meet the standards of World Bank's Operational Policy 4.12 on Involuntary Resettlement

land owners have received compensation<sup>12</sup>. The compensation provided is expected to take care of the temporary livelihood impacts during the temporary 3 year period. The neediest people will be assisted with jobs with contractors to supplement the household incomes. The land acquisition assessment and preparation of RAP for AGIs has been initiated. The draft RAP for AGIs will be prepared by mid-August 2016 and finalised and disclosed by mid-September 2016. The entitlements for land acquisition impacts and assistance available for pipeline impacts will be suitably updated to reflect the impacts in the permanent land acquisition and thus ensure compensation and assistance in line with the World Bank's operational policy on Involuntary Resettlement.

## **8. SOCIAL AND ENVIRONMENTAL INVESTMENT PROGRAMS<sup>13</sup>**

The main objective of the Social and Environmental Investment Programme is to contribute to economic and social development and protection of natural resources by establishing a harmonious unity with the ecosystem throughout TANAP pipeline route. The purpose of this program is to maintain good community relations with the neighbourhood villages where the pipeline route is passing through and create sustainable development for local populations, and steadily improve the quality of life including Social and Environmental aspects during the construction and operations phases of the TANAP Project. TANAP's priorities under this program regarding social side are: (i) Supporting of tourism service diversification investment such as agro-tourism; (ii) Equipment supports to schools, libraries, sport areas and common social areas; (iii) Supporting of penetration and increasing quality of health services in rural areas ; (iv) Increasing the capacity of vocational centres; (v) Increasing product diversification, value added and productivity in agriculture ; (vi) Supporting of production local and traditional products . On environment side, the program will focus on : (i) sustainable management of natural resources, soil and water; (ii) development and efficient usage of renewable energy resources; (iii) management of environmental infrastructure and increasing awareness on environment; (iv) supporting of breed medical and aromatic plants and economic usage; (v) protecting and developing bio-diversification and eco-systems; (vi) supporting of social capital investments.

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<sup>12</sup> Since substantial land acquisition has been completed, TANAP has commissioned an independent consultant firm to assess the outcome of RAP implementation experiences including land owners satisfaction with land acquisition process and compensation received. Based on study findings any adjustments required in the remaining implementation will be made.

<sup>13</sup> These programs are intended to maintain good neighborhood relations and are not for mitigating adverse social impacts.

SEIP funding will be mainly based on a grants scheme, which is a "completely non-refundable support type". According to the outputs of the Needs Analysis Study, priority investment areas were defined both for social and environmental disciplines. Within this context, the total budget will be allocated to the beneficiary institutions and will be performed through three support mechanisms as:

1. Direct Grant
2. Direct Investment
3. Programme Contribution

**Direct Grant Programmes:** Grant system is basically defined by a method of choosing potential local institutions that are allowed to benefit from the grant mechanism by gathering project proposals in accordance with established procedures and evaluation criteria. In this context, TANAP will announce Call for Proposals and evaluate the submitted project proposals.

**Direct Investment Programmes:** Direct investment programmes are based on the principle of regionally selected beneficiary institutions to propose their projects through open invitation. Then, the parties (TANAP and the applying party/beneficiary institution) evaluate the projects mutually and finalise negotiation/the agreement.

**Programme Contribution as support programmes:** Unlike the open calling system for grant aid, this mechanism consists of financial support to transfer to programmes through projects submitted by beneficiary institutions on provincial/regional level with open invitation procedure, including evaluating mutual projects, based on implementation principles approved and determined between the organizations that provide the project with TANAP.

#### **TANAP CONTACT INFORMATION**

The contact details are presented below for any queries and feedbacks about TANAP Project:

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# **ANNEXES**

## Annex 1. Terrestrial Critical Habitat Assessment

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH1	003+000-003+735	0,735	M	Ardahan	POSOF WDA + POSOF PBA+POSOF FOREST (KBA)	Criterion 4	G1.A	H	<i>Zygaena armena</i> <b>(Arthropoda)</b>	M	Criterion 2	Tier 2 (b)	Criterion 2 & 4	L	<p>* Closed construction period: 1 May-1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Reseda armena var. armena</i>)</b> * The top soil between 003+000-003+735 KP's should be scraped at a depth of 10-15 cm and should be stored near the ROW. The seeds of <i>Reseda armena var. armena</i> shall be collected near the ROW between 15 July-30 August.</p> <p><b>For Arthropoda species (<i>Zygaena armena</i>)</b> * The seeds of <i>Coronilla</i> and <i>Onobrychis</i> species, which are the feeding plants of <i>Zygaena armena</i> shall be collected near the ROW between 15 July-30 August.</p> <p><b>For Amphibia Species (<i>Mertensiella caucasica</i>)</b> * At the beginning of April, a field study should be carried out by experts, and if <i>Mertensiella caucasica</i> will be observed, individuals should be carried to the appropriate and close aquatic areas by specialists according to the methodology. * If <i>Mertensiella caucasica</i> species will be observed in the ROW, the construction works cannot be done before the April, because this species is going to hibernation. * If <i>Mertensiella caucasica</i> species is observed in the area, it should be ensured that the habitat is restored by restoring the stones and rocks in and near the aquatic environment after construction.</p> <p><b>For Habitat</b> * The top soil between 003+000-003+735 KP's should be scraped at a depth of 10-15 cm and should be stored near the ROW. * The seeds of the non-endemic native plants of the region shall be collected. * The seeds of non-endemic native plants shall be planted on the ROW for erosion control in dip slopes after construction works.</p>
							G1.1	M	<i>Reseda armena var. armena</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Mertensiella caucasica</i> Caucasian Salamander <b>(Amphibia)</b>	M	Criterion 2	Tier 2 (b)			

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH2	003+940-004+051	0,111	M	Ardahan	POSOF WDA + POSOF PBA+POSOF FOREST (KBA)	Criterion 4	G1.A G1.1 E4.4	H M M	<i>Zygaena armena</i>	M	Criterion 2	Tier 2 (b) Tier 2 (b) Tier 2 (b)	Criterion 2 & 4	L	<p>* Closed construction period: 1 May-1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Reseda armena var. armena</i>)</b></p> <p>* The top soil between 003+000-003+735 KP's should be scraped at a depth of 10-15 cm and should be stored near the ROW.</p> <p>The seeds of <i>Reseda armena var. armena</i> shall be collected near the ROW between 15 July-30 August.</p> <p><b>For Arthropoda species (<i>Zygaena armena</i>)</b></p> <p>* The seeds of <i>Coronilla</i> and <i>Onobrychis</i> species, which are the feeding plants of <i>Zygaena armena</i> shall be collected near the ROW between 15 July-30 August.</p> <p><b>For Amphibia Species (<i>Mertensiella caucasica</i>)</b></p> <p>* At the beginning of April, a field study should be carried out by experts, and if <i>Mertensiella caucasica</i> will be observed, individuals should be carried to the appropriate and close aquatic areas by specialists according to the methodology.</p> <p>* If <i>Mertensiella caucasica</i> species will be observed in the ROW, the construction works cannot be done before the April, because this species is going to hibernation.</p> <p>* If <i>Mertensiella caucasica</i> species is observed in the area, it should be ensured that the habitat is restored by restoring the stones and rocks in and near the aquatic environment after construction.</p> <p>* The seeds of non-endemic native plants shall be planted on the ROW for erosion control in dip slopes after construction works.</p> <p><b>For Habitat</b></p> <p>* The top soil between 003+940-004+051 KP's should be scraped at a depth of 10-15 cm and should be stored near the ROW.</p> <p>* The seeds of the non-endemic native plants of the region shall be collected.</p> <p>* The seeds of non-endemic native plants shall be planted on the ROW for erosion control in dip slopes after construction works.</p>
									<i>Reseda armena var. armena</i>	M	Criterion 2				
									<i>Mertensiella caucasica</i> Caucasian Salamander	M	Criterion 2				
CH3	20+700-23+000	2,3	H	Ardahan	POSOF WDA + POSOF FOREST (KBA)	Criterion 4	G1.9  E2.1  E4.4	H  M  M	<i>Tipula n.sp</i>	H	Criterion 2	Tier 1 (a)	Criterion 2 & 4	L	<p>* Closed construction period: 1 June-1 July because of the vegetation period of flora species.</p> <p><b>For Flora Species (<i>Centaurea macrocephala</i> and <i>Lilium kesselringianum</i>)</b></p> <p>* The top soil shall be scraped at a depth of 10-15 cm between 20+700-23+000 KP's and shall be stored near the ROW.</p> <p>* The seeds of <i>Centaurea macrocephala</i> species shall be collected near the ROW between 15 July-30 August.</p> <p>* The bulbs of <i>Lilium kesselringianum</i> shall be collected between (21+529-22+070) KP's before or during the top soil scraping and shall be stored near the ROW.</p> <p><b>For Arthropoda Species (<i>Erebia ottomana</i>)</b></p> <p>* The areas which Poaceae is very dense (between 20+725-21+078 / 22+235-22+615 KP's) shall be harvested and shall be stored near the ROW.</p> <p><b>For Habitat</b></p> <p>* The top soil shall be scraped at a depth of 10-15 cm between 20+700-23+000 KP's and shall be stored near the ROW.</p>
									<i>Centaurea macrocephala</i>	M	Criterion 2	Tier 2 (b)			
									<i>Erebia ottomana</i>	M	Criterion 2	Tier 2 (b)			
									<i>Ottoman Ringlet</i> (Arthropoda / Butterfly)	H	Criterion 2	Tier 2 (b)			
								<i>Lilium kesselringianum</i>							

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH4	23+670-27+081	3,411	M	Ardahan	POSOF WDA + POSOF FOREST (KBA)	Criterion 4	E4.4	M	<i>Prometheomys schaposchnikowi</i> <b>Long-clawed Mole Vole (Mammalia)</b>	H	Criterion 2	Tier 2 (b)	Criterion 2 & 4	L	<p>* Closed construction period: 15 May-15 August because of breeding period for <i>Prometheomys schaposchnikowi</i></p> <p><b>For Mammalian Species (<i>Prometheomys schaposchnikowi</i>)</b></p> <p>* The top soil shall be scraped at a depth of 10-15 cm between 23+670-27+081KP's and shall be stored near the ROW.</p> <p>* <i>Prometheomys schaposchnikowi</i> individuals shall be carried to the appropriate and close areas by specialists according to the methodology.</p> <p>* When the nest gallery system is being excavated, the nest material and the stored food found in the nest should also be carried to the new transferred nesting area and should be placed inside the gallery entrance so that the members can take them in their new nests they are building.</p> <p><b>For Habitat</b></p> <p>* The top soil shall be scraped at a depth of 10-15 cm between 23+670-27+081KP's and shall be stored near the ROW.</p>
CH5	62+320-63+140	0,82	H	Ardahan	ARDAHAN FOREST (IBA, KBA)	Criterion 4	E4.4	M	<i>Lathyrus karsianus</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)	Criterion 1, 2 & 4	L	<p>* Closed construction period: 1 June-15 July because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Lathyrus karsianus</i>, <i>Tanacetum coccineum ssp. chamaemelifolium</i>)</b></p> <p>* The top soil between 62+320-63+140 KP's shall be scraped at a depth of 10-15 cm with the plants on it as tufts (including <i>Sanguisorba</i> sp.), and shall be stored near the ROW, and shall be irrigated once every two weeks.</p> <p>*The seeds of <i>Lathyrus karsianus</i> species shall be collected near the ROW between 1 July-1 August; the seeds of</p>
						G1.9	H	<i>Tanacetum coccineum ssp. chamaemelifolium</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)				
						G3.F	L	<i>Phengaris nausithous</i> <b>Dusky Large Blue (Arthropoda / Butterfly)</b>	H	Criterion 1	Tier 2 (e)				
						G3.4	H	<i>Tipula n.sp</i> <b>(Arthropoda)</b>	H	Criterion 2	Tier 1 (a)				

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
							E2.1	M	<i>Erebia ottoman</i> <b>Ottoman Ringlet (Arthropoda)</b>	M	Criterion 2	Tier 2 (b)			<p><i>Tanacetum coccineum ssp. chamaemelifolium</i> species shall be collected near the ROW between 15 July-15 August.</p> <p><b>For Arthropoda Species (<i>Phengaris nausithous</i>, <i>Erebia ottomana</i>, <i>Tipula n.sp</i>)</b></p> <p>* The top soil between 62+320-63+140 KP's shall be scraped at a depth of 10-15 cm with the plants on it as tufts (including <i>Sanguisorba</i> sp.), and shall be stored near the ROW, and shall be irrigated once every two weeks.</p> <p>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</p> <p>* Herbaceous plants shall be harvested and stored near the ROW.</p> <p><b>For Habitat</b></p> <p>* The top soil between 62+320-63+140 KP's shall be scraped at a depth of 10-15 cm with the plants on it as tufts (including <i>Sanguisorba</i> sp.), and shall be stored near the ROW, and shall be irrigated once every two weeks.</p> <p>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</p>
CH6	84+758-	2,242	H	Ardahan	-	-	E4.4	M	<i>Phengaris nausithous</i>	H	Criterion 1	Tier 2 (e)	Criterion 1 &	L	<b>For Arthropoda Species (<i>Phengaris nausithous</i>)</b>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
	87+000								<b>Dusky Large Blue (Arthropoda / Butterfly)</b>		Criterion 2	Tier 2 (b)	2		<ul style="list-style-type: none"> <li>* The top soil between 84+758-87+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</li> <li>* The seeds of <i>Sanguisorba</i>, which is the feeding plant of <i>Phengaris nausithous</i>, shall be collected near the ROW.</li> <li>* Top soil shall be scraped at a depth of 10-15 cm with the plants on it as tufts (including <i>Sanguisorba</i> sp.), and shall be stored near the ROW, and shall be irrigated once every two weeks if the construction works start at summer.</li> <li>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</li> </ul> <p><b>For Habitat</b></p> <ul style="list-style-type: none"> <li>* The top soil between 84+758-87+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</li> <li>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</li> </ul>
CH7	115+393-116+000	0,607	H	Kars	ALLAHUEKBER MOUNTAINS (KBA)	Criterion 4	E4.4 E3.4	M M	<i>Phengaris nausithous</i> <b>Dusky Large Blue (Arthropoda / Butterfly)</b>	H	Criterion 1 Criterion 2	Tier 2 (e) Tier 2 (b)	Criterion 1, 2 & 4	L	<p><b>For Arthropoda Species (<i>Phengaris nausithous</i>)</b></p> <ul style="list-style-type: none"> <li>* The top soil between 115+393-116+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</li> <li>* The seeds of <i>Sanguisorba</i>, which is the feeding plant of <i>Phengaris nausithous</i>, shall be collected near the ROW.</li> <li>* Top soil shall be scraped at a depth of 10-15 cm with the plants on it as tufts (including <i>Sanguisorba</i> sp.), and shall be stored near the ROW, and shall be irrigated once every two weeks if the construction works start at summer.</li> <li>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</li> </ul> <p><b>For Habitat</b></p> <ul style="list-style-type: none"> <li>* The top soil between 115+393-116+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</li> <li>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</li> </ul>
CH8	116+069-	0,568	H	Kars	ALLAHUEKBER	Criterion 4	E4.4	M	<i>Phengaris nausithous</i>	H	Criterion 1	Tier 2 (e)	Criterion 1, 2	L	<b>For Arthropoda Species (<i>Phengaris nausithous</i>)</b>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH9	116+637				MOUNTAINS (KBA)		E3.4 E2.1	M M	<b>Dusky Large Blue (Arthropoda / Butterfly)</b>		Criterion 2	Tier 2 (b)	& 4		<p>* The top soil between 116+069-116+637 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Sanguisorba</i>, which is the feeding plant of <i>Phengaris nausithous</i>, shall be collected near the ROW.</p> <p>* Top soil shall be scraped at a depth of 10-15 cm with the plants on it as tufts (including <i>Sanguisorba</i> sp.), and shall be stored near the ROW, and shall be irrigated once every two weeks if the construction works start at summer.</p> <p>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</p> <p><b>For Habitat</b></p> <p>* The top soil between 116+069-116+637 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil.</p>
	164+345-164+566	0,221	M	Kars	-	-	E1.2E	H	<i>Darevskia uzzelli</i>	H	Criterion 1	Tier 2 (e)	Criterion 1 & 2	L	<p>* Closed prior to 15th of July because of the species hibernation period</p> <p><b>For Reptilian Species (<i>Darevskia uzzelli</i>, <i>Darevskia unisexualis</i>)</b></p> <p>* The top soil between 164+345-164+566 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* <i>Darevskia uzzelli</i> and <i>Darevskia unisexualis</i> individuals shall be carried to the appropriate and close areas by specialists according to the methodology at the beginning of the July.</p> <p>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil</p> <p><b>For Habitat</b></p> <p>* The top soil between 164+345-164+566 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil</p>
									<b>Uzzell's Lizard (Reptilia)</b>		Criterion 2	Tier 2 (b)			
								<i>Darevskia unisexualis</i>	H	Criterion 2	Tier 2 (b)				
CH10	167+000-167+154	0,154	M	Kars	-	-	E1.2E	H	<i>Darevskia uzzelli</i>	H	Criterion 1	Tier 2 (e)	Criterion 1 & 2	L	<p>* Closed prior to 15th of July because of the species hibernation period</p> <p><b>For Reptilian Species (<i>Darevskia uzzelli</i>, <i>Darevskia unisexualis</i>)</b></p>
								<b>Uzzell's Lizard (Reptilia)</b>		Criterion 2	Tier 2 (b)				

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH11									<i>Darevskia unisexualis</i> <b>Unisexual Lizard (Reptilia)</b>	H	Criterion 2	Tier 2 (b)			* The top soil between 167+000-167+154 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * <i>Darevskia uzzelli</i> and <i>Darevskia unisexualis</i> individuals shall be carried to the appropriate and close areas by specialists according to the methodology at the beginning of the July. * Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil <b>For Habitat</b> * The top soil between 167+000-167+154 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil
	169+000-174+000	5	M	Kars	SARIKAMIŞ FOREST (IBA, KBA)	Criterion 4	E3.4 G3.4 G3.F	M H L	<i>Otis tarda</i> <b>The great bustard (Bird)</b>	M	Criterion 1	Tier 2 (d)	Criterion 1 & 4	L	<b>For Bird Species (<i>Otis tarda</i>)</b> * If the <i>Otis tarda</i> individuals will be seen, they shall be removed from the area by specialists. * If the nest, eggs or mature individuals in the incubation will be seen, the construction works shall be stopped until the chicks feed themselves. * The top soil between 169+000 - 174+000 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * If adult <i>Otis tarda</i> individuals are observed, they shall be removed by specialist. * If incubating adults or nests or eggs of <i>Otis tarda</i> are observed, construction shall be stopped and is prohibited until eggs hatch and the chicks feed themselves * If adult <i>Otis tarda</i> individuals are observed, they shall be removed by specialist. * If incubating adults or nests or eggs of <i>Otis tarda</i> are observed, construction shall be stopped and is prohibited until eggs hatch and the chicks feed themselves <b>For Habitat</b> * The top soil between 169+000 - 174+000 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH12	174+412-176+000	1,588	H	Kars	SARIKAMIŞ FOREST (IBA, KBA)	Criterion 4	G3.4 G3.F	H L	<i>Eulasia chrysopyga</i> <b>(Arthropoda)</b> <i>Hieracium sarykamyschense</i> <b>(Flora)</b>	M H	Criterion 2 Criterion 1	Tier 2 (b) Tier 2 (d)	Criterion 1, 2 & 4	L	* Closed construction period: 1 June-1 July because of the vegetation period of flora species <b>For Flora Species (<i>Hieracium sarykamyschense</i>)</b> * The top soil between 174+412-176+000 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Hieracium sarykamyschense</i> species shall be collected near the ROW between 15 July-15 August. <b>For Arthropod Species (<i>Eulasia chrysopyga</i>) and for habitat</b> * The top soil between 174+412-176+000 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH13	187+557-193+000	5,443	M	Kars	SARIKAMIŞ FOREST (IBA, KBA)	Criterion 4	E4.4 G3.4 E2.1 E3.4	M H M M	<i>Lathyrus karsianus</i> <b>(Flora)</b> <i>Eulasia chrysopyga</i> <b>(Arthropoda)</b> <i>Phengaris nausithous</i> <b>Dusky Large Blue (Arthropoda / Butterfly)</b> <i>Zonitis nigriventris</i> <b>(Arthropoda)</b>	M M H M	Criterion 2 Criterion 2 Criterion 1 Criterion 2 Criterion 2	Tier 2 (b) Tier 2 (b) Tier 2 (e) Tier 2 (b) Tier 2 (b)	Criterion 1, 2 & 4	L	* Closed construction period: 1 June-1 July because of vegetation period of the flora species <b>For Flora Species (<i>Lathyrus karsianus</i>, <i>Hieracium sarykamyschense</i>)</b> * The top soil between 187+557 - 193+000 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Lathyrus karsianus</i> and <i>Hieracium sarykamyschense</i> species shall be collected near the ROW

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH14							G3.F	L	<i>Hieracium sarykamyschense</i> (Flora)	H	Criterion 1	Tier 2 (d)			between 1 July-1 August <b>For Fauna Species (<i>Eulasia chrysopyga</i>, <i>Phengaris nausithous</i>, <i>Zonitis nigriiventris</i>)</b> * The top soil between 187+557 - 193+000 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW * Tall plants belonging to the <i>Compositae</i> , <i>Labiatae</i> , <i>Leguminosae</i> families in the area shall be harvested at the end of August, at the end of the vegetation period from the between (191+117-191+251 / 191+690-191+947) KP's and shall be stored nearby the construction site. * Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil <b>For Habitat</b> * The top soil between 187+557 - 193+000 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW * Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil
	202+930-203+709	0,779	M	Kars	-	-	E4.4	M	<i>Zonitis nigriiventris</i> (Arthropoda)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	<b>For Arthropoda species (<i>Zygaena armena</i>)</b> * The top soil between 202+930-203+709 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Tall plants belonging to the <i>Compositae</i> , <i>Labiatae</i> , <i>Leguminosae</i> families in the area shall be harvested at the end of the vegetation period from the between (202+930-203+709) KP's and shall be stored nearby the construction site. <b>For Habitat</b> * The top soil between 202+930-203+709 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW
CH15	214+885-219+641	5,641	M	Erzurum	-	-	E1.2E	H	<i>Montivipera wagneri</i> <b>Wagner's Viper</b> (Reptilia)	H	Criterion 1	Tier 2 (c)	Criterion 1 & 2	L	* Closed construction period: 1 March – 15 July because of the vegetation period of flora species and hibernation period of reptilian species <b>For Flora Species (<i>Salvia huberi</i>, <i>Cephalaria sparsipilosa</i>, <i>Eryngium wanaturi</i>, <i>Cousinia bicolor</i>)</b> * The top soil between 214+885-219+641 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Salvia huberi</i> species shall be collected from the ROW between 1 July-1 August and the seeds of <i>Cephalaria sparsipilosa</i> , <i>Eryngium wanaturi</i> and <i>Cousinia bicolor</i> species shall be collected from the ROW between 15 July-15 August. <b>For Reptilia Species (<i>Montivipera wagneri</i>)</b> * <i>Montivipera wagneri</i> individuals shall be carried to the
							E2.1	M	<i>Salvia huberi</i> (Flora)	H	Criterion 2	Tier 2 (b)			
							E4.4	M	<i>Cephalaria sparsipilosa</i> (Flora)	M	Criterion 2	Tier 2 (b)			
								M	<i>Eryngium wanaturi</i> (Flora)	M	Criterion 2	Tier 2 (b)			
								H	<i>Polyommatus merhaba</i> <b>Hi Blue</b> (Arthropoda – Butterfly)	H	Criterion 1	Tier 2 (e)			
	H	<i>Cousinia bicolor</i>	H	Criterion 1	Tier 2 (d)										

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH16									(Flora)		Criterion 2	Tier 2 (b)			appropriate and close areas by specialists according to the methodology and to the (38 T 268212.00-4446232.00) coordinates at the beginning of the July. * Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil. <b>For Arthropoda Specie (<i>Polyommatus merhaba</i>)</b> * The seeds of <i>Onobrychis</i> and <i>Astragalus</i> flora species shall be collected from the ROW between 15 July – 30 August. * Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil. <b>For Habitat</b> * The top soil between 214+885-219+641 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Stones and rocks of 30 cm or larger on the soil shall be stored nearby the construction site, without mixing them with the top soil. * In the regions between the (219+415-219+540) KP's terracing shall be carried out to prevent erosion.
	232+172-232+787	0,615	M	Erzurum	-	-	E1.2E	H	<i>Cousinia bicolor</i> (Flora)	H	Criterion 1 Criterion 2	Tier 2 (d) Tier 2 (b)	Criterion 1 & 2	L	<b>For Flora Specie (<i>Cousinia bicolor</i>)</b> * The top soil between 232+172-232+787 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. *The seeds of <i>Cousinia bicolor</i> species shall be collected near the ROW between 15 July-15 August. <b>For Habitat</b> * The top soil between 232+172-232+787 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH17	306+365-312+319 (except highway)	5,873	H	Erzurum	ERZURUM MARSHES BUFFER ZONE (WETLAND, KBA)	Criterion 4	E6.2 E1.2E	M H	<i>Hilara n. sp. 1</i> (Arthropoda) <i>Vanellus gregarius</i> The sociable lapwing (Bird)	H H	Criterion 2 Criterion 1 Criterion 3	Tier 1 (a) Tier 2 (c) Tier 2 (b)	Criterion 1, 2, 3 & 4	L	* Closed construction period: March and between 15 September-30 October because of the migration period of bird specie <b>For Flora Species (<i>Lepidium caespitosum</i>)</b> * The top soil between 306+365-312+319 (except highway,

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
							E3.4	M	<i>Lepidium caespitosum</i> (Flora)	M	Criterion 2	Tier 2 (b)			<p>0,081 m) shall be scraped at a depth of 10-15 cm and shall be stored near the ROW with harvested wet meadows with their soil if construction works starts in spring.</p> <p>* The top soil between the (306+365-306+460) KP's shall be removed in layers of 10-15 cm depth, together with the plants on it, and shall be stored nearby the construction site and shall be irrigated once every two weeks if construction works start at spring or autumn.</p> <p>* The seeds of <i>Lepidium caespitosum</i> species shall be collected between 15 July-15 August.</p> <p><b>For Arthropod Species (<i>Hilara n. sp. 1</i>)</b></p> <p>* The top soil between 306+365-312+319 (except highway, 0,081 m) shall be scraped at a depth of 10-15 cm and shall be stored near the ROW with harvested wet meadows with their soil if construction works starts in spring.</p> <p>* The top soil between the (306+365-306+460) KP's shall be removed in layers of 10-15 cm depth, together with the plants on it, and shall be stored nearby the construction site and shall be irrigated once every two weeks if construction works start at spring or autumn.</p> <p><b>For Bird Species (<i>Vanellus gregarius</i>)</b></p> <p>No construction activities should be carried out in March and between 15 September-30 October, when it is the migration periods.</p> <p><b>For Habitat</b></p> <p>* The top soil between 306+365-312+319 (except highway, 0,081 m) shall be scraped at a depth of 10-15 cm and shall be stored near the ROW with harvested wet meadows with their soil if construction works starts in spring.</p> <p>* The top soil between the (306+365-306+460) KP's shall be removed in layers of 10-15 cm depth, together with the plants on it, and shall be stored nearby the construction site and shall be irrigated once every two weeks if construction works start at spring or autumn.</p>
CH18	369+037-369+126	0,089	H	Erzurum	-	-	E1.00	H	<i>Thymus canoviridis</i> (Flora)	H	Criterion 2	Tier 2 (b)	Criterion 2	L	<p><b>For Flora Species (<i>Thymus canoviridis</i>)</b></p> <p>* The top soil between 369+037-369+126 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* <i>Thymus canoviridis</i> species shall be collected near the ROW between 15 July-15 August.</p> <p>* The <i>Thymus canoviridis</i> species individuals shall be collected as tufts and shall be transferred to the (37 S 642551.00-423058.00) coordinates between 15 July-15 August.</p> <p><b>For Habitat</b></p> <p>* The top soil between 369+037-369+126 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* Gypsum rocks excavated during activity shall be stored nearby the construction site.</p>
CH19	385+169-	4,831	M	Erzurum	-	-	E1.2E	H	<i>Polyommatus antidorus</i>	H	Criterion 2	Tier 2 (b)	Criterion 2	L	<b>For Arthropoda Species (<i>Polyommatus antidorus</i>)</b>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH20	390+000						G1.7	M	Anatolian Furry Blue (Arthropoda – Butterfly)						<p>* 20 cm of top soil between 385+169-390+000 KP's of the ROW (which is ant's nest depth) shall be scraped 15 days before the construction works and shall be stored near the ROW.</p> <p>* The stones and rocks shall be stored nearby the construction site.</p> <p>* The seeds of the plants of the <i>Onobrychis</i> and <i>Astragalus</i> genus, which are the food plants of the larvae, shall be collected between 15 July – 30 August.</p> <p><b>For Habitat</b></p> <p>* 20 cm of top soil between 385+169-390+000 KP's of the ROW (which is ant's nest depth) shall be scraped 15 days before the construction works and shall be stored near the ROW.</p> <p>* The stones and rocks shall be stored nearby the construction site.</p>
	393+489-394+339	0,85	M	Erzincan	-	-	E1.2E	H	<i>Zonitis nigriventris</i> (Arthropoda)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	<p><b>For Arthropoda Species (<i>Zonitis nigriventris</i>)</b></p> <p>* The top soil between 393+489-394+339 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* Tall plants belonging to the <i>Compositae</i>, <i>Labiatae</i>, <i>Leguminosae</i> families in the area shall be harvested at the end of August, at the end of the vegetation period and shall be stored nearby the construction site.</p> <p><b>For Habitat</b></p> <p>* The top soil between 393+489-394+339 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>
	432+592-434+819	2,227	M	Erzincan	-	-	E1.2E	H	<i>Salvia huberi</i> (Flora) <i>Cousinia halyensis</i> (Flora)	H M	Criterion 2 Criterion 2	Tier 2 (b) Tier 2 (b)	Criterion 2	L	<p><b>For Flora Species (<i>Salvia huberi</i>, <i>Cousinia halyensis</i>)</b></p> <p>* The top soil between 432+592-434+819 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Salvia huberi</i> species shall be collected between 1 July-1 August, the seeds of <i>Cousinia halyensis</i> species shall be collected between 15 July-15 August.</p> <p><b>For Habitat</b></p> <p>* The top soil between 432+592-434+819 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW</p>
CH22	451+458-454+120	2,662	M	Erzincan	-	-	E1.2E	H	<i>Isatis glauca ssp. sivasica</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	<p><b>For Flora Species (<i>Isatis glauca ssp. sivasica</i>)</b></p>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH23									<i>Polyommatus actis</i> <b>Actis Blue</b> (Arthropoda – Butterfly)	H	Criterion 2	Tier 2 (b)			<p>* 20 cm of top soil between 451+458-454+120 KP's of the ROW (which is ant's nest depth) shall be scraped together with rocks and stones 15 days before the construction works and shall be stored near the ROW.</p> <p>* The seeds of <i>Isatis glauca ssp. sivasica</i>, <i>Onobrychis</i> and <i>Astragalus</i> species shall be collected between 15 July-15 August.</p> <p><b>For Arthropoda Species (<i>Polyommatus actis</i>)</b></p> <p>* 20 cm of top soil between 451+458-454+120 KP's of the ROW (which is ant's nest depth) shall be scraped together with rocks and stones 15 days before the construction works and shall be stored near the ROW.</p> <p><b>For Habitat</b></p> <p>* 20 cm of top soil between 451+458-454+120 KP's of the ROW (which is ant's nest depth) shall be scraped together with rocks and stones 15 days before the construction works and shall be stored near the ROW.</p> <p>* Terracing shall be carried out at the (451+966-452+070/453+894-454+000) KP's to prevent erosion.</p>
	518+154-521+487	3,333	M	Gümüşhane	-	-	E1.2E	H	<i>Tanacetum densum ssp. sivasicum</i> (Flora) <i>Polyommatus actis</i> <b>Actis Blue</b> (Arthropoda – Butterfly)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	<p>* Closed construction period: 1 May – 1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Tanacetum densum ssp. sivasicum</i>)</b></p> <p>* The seeds of <i>Tanacetum densum ssp. sivasicum</i>, <i>Onobrychis</i> and <i>Astragalus</i> species shall be collected between 1 July-1 August.</p> <p>* 20 cm of top soil between 518+154-521+487 KP's of the ROW (which is ant's nest depth) shall be scraped together with rocks and stones 15 days before the construction works and shall be stored near the ROW.</p> <p><b>For Arthropoda Species (<i>Polyommatus actis</i>)</b></p> <p>* 20 cm of top soil between 518+154-521+487 KP's of the ROW (which is ant's nest depth) shall be scraped together with rocks and stones 15 days before the construction works and shall be stored near the ROW.</p> <p><b>For Habitat</b></p> <p>* 20 cm of top soil between 518+154-521+487 KP's of the ROW (which is ant's nest depth) shall be scraped together with rocks and stones 15 days before the construction works and shall be stored near the ROW.</p> <p>* The seeds of non-endemic native plants shall be collected and planted on the ROW for erosion control in dip slopes after construction.</p>
CH24	537+806-543+711	5,905	M	Erzincan-Gümüşhane	-	-	E1.2E	H	<i>Tanacetum albipannosum</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	<p>* Closed construction period: 1 May – 1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Tanacetum albipannosum</i>)</b></p> <p>* The top soil between 537+806-543+711 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Tanacetum albipannosum</i> species shall be collected between 1 July-1 August.</p> <p><b>For Habitat</b></p> <p>* The top soil between 537+806-543+711 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH25	564+425-565+125	0,7	M	Erzincan	-	-	X18	L	<i>Isatis undulata</i> (Flora)	M	Criterion 1 Criterion 2	Tier 2 (d) Tier 2 (b)	Criterion 1 & 2	L	* Closed construction period: 1 May – 1 June because of the vegetation period of flora species <b>For Flora Species (<i>Isatis undulata</i>)</b> * The top soil between 564+425-565+125 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Isatis undulata</i> species shall be collected between 1 July-1 August <b>For Habitat</b> * The top soil between 564+425-565+125 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW
CH26	588+880-590+358	1,478	M	Erzincan	REFAHIYE FOREST (KBA)	Criterion 4	G3.F E1.2B	L H	<i>Cochlearia sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2 & 4	L	* Closed construction period: 1 June – 1 July because of the vegetation period of flora species <b>For Flora Species (<i>Cochlearia sintenisii</i>)</b> * The top soil between 588+880- 590+358 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Cochlearia sintenisii</i> species shall be collected between 1 July-1 August. <b>For Habitat</b> * The top soil between 588+880- 590+358 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW
CH27	604+940-608+000	03.Haz	M	Erzincan-Sivas	REFAHIYE FOREST (KBA)	Criterion 4	E1.2B G3.4 F2.2 E2.5	H H M H	<i>Cochlearia sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2 & 4	L	* Closed construction period: 1 June – 1 July because of the vegetation period of flora species <b>For Flora Species (<i>Cochlearia sintenisii</i>)</b> * The top soil between 604+940-608+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Cochlearia sintenisii</i> species shall be collected between 1 July-1 August <b>For Habitat</b> * The top soil between 604+940-608+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW
CH28	614+648-626+000	11,352	H (E1.2B), M (G3.4, F2.2, G1.7)	Sivas	REFAHIYE FOREST (KBA)	Criterion 4	E1.2B G3.4 F2.2 G1.7	H H M M	<i>Bellevalia crassa</i> (Flora) <i>Asperula capitellata</i> (Flora) <i>Cochlearia sintenisii</i> (Flora) <i>Thymus cappadocicus</i> var. <i>pruinus</i> (Flora)	H M M M	Criterion 1 Criterion 2 Criterion 2 Criterion 2	Tier 2 (d) Tier 2 (b) Tier 2 (b) Tier 2 (b)	Criterion 1, 2 & 4	L	* Closed construction period: 1 June – 1 July because of the vegetation period of flora species <b>For Flora Species (<i>Bellevalia crassa</i>, <i>Asperula capitellata</i>, <i>Cochlearia sintenisii</i>, <i>Thymus cappadocicus</i> var. <i>pruinus</i>, <i>Achillea sintenisii</i>)</b> * The top soil between 614+648-626+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The bulbs of <i>Bellevalia crassa</i> species shall be collected near the ROW and carried to out of the ROW.

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Achillea sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)			* The seeds of the <i>Asperula capitellata</i> , <i>Cochleria sintenisii</i> , and <i>Thymus cappadocicus</i> var. <i>pruinus</i> species shall be collected near the ROW between 1 July-1 August; the seeds of the <i>Achillea sintenisii</i> species shall be collected near the ROW between 15 July-15 August. <b>For Habitat</b> * The top soil between 614+648-626+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH29	632+635-634+183	1,548	M	Sivas	-	-	E1.2E	H	<i>Isatis undulata</i> (Flora) <i>Cochlearia sintenisii</i> (Flora)	M M	Criterion 1 Criterion 2 Criterion 2	Tier 2 (d) Tier 2 (b) Tier 2 (b)	Criterion 1 & 2	L	* Closed construction period: 1 June – 1 July because of the vegetation period of flora species <b>For Flora Species (<i>Isatis undulata</i>, <i>Cochlearia sintenisii</i>)</b> 632+635 - 634+183 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Seeds of <i>Isatis undulata</i> and <i>Cochleria sintenisii</i> species shall be collected near the ROW, from the (37 S 431034.20-4418698.72) coordinates between 1 July-1 August. <b>For Habitat</b> 632+635 - 634+183 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Terracing shall be carried out at the (633+257-633+562) KP's to prevent erosion on the dip slopes after construction works.
CH30	634+285-634+864	0,579	M	Sivas	-	-	E1.2E	H	<i>Isatis undulata</i> (Flora) <i>Cochlearia sintenisii</i> (Flora)	M M	Criterion 1 Criterion 2 Criterion 2	Tier 2 (d) Tier 2 (b) Tier 2 (b)	Criterion 1 & 2	L	* Closed construction period: 1 June – 1 July because of the vegetation period of flora species <b>For Flora Species (<i>Isatis undulata</i>, <i>Cochlearia sintenisii</i>)</b> 634+285- 634+864KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Isatis undulata</i> and <i>Cochleria sintenisii</i> species shall be collected between 1 July-1 August. <b>For Habitat</b> 634+285- 634+864KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Terracing shall be carried out at the (634+736-634+858) KP's to prevent erosion on the dip slopes after construction.
CH31	634+906-634+932	0,026	H	Sivas	-	-	G1.3 E1.2E	M H	<i>Hexatoma n. sp.</i> (Arthropoda) <i>Tipula n.sp</i> (Arthropoda)	H H	Criterion 2 Criterion 2	Tier 1 (a) Tier 1 (a)	Criterion 2	L	<b>For Arthropoda Species (<i>Hexatoma n. sp.</i>, <i>Tipula n.sp</i>) and for Habitat</b> * The top soil between 634+906- 634+932 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH32	652+000-654+878	2,878	H	Sivas	-	-	E1.00	H	<i>Gypsophila heteropoda ssp. minutiflora</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)	Criterion 1 & 2	L	* Closed construction period: 1 May – 1 June because of the vegetation period of flora species  <b>For Flora Species (<i>Gypsophila heteropoda ssp. minutiflora</i>, <i>Astragalus zaraensis</i>, <i>Chrysocamela noeana</i>, <i>Minuartia corymbulosa var. gypsophiloides</i>, <i>Achillea sintenisii</i>, <i>Centaurea sivasica</i>, <i>Gypsophila aucheri</i>, <i>Isatis glauca ssp. sivasica</i>, <i>Scorzonera aucherana</i>, <i>Scrophularia lepidota</i>, <i>Thesium stelleroides</i>)</b> * The top soil between 652+000-654+878 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Gypsophila heteropoda ssp. minutiflora</i> and <i>Chrysocamela noeana</i> species shall be collected between 1 June-20 July; the seeds of <i>Astragalus zaraensis</i> and <i>Minuartia corymbulosa var. gypsophiloides</i> , <i>Achillea sintenisii</i> , <i>Centaurea sivasica</i> , <i>Gypsophila aucheri</i> , <i>Isatis glauca ssp. sivasica</i> , <i>Scorzonera aucherana</i> , <i>Scrophularia lepidota</i> , <i>Thesium stelleroides</i> species shall be collected between 15 June-15 July. * Some of the collected seeds of <i>Chrysocamela noeana</i> , <i>Isatis glauca ssp. sivasica</i> species must be given to the seed gene bank. <b>For Arthropoda Species (<i>Tipula n.sp</i>)</b> * The top soil between 652+000-654+878 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site. <b>For Habitat</b> * The top soil between 652+000-654+878 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site.
									<i>Astragalus zaraensis</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)			
									<i>Chrysocamela noeana</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)			
									<i>Minuartia corymbulosa var. gypsophiloides</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)			
									<i>Achillea sintenisii</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Centaurea sivasica</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Gypsophila aucheri</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Isatis glauca ssp. sivasica</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Scorzonera aucherana</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Scrophularia lepidota</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Thesium stelleroides</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
									<i>Tipula n.sp</i> <b>(Arthropoda)</b>	H	Criterion 2	Tier 1 (a)			
CH33	656+000-656+431	0,431	H	Sivas	-	-	E1.00	H	<i>Gypsophila heteropoda ssp. minutiflora</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)	Criterion 1 & 2	L	* Closed construction period: 1 May – 1 June because of the vegetation period of flora species  <b>For Flora Species (<i>Gypsophila heteropoda ssp. minutiflora</i>, <i>Astragalus zaraensis</i>, <i>Chrysocamela noeana</i>, <i>Minuartia corymbulosa var. gypsophiloides</i>, <i>Achillea sintenisii</i>, <i>Centaurea sivasica</i>, <i>Gypsophila aucheri</i>, <i>Isatis</i></b>
									<i>Astragalus zaraensis</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)			
											Criterion 2	Tier 2 (b)			

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH34									<i>Chrysocamela noeana</i> (Flora)	H	Criterion 1	Tier 2 (d)			<b><i>glauca ssp. sivasica, Scorzonera aucherana, Scrophularia lepidota, Thesium stelleroides</i></b> * The top soil between 656+000-656+431 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Gypsophila heteropoda ssp. minutiflora</i> and <i>Chrysocamela noeana</i> species shall be collected between 1 June-20 July; the seeds of <i>Astragalus zaraensis</i> and <i>Minuartia corymbulosa var. gypsophiloides, Achillea sintenisii, Centaurea sivasica, Gypsophila aucheri, Isatis glauca ssp. sivasica, Scorzonera aucherana, Scrophularia lepidota, Thesium stelleroides</i> species shall be collected between 15 June-15 July. * Some of the collected seeds of <i>Chrysocamela noeana, Isatis glauca ssp. sivasica</i> species must be given to the seed gene bank. <b>For Arthropoda Species (<i>Tipula n.sp</i>)</b> * The top soil between 656+000-656+431 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site. <b>For Habitat</b> * The top soil between 656+000-656+431 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site.
									<i>Minuartia corymbulosa var. gypsophiloides</i> (Flora)	H	Criterion 1	Tier 2 (d)			
									<i>Achillea sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Centaurea sivasica</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Gypsophila aucheri</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Isatis glauca ssp. sivasica</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Scorzonera aucherana</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Scrophularia lepidota</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Thesium stelleroides</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Tipula n.sp</i> (Arthropoda)	H	Criterion 2	Tier 1 (a)			
CH34	660+353-660+456	0,103	H	Sivas	-	-	E1.00	H	<i>Gypsophila heteropoda ssp. minutiflora</i> (Flora)	H	Criterion 1	Tier 2 (d)	Criterion 1 & 2	L	* Closed construction period: 1 May – 1 June because of the vegetation period of flora species <b>For Flora Species (<i>Gypsophila heteropoda ssp. minutiflora, Astragalus zaraensis, Chrysocamela noeana, Minuartia corymbulosa var. gypsophiloides, Achillea sintenisii, Centaurea sivasica, Gypsophila aucheri, Isatis</i></b>
									<i>Astragalus zaraensis</i> (Flora)	H	Criterion 1	Tier 2 (d)			
											Criterion 2	Tier 2 (b)			

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Chrysocamela noeana</i> (Flora)  <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> (Flora)  <i>Achillea sintenisii</i> (Flora)  <i>Centaurea sivasica</i> (Flora)  <i>Gypsophila aucheri</i> (Flora)  <i>Isatis glauca</i> ssp. <i>sivasica</i> (Flora)  <i>Scorzonera aucherana</i> (Flora)  <i>Scrophularia lepidota</i> (Flora)  <i>Thesium stelleroides</i> (Flora)  <i>Tipula n.sp</i> (Arthropoda)	H	Criterion 1	Tier 2 (d)			<b><i>glauca</i> ssp. <i>sivasica</i>, <i>Scorzonera aucherana</i>, <i>Scrophularia lepidota</i>, <i>Thesium stelleroides</i></b> * The top soil between 660+353 - 660+456 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i> and <i>Chrysocamela noeana</i> species shall be collected between 1 June-20 July; the seeds of <i>Astragalus zaraensis</i> and <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> , <i>Achillea sintenisii</i> , <i>Centaurea sivasica</i> , <i>Gypsophila aucheri</i> , <i>Isatis glauca</i> ssp. <i>sivasica</i> , <i>Scorzonera aucherana</i> , <i>Scrophularia lepidota</i> , <i>Thesium stelleroides</i> species shall be collected between 15 June-15 July. * Some of the collected seeds of <i>Chrysocamela noeana</i> , <i>Isatis glauca</i> ssp. <i>sivasica</i> species must be given to the seed gene bank. <b>For Arthropoda Species (<i>Tipula n.sp</i>)</b> * The top soil between 660+353 - 660+456 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site. <b>For Habitat</b> * The top soil between 660+353 - 660+456 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site.
CH35	661+206-661+709	0,503	H	Sivas	-	-	E1.00	H	<i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i> (Flora)  <i>Astragalus zaraensis</i> (Flora)	H	Criterion 1 Criterion 2	Tier 2 (d) Tier 2 (b)	Criterion 1 & 2	L	* Closed construction period: 1 May – 1 June because of the vegetation period of flora species <b>For Flora Species (<i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i>, <i>Astragalus zaraensis</i>, <i>Chrysocamela noeana</i>, <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i>, <i>Achillea sintenisii</i>, <i>Centaurea sivasica</i>, <i>Gypsophila aucheri</i>, <i>Isatis</i></b>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Chrysocamela noeana</i> (Flora)  <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> (Flora)  <i>Achillea sintensisii</i> (Flora)  <i>Centaurea sivasica</i> (Flora)  <i>Gypsophila aucheri</i> (Flora)  <i>Isatis glauca</i> ssp. <i>sivasica</i> (Flora)  <i>Scorzonera aucherana</i> (Flora)  <i>Scrophularia lepidota</i> (Flora)  <i>Thesium stelleroides</i> (Flora)  <i>Tipula n.sp</i> (Arthropoda)	H	Criterion 1	Tier 2 (d)			<p><b><i>glauca</i> ssp. <i>sivasica</i>, <i>Scorzonera aucherana</i>, <i>Scrophularia lepidota</i>, <i>Thesium stelleroides</i></b></p> <p>* The top soil between 661+206 - 661+709 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i> and <i>Chrysocamela noeana</i> species shall be collected near the ROW between 1 June-20 July; the seeds of <i>Astragalus zaraensis</i> and <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i>, <i>Achillea sintensisii</i>, <i>Centaurea sivasica</i>, <i>Gypsophila aucheri</i>, <i>Isatis glauca</i> ssp. <i>sivasica</i>, <i>Scorzonera aucherana</i>, <i>Scrophularia lepidota</i>, <i>Thesium stelleroides</i> species shall be collected near the ROW between 15 June-15 July.</p> <p>* The <i>Astragalus zaraensis</i>, <i>Achillea sintensisii</i>, <i>Scorzonera aucherana</i>, <i>Thymus pectinatus</i>, <i>Gypsophila eriocalyx</i> species individuals shall be removed as tufts from the (661+236-661+267 / 661+353-661+387 / 661+432-661+461 / 661+531-661+576) KP's and shall be transferred to the (37 S 407182.00-4414267.00) coordinates.</p> <p>* Some of the collected seeds of <i>Chrysocamela noeana</i>, <i>Isatis glauca</i> ssp. <i>sivasica</i> species must be given to the seed gene bank.</p> <p><b>For Arthropoda Species (<i>Tipula n.sp</i>)</b></p> <p>* The top soil between 661+206 - 661+709 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* Gypsum rocks excavated during activity shall be stored nearby the construction site.</p> <p><b>For Habitat</b></p> <p>* The top soil between 661+206 - 661+709 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* Gypsum rocks excavated during activity shall be stored nearby the construction site.</p> <p><i>Thymus pectinatus</i>, <i>Gypsophila eriocalyx</i> species individuals shall be removed as tufts from the (661+236-661+267 / 661+353-661+387 / 661+432-661+461 / 661+531-661+576) KP's and shall be transferred to the (37 S 407182.00-4414267.00) coordinates.</p> <p>* Terracing shall be carried out between the (661+448-661+704) KP's.</p>
CH36	683+613-683+648	0,035	H	Sivas	HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<i>Dysmachus safranboluticus</i> (Arthropoda)  <i>Astragalus zaraensis</i> (Flora)  <i>Achillea sintensisii</i> (Flora)	H	Criterion 2	Tier 2 (b)	Criterion 1, 2 & 4	L	<p>* Closed construction period: 1 May – 1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Astragalus zaraensis</i>, <i>Achillea sintensisii</i>, <i>Astragalus aytatchii</i>, <i>Centaurea sivasica</i>, <i>Chrysocamela noeana</i>, <i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i>, <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i>)</b></p> <p>* The top soil between 683+613-683+648 KP's shall be</p>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Astragalus aytatchii</i> <b>(Flora)</b> <i>Centaurea sivasica</i> <b>(Flora)</b> <i>Chrysocamela noeana</i> <b>(Flora)</b> <i>Gypsophila heteropoda ssp. minutiflora</i> <b>(Flora)</b> <i>Minuartia corymbulosa var. gypsophiloides</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)		scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Astragalus zaraensis</i> , <i>Achillea sintenisii</i> , <i>Astragalus aytatchii</i> , <i>Centaurea sivasica</i> , <i>Minuartia corymbulosa var. gypsophiloides</i> and <i>Thymus pectinatus</i> species shall be collected near the ROW between 15 June-15 July; the seeds of <i>Chrysocamela noeana</i> , <i>Gypsophila heteropoda ssp. minutiflora</i> species shall be collected near the ROW between 1 June-20 June. * The <i>Astragalus zaraensis</i> species individuals shall be removed as tufts from the (37 S 386761.62 4408728.69) coordinates and shall be transferred to the (37 S 386759.46-4408680.42) coordinates. * The individuals of the <i>Achillea sintenisii</i> species shall be transferred to the (37 S 386759.46-4408680.42) coordinates. * Some of the collected seeds of <i>Chrysocamela noeana</i> species must be given to the seed gene bank. <b>For Arthropoda Species (<i>Dysmachus safranboluticus</i>)</b> * The top soil between 683+613-683+648 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Herbaceous plants shall be harvested and 10-15 cm of top soil of the ROW shall be scraped and stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site <b>For Habitat</b> * The top soil between 683+613-683+648 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the construction site	
									M	Criterion 2	Tier 2 (b)				
									H	Criterion 1	Tier 2 (d)				
									H	Criterion 2	Tier 2 (b)				
									H	Criterion 1	Tier 2 (d)				
									H	Criterion 2	Tier 2 (b)				
CH37	683+924-683+963	0,039	H	Sivas	HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<i>Dysmachus safranboluticus</i> <b>(Arthropoda)</b> <i>Astragalus zaraensis</i> <b>(Flora)</b> <i>Achillea sintenisii</i> <b>(Flora)</b> <i>Astragalus aytatchii</i>	H	Criterion 2	Tier 2 (b)	Criterion 1, 2 & 4	L	* Closed construction period: 1 May – 1 June because of the vegetation period of flora species <b>For Flora Species (<i>Astragalus zaraensis</i>, <i>Achillea sintenisii</i>, <i>Astragalus aytatchii</i>, <i>Centaurea sivasica</i>, <i>Chrysocamela noeana</i>, <i>Gypsophila heteropoda ssp. minutiflora</i>, <i>Minuartia corymbulosa var. gypsophiloides</i>)</b> * The top soil between 683+613-683+648 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<p><b>(Flora)</b>  <i>Centaurea sivasica</i>  <b>(Flora)</b>  <i>Chrysocamela noeana</i>  <b>(Flora)</b>  <i>Gypsophila heteropoda ssp. minutiflora</i>  <b>(Flora)</b>  <i>Minuartia corymbulosa var. gypsophiloides</i>  <b>(Flora)</b></p>	M	Criterion 2	Tier 2 (b)			<p>ROW.                      * The seeds of <i>Astragalus zaraensis</i>, <i>Achillea sintenisii</i>, <i>Astragalus aytatchii</i>, <i>Centaurea sivasica</i>, <i>Minuartia corymbulosa var. gypsophiloides</i> and <i>Thymus pectinatus</i> species shall be collected near the ROW between 15 June-15 July; the seeds of <i>Chrysocamela noeana</i>, <i>Gypsophila heteropoda ssp. minutiflora</i> species shall be collected near the ROW between 1 June-20 June.                      * The <i>Astragalus zaraensis</i>, <i>Achillea sintenisii</i>, <i>Thymus pectinatus</i> species individuals shall be removed as tufts between the (683+934-683+954) KP's and shall be transferred to the (37 S 386463.44-4408686.64)                      * Some of the collected seeds of <i>Chrysocamela noeana</i> species must be given to the seed gene bank.  <b>For Arthropoda Species (<i>Dysmachus safranboliticus</i>)</b>                      * The top soil between 683+613-683+648 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.                      * Herbaceous plants shall be harvested and 10-15 cm of top soil of the ROW shall be scraped and stored near the ROW.                      * Gypsum rocks excavated during activity shall be stored nearby the construction site.  <b>For Habitat</b>                      * The top soil between 683+613-683+648 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.                      * Herbaceous plants shall be harvested and 10-15 cm of top soil of the ROW shall be scraped and stored near the ROW.                      * Gypsum rocks excavated during activity shall be stored nearby the construction site.</p>
										H	Criterion 1	Tier 2 (d)			
										H	Criterion 2	Tier 2 (b)			
										H	Criterion 1	Tier 2 (d)			
										H	Criterion 2	Tier 2 (b)			
										H	Criterion 1	Tier 2 (d)			
										H	Criterion 2	Tier 2 (b)			
										H	Criterion 1	Tier 2 (b)			
CH38	700+549-701+087	0,538	H	Sivas	MAĞARA LAKE BUFFER ZONE (WETLAND) + HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<p><i>Astragalus aytatchii</i>  <b>(Flora)</b>  <i>Gypsophila heteropoda ssp. minutiflora</i>  <b>(Flora)</b>  <i>Astragalus zaraensis</i></p>	H	Criterion 1	Tier 2 (d)	Criterion 1, 2 & 4	L	<p>* Closed construction period: 1 May – 1 June because of the vegetation period of flora species  <b>For Flora Species (<i>Astragalus aytatchii</i>, <i>Gypsophila heteropoda ssp. minutiflora</i>, <i>Astragalus zaraensis</i>, <i>Chrysocamela noeana</i>, <i>Minuartia corymbulosa var. gypsophiloides</i>, <i>Onobrychis stenostachya ssp. krausei</i>, <i>Achillea sintenisii</i>, <i>Achillea sipikorensis</i>, <i>Centaurea</i></b></p>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<b>(Flora)</b> <i>Chrysocamela noeana</i> <b>(Flora)</b> <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> <b>(Flora)</b> <i>Onobrychis stenostachya</i> ssp. <i>krausei</i> <b>(Flora)</b> <i>Achillea sintenisii</i> <b>(Flora)</b> <i>Achillea sipikorensis</i> <b>(Flora)</b> <i>Centaurea sivasica</i> <b>(Flora)</b> <i>Isatis glauca</i> ssp. <i>sivasica</i> <b>(Flora)</b>	H	Criterion 1	Tier 2 (d)			<b>sivasica, Isatis glauca ssp. sivasica)</b> * The top soil shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Astragalus aytatchii</i> , <i>Astragalus zaraensis</i> , <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> , <i>Onobrychis stenostachya</i> ssp. <i>krausei</i> , <i>Achillea sintenisii</i> , <i>Achillea sipikorensis</i> , <i>Centaurea sivasica</i> , <i>Isatis glauca</i> ssp. <i>sivasica</i> species shall be collected near the ROW between 15 June-15 July; the seeds of <i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i> , <i>Chrysocamela noeana</i> species shall be collected near the ROW between 1 June-20 June. * The <i>Astragalus zaraensis</i> , <i>Achillea sintenisii</i> , <i>Achillea sipikorensis</i> and <i>Thymus pectinatus</i> species individuals shall be removed as tufts between the (700+757-701+006) KP's and shall be transferred to the (37 S 370016.63-4408569.92 /37 S 370096.00-4408596.00) coordinates. * Some of the collected seeds of <i>Chrysocamela noeana</i> and <i>Isatis glauca</i> ssp. <i>sivasica</i> species must be given to the seed gene bank. <b>For Habitat</b> * The top soil shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the ROW. * The <i>Astragalus zaraensis</i> , <i>Achillea sintenisii</i> , <i>Achillea sipikorensis</i> and <i>Thymus pectinatus</i> species individuals shall be removed as tufts between the (700+757-701+006) KP's and shall be transferred to the (37 S 370016.63-4408569.92 /37 S 370096.00-4408596.00) coordinates. * The removed individuals of the <i>Astragalus zaraensis</i> , <i>Achillea sintenisii</i> , <i>Achillea sipikorensis</i> and <i>Thymus pectinatus</i> species as tufts shall be planted at the (700+757-701+006) KP's, where the terracing shall be carried out to prevent erosion and shall be irrigated until they root again after construction works.
CH39	708+677-708+890	0,213	H	Sivas	BATAKLIKDÜZÜ 2 BUFFER ZONE (WETLAND) + HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<i>Achillea sintenisii</i> <b>(Flora)</b> <i>Astragalus zaraensis</i> <b>(Flora)</b> <i>Chrysocamela noeana</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)	Criterion 1, 2 & 4	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Achillea sintenisii</i>, <i>Astragalus zaraensis</i>, <i>Chrysocamela noeana</i>, <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i>)</b> * The top soil between 708+677-708+890 KP's should be scraped at a depth of 10-15 cm and should be stored near the ROW.

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH40	713+855-713+956	0,101	H	Sivas	ÇETME LAKE BUFFER ZONE (WETLAND) + HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> (Flora)	H	Criterion 1	Tier 2 (d)	Criterion 1, 2 & 4	L	<p>* The seeds of <i>Achillea sintenisii</i>, <i>Astragalus zaraensis</i>, <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> species shall be collected near the ROW between 15 June-15 July; the seeds of <i>Chrysocamela noeana</i> species shall be collected near the ROW between 1 June-20 June</p> <p>* Some of the collected seeds of <i>Chrysocamela noeana</i> species must be given to the seed gene bank.</p> <p><b>For Habitat</b></p> <p>* The top soil between 708+677-708+890 KP's should be scraped at a depth of 10-15 cm and should be stored near the ROW.</p> <p>* Gypsum rocks excavated during activity shall be stored nearby the ROW.</p>
									<i>Achillea sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Gypsophila aucheri</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i> (Flora)	H	Criterion 1	Tier 2 (d)			
									<i>Onosma sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)			
<i>Centaurea sivasica</i> (Flora)	M	Criterion 2	Tier 2 (b)												
CH41	720+035-720+290	0,255	H	Sivas	TUZLU LAKE BUFFER ZONE (WETLAND) + HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i> (Flora)	H	Criterion 1	Tier 2 (d)	Criterion 1, 2 & 4	L	<p>* Closed construction period: 1 May-1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i>, <i>Astragalus zaraensis</i>, <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i>, <i>Achillea sintenisii</i>, <i>Gypsophila aucheri</i>, <i>Onosma sintenisii</i>)</b></p> <p>* The top soil between 720+035-720+290 shall be scraped at</p>
									<i>Astragalus zaraensis</i> (Flora)	H	Criterion 1	Tier 2 (d)			
									<i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> (Flora)	H	Criterion 1	Tier 2 (d)			

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH42									<i>Gypsophiloides</i> (Flora)		Criterion 2	Tier 2 (b)			a depth of 10-15 cm and shall be stored near the ROW. *The seeds of <i>Gypsophila heteropoda</i> ssp. <i>minutiflora</i> species shall be collected near the ROW between 1 June-20 June; the seeds of <i>Astragalus zaraensis</i> , <i>Minuartia corymbulosa</i> var. <i>gypsophiloides</i> , <i>Achillea sintenisii</i> , <i>Gypsophila aucheri</i> , <i>Onosma sintenisii</i> species shall be collected near the ROW between 15 June-15 July. * Some of the collected seeds of <i>Onosma sintenisii</i> species must be given to the seed gene bank. <b>For Habitat</b> * The top soil between 720+035-720+290 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Gypsum rocks excavated during activity shall be stored nearby the ROW. * Terracing shall be carried out at the (720+035-720+083) KP's to prevent erosion after construction.
									<i>Achillea sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Gypsophila aucheri</i> (Flora)	M	Criterion 2	Tier 2 (b)			
									<i>Onosma sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)			
CH42	729+485-729+571	0,086	H	Sivas	BALIKLIKAYA BUFFER ZONE (WETLAND) + HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<i>Astragalus zaraensis</i> (Flora)	H	Criterion 1	Tier 2 (d)	Criterion 1, 2 & 4	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Astragalus zaraensis</i>, <i>Achillea sintenisii</i>)</b> * The top soil between 729+485-729+571 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Astragalus zaraensis</i> and <i>Achillea sintenisii</i> species shall be collected near the ROW between 15 June-15 July. * The species individuals shall be removed as tufts between the (729+485-729+571) KP's and shall be transferred to the (37 S 343055.79-4409365.90) coordinates. <b>For Habitat</b> * The top soil between 729+485-729+571 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW." * Gypsum rocks excavated during activity shall be stored nearby the ROW.
<i>Achillea sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)												
CH43	733+201-733+366	0,165	H	Sivas	HAFİK ZARA HILLS (IBA, KBA, IPA)	Criterion 4	E1.00	H	<i>Onosma sintenisii</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2 & 4	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Onosma sintenisii</i>, <i>Isatis glauca</i> ssp. <i>sivasica</i>, <i>Achillea sintenisii</i>)</b>
<i>Isatis glauca</i> ssp. <i>sivasica</i> (Flora)	M	Criterion 2	Tier 2 (b)												

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Achillea sintenisii</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			<ul style="list-style-type: none"> <li>* The top soil between 733+201- 733+366 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</li> <li>* The seeds of <i>Onosma sintenisii</i>, <i>Isatis glauca ssp. sivasica</i> and <i>Achillea sintenisii</i> species shall be collected near the ROW between 15 June-15 July.</li> <li>* The <i>Onosma sintenisii</i> and <i>Achillea sintenisii</i> species individuals shall be collected between the (733+205-733+234 / 733+262-733+292 / 733+327-733+350) KP's and shall be transferred to the (37 S 339751.11-4407877.07) coordinates.</li> <li>* Some of the collected seeds of <i>Onosma sintenisii</i> and <i>Isatis glauca ssp. sivasica</i> species must be given to the seed gene bank.</li> <li>* The removed individuals of the <i>Astragalus zaraensis</i>, <i>Gypsophila eriocalyx</i>, <i>Thymus pectinatus</i> species as tufts shall be planted at the (741+305-741+339) KP's, where the terracing shall be carried out to prevent erosion and shall be irrigated until they root again after construction works</li> </ul> <p><b>For Habitat</b></p> <ul style="list-style-type: none"> <li>* The top soil between 733+201- 733+366 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</li> <li>* Gypsum rocks excavated during activity shall be stored nearby the ROW.</li> <li>* The removed individuals of the <i>Astragalus zaraensis</i>, <i>Gypsophila eriocalyx</i>, <i>Thymus pectinatus</i> species as tufts shall be planted at the (741+305-741+339) KP's, where the terracing shall be carried out to prevent erosion and shall be irrigated until they root again after construction works</li> </ul>
CH44	741+301-741+446	0,145	H	Sivas	-	-	E1.00	H	<i>Achillea sintenisii</i> <b>(Flora)</b> <i>Chrysocamela noeana</i>	M	Criterion 2	Tier 2 (b)	Criterion 1 & 2	L	<ul style="list-style-type: none"> <li>* Closed construction period: 1 May-15 July because of the vegetation period of flora species</li> </ul> <p><b>For Flora Species (<i>Chrysocamela noeana</i>, <i>Astragalus</i></b></p>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									(Flora) <i>Astragalus zaraensis</i> (Flora) <i>Cousinia sivasica</i> (Flora)	H  M	Criterion 2 Criterion 1 Criterion 2 Criterion 2	Tier 2 (b) Tier 2 (d) Tier 2 (b) Tier 2 (b)			<b><i>zaraensis, Achillea sintenisii, Cousinia sivasica</i></b> * The top soil between 741+301-741+446 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Achillea sintenisii, Cousinia sivasica</i> and <i>Astragalus zaraensis</i> species shall be collected near the ROW (for erosion control) between 15 June-15 July, the seeds of <i>Chrysocamela noeana</i> species shall be collected near the ROW between 1 June-20 June. * The <i>Astragalus zaraensis, Gypsophila eriocalyx, Thymus pectinatus</i> species individuals shall be removed as tufts between the (741+305-741+339) KP's and shall be transferred to the (37 S 332575.24-4408252.16) coordinates. * Some of the collected seeds of <i>Cousinia sivasica</i> and <i>Chrysocamela noeana</i> species must be given to the seed gene bank. <b>For Habitat</b> * The top soil between 741+301-741+446 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Achillea sintenisii, Cousinia sivasica</i> and <i>Astragalus zaraensis</i> species shall be collected near the ROW (for erosion control) between 15 June-15 July, the seeds of <i>Chrysocamela noeana</i> species shall be collected near the ROW between 1 June-20 June. * The <i>Astragalus zaraensis, Gypsophila eriocalyx, Thymus pectinatus</i> species individuals shall be removed as tufts between the (741+305-741+339) KP's and shall be transferred to the (37 S 332575.24-4408252.16) coordinates. * Gypsum rocks excavated during activity shall be stored nearby the ROW.
CH45	746+599-749+672	3,073	M	Sivas	-	-	E1.2E	H	<i>Dysmachus safranboluticus</i> (Arthropoda)	H	Criterion 2	Tier 2 (b)	Criterion 2		<b>For Arthropoda Species (<i>Dysmachus safranboluticus</i>)</b> * The top soil between 746+599-749+672 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Herbaceous plants shall be harvested and stored near the ROW. <b>For Habitat</b> * The top soil between 746+599-749+672 shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH46	802+361-802+428	0,067	H	Sivas	-	-	E2.5 E1.2E	H H	<i>Hexatoma n. sp.</i> (Arthropoda) <i>Cousinia halysensis</i> (Flora)	H M	Criterion 2 Criterion 2	Tier 1 (a) Tier 2 (b)	Criterion 2	L	* Closed construction period: 1 May-15 July because of the vegetation period of flora species <b>For Flora Species (<i>Cousinia halysensis</i>)</b> * The top soil between 802+361-802+428 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Cousinia halysensis</i> species shall be collected near the ROW between 15 June-15 July. <b>For Arthropoda Species (<i>Hexatoma n. sp.</i>)</b> * The top soil between 802+361-802+428 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * <i>Juncus</i> species individuals between the (802+409-802+422) KP's shall be removed and transferred at the (37 S 276993.99-4415718.69) coordinates. <b>For Habitat</b> * The top soil between 802+361-802+428 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH47	802+454-802+755	0,301	H	Sivas	-	-	E1.2E	H	<i>Hexatoma n. sp.</i> <b>(Arthropoda)</b>	H	Criterion 2	Tier 1 (a)	Criterion 2	L	* Closed construction period: 1 May-15 July because of the vegetation period of flora species <b>For Flora Species (<i>Cousinia halysensis</i>)</b> * The top soil between 802+454-802+755 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Cousinia halysensis</i> species shall be collected between 15 June-15 July. <b>For Arthropoda Species (<i>Hexatoma n. sp.</i>) and for habitat</b> * The top soil between 802+454-802+755 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
								M	<i>Cousinia halysensis</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)			
CH48	815+368-815+380	0,012	H	Sivas	-	-	E1.2E	H	<i>Hilara n. sp. 3</i> <b>(Arthropoda)</b>	H	Criterion 2	Tier 1 (a)	Criterion 2	L	<b>For Arthropoda Species (<i>Hilara n. sp. 3</i>) and for habitat</b> * The top soil between 815+368-815+380KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The riparian vegetation at the creek bank between the (815+368-815+380) KP's shall be scraped at a depth of 10-15 cm as a layer and stored at the creek side.
							E3.4	M		M	Criterion 2	Tier 2 (b)			
CH49	846+021-846+224	0,203	H	Yozgat	-	-	G1.7	M	<i>Dioctria n. sp. 2</i> <b>(Arthropoda)</b> <i>Dysmachus safranboluticus</i> <b>(Arthropoda)</b>	H	Criterion 2	Tier 1 (a)	Criterion 2		<b>For Arthropoda Species (<i>Dioctria n. sp. 2</i>, <i>Dysmachus safranboluticus</i>)</b> * The top soil between 846+021-846+224 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * Herbaceous plants shall be harvested at the (846+021-846+224) KP's and stored near the ROW. <b>For Habitat</b> * The top soil between 846+021-846+224 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
								M		H	Criterion 2	Tier 2 (b)			
CH50	945+058-945+445	0,387	M	Yozgat	-	-	E1.2E	H	<i>Cousinia halysensis</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)	Criterion 2	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Cousinia halysensis</i>)</b> * The top soil between 945+058-945+445 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. *The seeds of <i>Cousinia halysensis</i> species shall be collected near the ROW between 15 June-15 July. <b>For Habitat</b> * The top soil between 945+058-945+445 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH51	993+073-993+795	0,722	M	Yozgat	-	-	E1.2E	H	<i>Cousinia halysensis</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)	Criterion 2	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Cousinia halysensis</i>)</b> * The top soil between 993+073-993+795 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Cousinia halysensis</i> species shall be collected between 15 June-15 July <b>For Habitat</b> * The top soil between 993+073-993+795 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH52	1029+605-1029+804	0,199	M	Yozgat	-	-	E1.00	H	<i>Thymus leucostomus</i> <b>(Flora)</b>	M	Criterion 2	Tier 2 (b)	Criterion 2	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
CH53									<i>Cousinia halysensis</i> (Flora)	M	Criterion 2	Tier 2 (b)			<p><b>For Flora Species (<i>Cousinia halysensis</i>, <i>Thymus leucostomus</i>)</b></p> <p>* The top soil between 1029+605-1029+804 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Thymus leucostomus</i> and <i>Cousinia halysensis</i> species shall be collected between 15 June-15 July.</p> <p><b>For Habitat</b></p> <p>* The top soil between 993+073-993+795 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>
	1030+091-1030+310	0,219	M	Yozgat	-	-	E1.00	H	<i>Thymus leucostomus</i> (Flora) <i>Cousinia halysensis</i> (Flora)	M M	Criterion 2 Criterion 2	Tier 2 (b) Tier 2 (b)	Criterion 2	L	<p>* Closed construction period: 1 May-1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Cousinia halysensis</i>, <i>Thymus leucostomus</i>)</b></p> <p>* The top soil between 1030+091-1030+310 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Thymus leucostomus</i> and <i>Cousinia halysensis</i> species shall be collected between 15 June-15 July.</p> <p><b>For Habitat</b></p> <p>* The top soil between 1030+091-1030+310 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>
CH54	1139+490-1140+300	0,81	M	Ankara	-	-	E1.2E	H	<i>Cousinia halysensis</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	<p>* Closed construction period: 1 May-1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Cousinia halysensis</i>)</b></p> <p>* The top soil between 1139+490 -1140+300 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Cousinia halysensis</i> species shall be collected between 15 June-15 July.</p> <p><b>For Habitat</b></p> <p>* The top soil between 1139+490 -1140+300 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>
CH55	1149+730-1149+900	0,17	M	Ankara	-	-	E1.01	H	<i>Thymus leucostomus</i> (Flora) <i>Cousinia halysensis</i> (Flora)	M M	Criterion 2 Criterion 2	Tier 2 (b) Tier 2 (b)	Criterion 2	L	<p>* Closed construction period: 1 May-1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Cousinia halysensis</i>, <i>Thymus leucostomus</i>)</b></p> <p>* The top soil between 1149+730-1149+900 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Thymus leucostomus</i> and <i>Cousinia halysensis</i> species shall be collected between 15 June-15 July.</p> <p><b>For Habitat</b></p> <p>* The top soil between 1149+730-1149+900 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES	
CH56	1208+945-1209+108	0,163	M	Ankara	-	-	E1.01	H	<i>Thymus leucostomus</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	<p>* Closed construction period: 1 May-1 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Thymus leucostomus</i>)</b></p> <p>* The top soil between 1208+945 - 1209+108 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Thymus leucostomus</i> species shall be collected between 15 June-15 July.</p> <p><b>For Habitat</b></p> <p>* The top soil between 1208+945 - 1209+108 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>	
CH57	1223+54-1223+506	0,452	H	Eskişehir	ACIKIR STEPPE (KBA, IPA)	Criterion 4	E1.01	H	<p><i>Neolycaena soezen</i></p> <p><b>Soezen's Pseudocopper (Arthropoda – Butterfly)</b></p> <p><i>Scutellaria yildirimli</i> (Flora)</p> <p><i>Achillea ketenoglui</i> (Flora)</p> <p><i>Astragalus physodes ssp. acikirensis</i> (Flora)</p> <p><i>Minuartia corymbulosa var. gypsophiloides</i> (Flora)</p> <p><i>Astragalus kochakii</i> (Flora)</p> <p><i>Cyathobasis fruticulosa</i> (Flora)</p> <p><i>Onobrychis paucijuga</i> (Flora)</p>	H	Criterion 2	Tier 2 (b)	Criterion 1, 2 & 4	L	<p>* Closed construction period: 1 May-30 June because of the vegetation period of flora species</p> <p><b>For Flora Species (<i>Scutellaria yildirimli</i>, <i>Achillea ketenoglui</i>, <i>Astragalus physodes ssp. acikirensis</i>, <i>Minuartia corymbulosa var. gypsophiloides</i>, <i>Astragalus kochakii</i>, <i>Cyathobasis fruticulosa</i>, <i>Onobrychis paucijuga</i>, <i>Thymus leucostomus</i>)</b></p> <p>* The top soil between 1223+54 -1223+506 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* The seeds of <i>Scutellaria yildirimli</i>, <i>Achillea ketenoglui</i>, <i>Astragalus kochakii</i>, <i>Onobrychis paucijuga</i> species shall be collected near the ROW between 1 June- 1 July; the seeds of <i>Astragalus physodes ssp. acikirensis</i> species shall be collected near the ROW between 15 May-15 June; the seeds of <i>Thymus leucostomus</i> species shall be collected near the ROW between 15 June-15 July; the seeds of <i>Minuartia corymbulosa var. gypsophiloides</i> species shall be collected near the ROW between 15 July-15 August; the seeds of <i>Cyathobasis fruticulosa</i> species shall be collected near the ROW between 1 July-1 August.</p> <p>* Some of the collected seeds of <i>Achillea ketenoglui</i>, <i>Astragalus physodes ssp. acikirensis</i>, <i>Minuartia corymbulosa var. gypsophiloides</i>, <i>Astragalus kochakii</i>, <i>Cyathobasis</i></p>	
									H	Criterion 1	Tier 2 (d)					
									H	Criterion 2	Tier 2 (b)					
									H	Criterion 1	Tier 2 (d)					
									H	Criterion 2	Tier 2 (b)					
									H	Criterion 1	Tier 2 (d)					
									M	Criterion 2	Tier 2 (b)					

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Thymus leucostomus</i> (Flora)	M	Criterion 2	Tier 2 (b)			<i>fruticulosa</i> , <i>Onobrychis paucijuga</i> species must be given to the seed gene bank. <b>For Arthropoda Species (<i>Neolycaena soezen</i>)</b> * The top soil between 1223+54 -1223+506 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of the <i>Caragana grandiflora</i> species which is a food plant of <i>Neolycaena soezen</i> , shall be collected. * <i>Caragana grandiflora</i> individuals shall be collected with their soils and planted near the ROW at the (36 S 405664.19-4363111.56) coordinates. <b>For Habitat</b> * The top soil between 1223+54 -1223+506 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The area shall be surrounded by a wire mesh or fence to protect the area from grazing and other pressures after construction works.
CH58	1362+917-1363+753	0,836	L	Eskişehir	-	-	E1.2E	H	<i>Thymus leucostomus</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Thymus leucostomus</i>)</b> * The top soil between 1362+917- 1363+753 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Thymus leucostomus</i> species shall be collected between 15 June-15 July. <b>For Habitat</b> * The top soil between 1362+917- 1363+753 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH59	1366+493-	0,199	M	Eskişehir	-	-	G1.7	M	<i>Salvia tchihatcheffii</i>	M	Criterion 1	Tier 2 (d)	Criterion 1 &	L	* Closed construction period: 1 May-1 June because of the

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
	1366+692								(Flora)		Criterion 2	Tier 2 (b)	2		vegetation period of flora species <b>For Flora Species (<i>Salvia tchihatceffii</i>)</b> * The top soil between 1366+493 - 1366+692 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * If the construction works start in March 2015; the seeds of <i>Salvia tchihatceffii</i> species shall be collected near the ROW between 1 June-1 July. * The <i>Salvia tchihatceffii</i> species individuals shall be collected as tufts between the (1366+512-1366+537) KP's and shall be transferred to the (36 S 276899.00-4396448.00) coordinates. * The translocated individuals of the <i>Salvia tchihatceffii</i> species as tufts shall be planted at the (1366+512-1366+537) KP's, where the terracing shall be carried out to prevent erosion and shall be irrigated until they root again after construction works. <b>For Habitat</b> * The top soil between 1366+493 - 1366+692 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The <i>Salvia tchihatceffii</i> species individuals shall be collected as tufts between the (1366+512-1366+537) KP's and shall be transferred to the (36 S 276899.00-4396448.00) coordinates. * The translocated individuals of the <i>Salvia tchihatceffii</i> species as tufts shall be planted at the (1366+512-1366+537) KP's, where the terracing shall be carried out to prevent erosion and shall be irrigated until they root again after construction works.
CH60	1372+340-1372+683	0,343	H	Eskişehir	-	-	E1.01 G3.5	H H	<i>Dioctria n. sp. 1 (Arthropoda)</i> <i>Cephalaria aytachii (Flora)</i> <i>Gypsophila osmangaziensis (Flora)</i> <i>Alyssum niveum (Flora)</i> <i>Scabiosa hololeuca (Flora)</i>	H H H H H	Criterion 2 Criterion 1 Criterion 2 Criterion 1 Criterion 2 Criterion 1 Criterion 2 Criterion 1 Criterion 2	Tier 1 (a) Tier 2 (d) Tier 2 (b) Tier 2 (d) Tier 2 (b) Tier 2 (d) Tier 2 (b) Tier 2 (d) Tier 2 (b)	Criterion 1 & 2	L	* Closed construction period: 1 May-15 June because of the vegetation period of flora species <b>For Flora Species (<i>Cephalaria aytachii</i>, <i>Gypsophila osmangaziensis</i>, <i>Alyssum niveum</i>, <i>Scabiosa hololeuca</i>, <i>Salvia tchihatceffii</i>)</b> * The top soil between 1372+340- 1372+683 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * The seeds of <i>Cephalaria aytachii</i> , <i>Gypsophila osmangaziensis</i> , <i>Scabiosa hololeuca</i> species shall be collected between 1 July-August, the seeds of <i>Alyssum niveum</i> and <i>Salvia tchihatceffii</i> species shall be collected between 15 July-15 August. <b>For Habitat</b>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Salvia tchihatcheffii</i> (Flora)	M	Criterion 1 Criterion 2	Tier 2 (d) Tier 2 (b)			* The top soil between 1372+340- 1372+683 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * In the regions between the (1372+552-1372+683) KP's terracing shall be carried out to prevent erosion after construction works.
CH61	1430+920-1432+305	1,385	M	Kütahya	-	-	G1.7  G3.5	M  H	<i>Erodium sibthorpiatum ssp. sibthorpiatum</i> (Flora)  <i>Astragalus densifolius ssp. ayashensis</i> (Flora)	H  M	Criterion 1  Criterion 2	Tier 2 (d)  Tier 2 (b) Tier 2 (b)	Criterion 1 & 2	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Erodium sibthorpiatum ssp. sibthorpiatum</i>, <i>Astragalus densifolius ssp. ayashensis</i>)</b> * The top soil between 1430+920- 1432+305 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. *The seeds of <i>Erodium sibthorpiatum ssp. sibthorpiatum</i> and <i>Astragalus densifolius ssp. ayashensis</i> species shall be collected between 1 June-1 July. <b>For Habitat</b> * The top soil between 1430+920- 1432+305 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH62	1477+452-1477+833	0,381	M	Bursa	-	-	G4.B	M	<i>Onosma briquetii</i> (Flora)	M	Criterion 2	Tier 2 (b)	Criterion 2		* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Onosma briquetii</i>)</b> * The top soil between 1477+452 - 1477+833 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. *The seeds of <i>Onosma briquetii</i> species shall be collected between 1 June-1 July. <b>For Habitat</b> * The top soil between 1477+452 - 1477+833 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH63	1491+767-1496+340	4,573	H (G3.75, G4.B), M (E3.4, G3.F)	Bursa	-	-	G3.F G3.75 E3.4 G4.B	L M M M	<i>Alyssum dudleyi</i> (Flora)  <i>Verbascum n.sp.</i> (Flora)  <i>Dianthus goekayi</i>	H  H H	Criterion 1 Criterion 2 Criterion 1 Criterion 2 Criterion 1	Tier 2 (d) Tier 2 (b) Tier 1 (b) Tier 1 (a) Tier 2 (d)	Criterion 1 & 2	L	* Closed construction period: 1 May-1 June because of the vegetation period of flora species <b>For Flora Species (<i>Alyssum dudleyi</i>, <i>Verbascum n.sp.</i>, <i>Dianthus goekayi</i>)</b> * The top soil between 1491+767 - 1496+340 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									(Flora)		Criterion 2	Tier 2 (b)			* The seeds of <i>Alyssum dudleyi</i> species shall be collected between 1 June-1 July; <i>Dianthus goekayi</i> species shall be collected between 15 June-15 July, <i>Verbascum n.sp.</i> species shall be collected from the (35 S 679080.00-4403701.00/35 S 679921.00-4403502.00/35 S 679810.00-4403499.00/35 S 679185.00-4403189.00) coordinates between 15 June-15 July. <b>For Habitat</b> * The top soil between 1491+767 - 1496+340 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH64	1736+000-1738+300	2,3	M	Çanakkale	-	-	Modified habitats (I1.1, I1.4, I1.2, J5.4)	L	<i>Phalacrocorax carbo</i> <b>The great cormorant (Bird)</b> <i>Phalacrocorax pygmeus</i> <b>Pygmy cormorant (Bird)</b>	M	Criterion 3	Tier 2 (e)	Criterion 3	L	* Closed construction period: 1 February-30 March because of the flood season which constitute a wetland for congregatory bird species. <b>For Bird Species (<i>Phalacrocorax carbo</i>, <i>Phalacrocorax pygmeus</i>)</b> * The top soil between 1736+000 - 1738+300 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * If the activity is intensive on the construction site and if the construction works have the risk of disturbing the members of the populations, construction should be stopped until the species leave the site. <b>For Habitat</b> * The top soil between 1736+000 - 1738+300 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH65	1741+100-1741+500	0,4	M	Çanakkale	-	-	E1.22	H	<i>Spermophilus citellus</i> <b>The European ground squirrel (Mammalia)</b>	L	Criterion 2	Tier 2 (b)	Criterion 2	L	<b>For Mammalian Species (<i>Spermophilus citellus</i>)</b> * The top soil between 1741+100 - 1741+500 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * If <i>Spermophilus citellus</i> individuals will be seen, they shall be carried to the appropriate and close areas by specialists according to the methodology. <b>For Habitat</b> * The top soil between 1741+100 - 1741+500 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH66	1788+300-1788+500	0,2	M	Edirne	-	-	G2.1	M	<i>Myomimus roachi</i> <b>Mouse-tailed Dormouse (Mammalia)</b>	L	Criterion 2	Tier 2 (b)	Criterion 2	L	<b>For Mammalian Species (<i>Spermophilus citellus</i>)</b> * The top soil between 1788+300 - 1788+500 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW. * If <i>Spermophilus citellus</i> individuals will be seen, they shall be carried to the appropriate and close areas by specialists according to the methodology. <b>For Habitat</b> * The top soil between 1788+300 - 1788+500 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.
CH67	1800+600-1805+000	4,4	H	Edirne	-	-	G1.3	M	<i>Phalacrocorax carbo</i> <b>The great cormorant (Bird)</b> <i>Phalacrocorax pygmeus</i> <b>Pygmy cormorant (Bird)</b>	M	Criterion 3	Tier 2 (e)	Criterion 3	L	* Closed construction period: 1 February-30 March because of the flood season which constitute a wetland for congregatory bird species. <b>For Bird Species (<i>Phalacrocorax carbo</i>, <i>Phalacrocorax pygmeus</i>, <i>Cygnus olor</i>, <i>Cygnus Cygnus</i>, <i>Pelecanus onocrotalus</i>)</b>

CRITICAL HABITAT NO	KP	TOTAL LENGTH (km)	PRIORITY*	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	CRITERION	EUNIS HABITAT	HABITAT SENSITIVITY*	SCC SPECIES	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	FINAL CRITERION	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)*	MITIGATION MEASURES
									<i>Cygnus olor</i> <b>The mute swan (Bird)</b>	M	Criterion 3	Tier 2 (e)			<p>* The top soil between 1800 + 600 -1805+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p> <p>* If the activity is intensive on the construction site and if the construction works have the risk of disturbing the members of the populations, construction should be stopped until the species leave the site.</p> <p><b>For Habitat</b></p> <p>* The top soil between 1800 + 600 -1805+000 KP's shall be scraped at a depth of 10-15 cm and shall be stored near the ROW.</p>
								<i>Cygnus cygnus</i> <b>The whooper swan (Bird)</b>	M	Criterion 3	Tier 2 (e)				
								<i>Pelecanus onocrotalus</i> <b>The great white pelican (Bird)</b>	M	Criterion 3	Tier 2 (e)				

\*H: High  
M: Medium  
L: Low

## Annex 2. Freshwater Critical Habitat Assessment

CRITICAL HABITAT NO	CRITICAL HABITAT NAME (RIVER NAME)	KP	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	EUNIS HABITAT	PRIORITY	SCC (IF ANY)	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)	MITIGATION MEASURES
FCH1	Kura River	71+710-71+755	Ardahan	PUTKA-GÖLBAŞI BUFFER ZONE	C2.2	M	-	-	Criterion 4	-	L	<p>*No activities should be carried out in the spawning periods (end of April-beginning of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH2	Unknown Creek	166+450-166+571	Kars	-	C2.3	L	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (end of April-beginning of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH3	Süngütaşı River	220+177-220+211	Erzurum	-	C2.3	L	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (end of April-beginning of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH4	Kızıllararkı River	269+680-269+696	Erzurum	-	C2.3	M	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (end of April-beginning of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>

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FCH5	Büyükdere River	280+401-280+414	Erzurum	-	C2.3	L	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (end of April-begining of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH6	Abitçayırılığı River	332+830-332+845	Erzurum	-	C2.3	L	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (end of April-begining of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH7	Baş River	353+584-353+613	Erzurum	-	C2.3	L	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (end of April-begining of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH8	Karasu River	372+760-372+903	Erzurum	-	C2.3	M	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (end of April-begining of July).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>

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FCH9	Değirmendere River	504+756-504+770	Gümüşhane	-	C2.3	L		H	Criterion 1	Tier 1 (a/b)	L	*No activities should be carried out in the spawning periods (end of April-beginning of July). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.
									Criterion 2	Tier 2 (b)		
									Criterion 2	Tier 2 (b)		
FCH10	Unknown Creek-Öğütlü village	508+498-508+510	Gümüşhane	-	C2.3	M		M	Criterion 2	Tier 2 (b)	L	*No activities should be carried out for Salmonid between December-November; for Oxyneomacheilus kosswigi between May-June in the spawning periods (end of April-beginning of July). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.
									Criterion 2	Tier 2 (b)		
									Criterion 2	Tier 2 (b)		
FCH11	Hafik	709+815-709+897	Sivas	HAFIK ZARA HILLS (KBA, IPA, IBA)	C2.3	L		M	Criterion 2, 4	Tier 2 (b)	L	*No activities should be carried out in the spawning periods (April-July). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.
FCH12	Yıldız River	763+361-763+381	Sivas	-	C2.3	L	-	-	-	-	L	*No activities should be carried out in the spawning periods (April-July). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.

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FCH13	Delice Stream	983+388-983+432	Yozgat	-	C2.3	M	<i>Cobitis simplicispinna</i> (Fish)	M	Criterion 2	Tier 2 (b)	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH14	Kılıçözü River	1035+368-1035+377	Kırıkkale	-	C2.3	L	<i>Cobitis simplicispinna</i> (Fish)	-	-	-	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Manage all construction activities to the maximum extent possible in order to avoid or minimize soil erosion, sedimentation and impacts to aquatic and riparian vegetation at the crossing.</p>
FCH15	Kızılırmak River	1087+890+1087+980	Kırıkkale	-	C2.2	M	-	-	-	-	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH16	Sakarya River	1214+260-1214+290	Eskişehir	ACIKIR STEPPES (KBA, IPA)	C2.3	M	-	-	Criterion 4	-	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>

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FCH17	Seydi Stream	1315+643-1315+665	Eskişehir	-	C2.3	L			<i>Cobitis simplicispinna</i> (Fish)	M	Criterion 2	Tier 2 (b)	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
									<i>Gobio obtusirostris</i> (Fish)	M	Criterion 2	Tier 2 (b)		
FCH18	Seydi Stream	1323+270-1323+300	Eskişehir	-	C2.3	L			<i>Cobitis simplicispinna</i> (Fish)	M	Criterion 2	Tier 2 (b)	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
									<i>Gobio obtusirostris</i> (Fish)	M	Criterion 2	Tier 2 (b)		
									<i>Chondrostoma angoranse</i> (Fish)	M	Criterion 2	Tier 2 (b)		
FCH19	Tributary of Uludere	1396+221-1396+237	Eskişehir	-	C2.3	L			<i>Gobio obtusirostris</i> (Fish)	M	Criterion 2	Tier 2 (b)	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing.</p> <p>*Avoid impacts and removal to gravel areas at the crossing.</p> <p>*Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.</p>
FCH20	Tributary of Kocasu Stream-Soğucak	1461+293-1461+349	Kütahya	-	C2.3	M			<i>Oxyneomacheilus simavica</i> (Fish)	H	Criterion 1	Tier 1 (a/b)	L	<p>*No activities should be carried out in the spawning periods (April-June).</p> <p>*Control sediment release into the river bed.</p> <p>*Manage all construction activities to the maximum extent possible in order to avoid or minimize soil erosion, sedimentation and impacts to aquatic and riparian vegetation at the crossing.</p>
											Criterion 2	Tier 2 (b)		

CRITICAL HABITAT NO	CRITICAL HABITAT NAME (RIVER NAME)	KP	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	EUNIS HABITAT	PRIORITY	SCC (IF ANY)	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)	MITIGATION MEASURES
FCH21	Aliova Stream	1553+697-1553+730	Bursa	-	C2.3	M	<i>Oxyneomacheilus simavica</i> (Fish)	H	Criterion 1	Tier 1 (a/b)	L	*No activities should be carried out in the spawning periods (April-June). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.
FCH22	Sarp Creek	1565+865-1565+885	Bursa	-	C2.3	L	<i>Cobitis fahirae</i> Aegean spined loach (Fish)	M	Criterion 2	Tier 2 (b)	L	*No activities should be carried out in the spawning periods (April-June). *Control sediment release into the river bed. *Manage all construction activities to the maximum extent possible in order to avoid or minimize soil erosion, sedimentation and impacts to aquatic and riparian vegetation at the crossing.
FCH23	Simav Stream	1590+290-1590+362	Balıkesir	-	C2.3	M	<i>Oxyneomacheilus simavica</i> (Fish)	H	Criterion 1	Tier 1 (a/b)	L	*No activities should be carried out in the spawning periods (April-June). *Control sediment release into the river bed. *Manage all construction activities to the maximum extent possible in order to avoid or minimize soil erosion, sedimentation and impacts to aquatic and riparian vegetation at the crossing.
FCH24	Mürvetler Stream	1605+400-1605+425	Balıkesir	-	C2.3	M	<i>Cobitis punctulata</i> (Fish)  <i>Cobitis fahirae</i> Aegean spined loach (Fish)	H  M	Criterion 1 Criterion 2 Criterion 1 Criterion 2	Tier 1 (a/b) Tier 2 (b) Tier 1 (a/b) Tier 1 (a) Tier 2 (b)	L	*No activities should be carried out in the spawning periods (April-June). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.

CRITICAL HABITAT NO	CRITICAL HABITAT NAME (RIVER NAME)	KP	PROVINCE	PROTECTED AREA / HIGH BIODIVERSITY AREA (IF INTERSECTS)	EUNIS HABITAT	PRIORITY	SCC (IF ANY)	PRIORITY	CRITERION	INDICATIVE TIER (QUANTITATIVE ASSESSMENT)	IMPACT LEVEL (QUANTITATIVE ASSESSMENT)	MITIGATION MEASURES
FCH25	Manyas-Kocacay Stream	1613+360-1613+419	Balıkesir	-	C2.3	M		H	Criterion 1 Criterion 2	Tier 1 (a/b) Tier 1 (a)	L	*No activities should be carried out in the spawning periods (April-June). *Control sediment release into the river bed. *Manage all construction activities to the maximum extent possible in order to avoid or minimize soil erosion, sedimentation and impacts to aquatic and riparian vegetation at the crossing.
								M	Criterion 2	Tier 2 (b)		
FCH26	Gönen Stream	1651+548-1651+598	Balıkesir	-	C2.3	M		H	Criterion 1 Criterion 3	Tier 2 (c) Tier 2 (b)	L	*No activities should be carried out in the spawning periods (April-June). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.
FCH27	Biga Stream	1689+784-1689+838	Çanakkale	-	C2.3	M		M	Criterion 2	Tier 2 (b)	L	*No activities should be carried out in the spawning periods (April-June). *Control sediment release into the river bed. *Minimize construction activities to avoid or minimize soil erosion, sedimentation and impacts to riparian vegetation at the crossing. *Avoid impacts and removal to gravel areas at the crossing. *Install silt screens and sediment traps prior to initiating construction crossing activities and maintain the screens and traps during the crossing to prevent or minimize downstream sedimentation.

H: High  
M: Medium  
L: Low

**Annex 3. Assessment of the natural habitat types which intersect with the TANAP Project route**

EUNIS HABITAT TYPE	Sensitivity *	Coverage in 500 m Corridor (ha)	Coverage in 36 m (ha)	Degree of Degradation for 36 m in 500 m Corridor (%)	Impact Level	Mitigation Measures	Remarks
B1.6 Coastal dune scrub	H	6,124	0,2373	3,87	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Minimise scrub clearance	Along the entire TANAP Project route, this habitat type can be seen only in semi-humid areas right behind the coastal dunes within the borders of Tekirdağ. EUNIS Level III classification for whole Turkey isn't known for now. We know that dune habitats are present along to the Blacksea, Marmara Sea, Aegean Sea and Mediterranean Sea <sup>1</sup> . Top soil management is sufficient for the recovery of this habitat according to the local experts.
B2.2 Unvegetated mobile shingle beaches above the driftline	H	0,182	0,041	22,53	L	* Top soil management (Topsoil stripping at full depth before construction with shingles on it, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)	Along the entire TANAP Project route of 500m study corridor, this habitat type exists only in the seaside of Çanakkale, which is located near the Marmara Sea. However, regarding the literature data <sup>1</sup> , it is known that dune habitats are present along the Blacksea, Marmara Sea, Aegean Sea and Mediterranean Sea, despite the EUNIS Level III classification for whole Turkey is not currently available. Therefore, top soil management is sufficient for the recovery of this habitat according to the local experts.
B3.3 Rock cliffs, ledges and shores, with angiosperms	M	0,703573	-	-	-	-	36 m ROW corridor no longer intersects with B3.3 habitat.
E1.00 Anatolian gypsum steppes	H	1483,487	78,45	5,29	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Implement strategies for soil protection * Storing the gypsum rocks without mixing them with the top soil (for some parts) * Seed collection from endemic flora species * Translocation for some endemic flora species * Relocation for some endemic flora species	This habitat type is quite common around Sivas, Çankırı and Erzincan in Turkey. It can also be seen in small fragments in several provinces of the Central Anatolia, including Eskişehir and Kırşehir. Along the route, this habitat type was identified in Sivas, Eskişehir and Kırşehir. As gypsum habitat differs slightly from province to province, the endemic species distributed in the gypsum habitats in each province vary as well. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
E1.01 Marl Steppe	H	477,819	27,304	5,71	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Terracing to prevent erosion (for some parts) * Seed collection from endemic flora species * Implementation of re-vegetation	Marl steppe habitat can be seen in discrete forms in several parts of the Central Anatolia. The composition of plant communities differ from region to region. It can be seen in Ankara and Eskişehir along the project route. The soil is very poor in organic matter. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
E1.22 Arid subcontinental steppic grassland	H	576,032	42,768	7,42	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)	Arid subcontinental steppic grassland habitat can be seen in Bursa, Balıkesir, Çanakkale and Edirne along the route. This habitat type is the Marmara Region vicariant of the Irano-Turanian-Anatolian Steppe habitat, widely distributed in the Central and East Anatolia Regions. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
E1.2B Serpentine steppes	H	800,674	54,594	6,82	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Implement strategies to minimize impacts to soil structure, quality and capability * Seed collection from endemic flora species * Implementation of re-vegetation	Serpentine steppe is found in Erzincan and Sivas along the route. This habitat type is also present in Burdur Province <sup>3</sup> . Vegetation cover of the plants growing in this habitat is poor, whereas the rate of endemism is quite high. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
E1.2E Irano-Anatolian steppes	H	14409,69	941,7738	6,54	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Seed collection from endemic flora species * Stones and rocks should be stored nearby the construction site (for some parts) * Terracing to prevent erosion (for some parts) * Implementation of re-vegetation	Irano-Anatolian steppe, one of the most frequent habitat types along the route, can be seen in Erzurum, Kars, Erzincan, Sivas, Gümüşhane, Bayburt, Giresun, Yozgat, Kırşehir, Ankara, Eskişehir and Bilecik. This habitat type is also present in Burdur Province <sup>3</sup> . Mitigation measures are sufficient for the recovery of this habitat according to the local experts.

EUNIS HABITAT TYPE	Sensitivity *	Coverage in 500 m Corridor (ha)	Coverage in 36 m (ha)	Degree of Degradation for 36 m in 500 m Corridor (%)	Impact Level	Mitigation Measures	Remarks
E2.1 Permanent mesotrophic pastures and aftermath-grazed meadows	M	2073,965	153,263	7,39	L	* Top soil management (top soil stripping at a depth of 10 – 15 cm and storing near the ROW appropriately for use in bio restoration phase)	This habitat type is quite common in the East Anatolia Region. Natural mesotrophic pastures are harvested by local people in late June and July each year to provide winter feed for livestock. Therefore, this habitat can be considered as a modified habitat. This habitat type can be seen in the Ardahan, Kars and Erzurum along the TANAP Project route. Top soil management is sufficient for the recovery of this habitat according to the local experts.
E2.5 Meadows of the steppe zone	H	287,2358	16,049	5,59	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Seed collection from endemic flora species * Implementation of re-vegetation	This habitat type can be seen in Erzincan, Sivas, Ankara and Tekirdağ along the route. It develops around small water sources within the Irano-Turanian steppe and is characterised by herbaceous species. The water demand of these species is more than those of the steppe species. In this habitat, in general, cosmopolitan species are distributed. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
E3.4 Moist or wet eutrophic and mesotrophic grassland	M	587,3364	33,598	5,72	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Seed collection from endemic flora species * Minimise riparian disturbance wherever practicable * Rehabilitation of the riparian vegetation, aquatic and semi aquatic areas (Plant nursery trees of minimum 2 years old up to 5 years old, transplantation, translocation etc.)	Moist or wet eutrophic and mesotrophic grassland formations can be seen in Ardahan, Kars, Erzurum, Sivas and Çanakkale along the route. Plants with a high water demand grow in this habitat. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
E4.4 Calcareous alpine and subalpine grassland	M	3934,294	283,532	7,21	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Seed collection from endemic flora species * Implementation of re-vegetation	Calcareous alpine and subalpine grassland formations can be seen in Ardahan, Kars and Erzurum along the route. This habitat type is very common particularly above 2,000 m in Ardahan. The E4.4 habitat type covers wide areas in the East Anatolia Region. Occasionally, the subalpine grassland and wet grassland habitats merge into each other depending upon the level of the groundwater. Both habitat types can be observed in this area nearby a temporary creek, fed by the waters of this creek. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
E6.2 Continental inland salt steppes and marshes	H	81,662	5,351	6,55	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Top soil stripping in layers of 10-15 cm depth, together with the plants on it, and storing nearby the ROW * Seed collection from endemic flora species * Rehabilitation of the riparian vegetation, aquatic and semi aquatic areas (Plant nursery trees of minimum 2 years old up to 5 years old, transplantation, translocation etc.)	Along the project route, one of the most interesting, most sensitive and most important (in terms of biodiversity) habitat is the continental inland salt steppes. This habitat type can only be seen in the Erzurum Plain along the TANAP Project route. But according to the literature studies, E6.2 habitat type is distributed in Ankara <sup>2</sup> . Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
F2.2 Evergreen alpine and subalpine heath and scrub	M	24,009	0,748	3,12	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Minimise scrub clearance * Seed collection from endemic flora species * Implementation of re-vegetation	This habitat type is seen only in Erzincan along the route. This habitat type is observed in elevations of the northern part of the Central Anatolia Region and in the elevations of the East Anatolia Region. This habitat type, characterised by short and creeping plants and shrubs. Mitigation measures are sufficient for the recovery of this habitat according to the local experts.
F5.3 Pseudomaquis	M	77,806	4,409	5,67	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)	Pseudomaquis formation can be seen only in Balıkesir along the route. In consequence of the destruction of the maquis vegetation in the Marmara Region, a pseudomaquis habitat developed, which is mainly dominated by species in the form of thornbush. Top soil management is sufficient for the recovery of this habitat according to the local experts.
G1.1 Riparian and gallery	M	31,65	1,86	5,89	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW)	Such woodlands are distributed only around Posof in Ardahan along the route. This habitat type is also present in Burdur Province <sup>3</sup> . This habitat found along

EUNIS HABITAT TYPE	Sensitivity *	Coverage in 500 m Corridor (ha)	Coverage in 36 m (ha)	Degree of Degradation for 36 m in 500 m Corridor (%)	Impact Level	Mitigation Measures	Remarks
woodland, with dominant [ <i>Alnus</i> ], [ <i>Betula</i> ], [ <i>Populus</i> ] or [ <i>Salix</i> ]						<ul style="list-style-type: none"> <li>appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Minimise riparian disturbance wherever practicable</li> <li>* Seed collection from non-endemic natural plants of the region to control erosion</li> <li>* Rehabilitation of the riparian vegetation, aquatic and semi aquatic areas (Plant nursery trees of minimum 2 years old up to 5 years old, transplantation, translocation etc.)</li> <li>* Implementation of biorestation techniques soon after construction prevents erosion</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> </ul>	river banks. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G1.3 Mediterranean riparian woodland	M	839,895	53,58	6,38	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Minimise riparian disturbance wherever practicable</li> <li>* Implementation of biorestation techniques soon after construction to prevents erosion</li> <li>* Rehabilitation of the riparian vegetation, aquatic and semi aquatic areas (Plant nursery trees of minimum 2 years old up to 5 years old, transplantation, translocation etc.)</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> </ul>	Mediterranean riparian woodlands, one of the most frequent habitat types along the route, can be seen in Erzurum, Sivas, Gümüşhane, Yozgat, Bilecik, Bursa, Balıkesir, Çanakkale and Edirne along the route. This habitat found along river banks. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G1.7 Thermophilous deciduous woodland	M	3497,033	165,92	4,74	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Store stones and rocks nearby the ROW (for some parts)</li> <li>* Seed collection from endemic flora species</li> <li>* Translocation (for some endemic flora species)</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> <li>* Implementation of re-vegetation</li> </ul>	Thermophilous deciduous woodland habitat, one of the most frequent habitat types along the route, was observed in Sivas, Gümüşhane, Yozgat, Eskişehir, Bilecik, Kütahya, Bursa, Balıkesir, Çanakkale, and Kırklareli along the route. The characteristic tree species of such woodlands are oaks. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G1.9 Non-riverine woodland with [ <i>Betula</i> ], [ <i>Populus tremula</i> ] or [ <i>Sorbus aucuparia</i> ]	H	202,86	9,94	4,9	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Narrowed down the construction corridor (in Posof WDA)</li> <li>* Time constraint (Complete construction works between August-October)</li> <li>* Minimise tree felling</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> </ul>	Natural <i>Betula pendula</i> woodlands are distributed only in Ardahan in along the project route. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G1.A Meso- and eutrophic [ <i>Quercus</i> ], [ <i>Carpinus</i> ], [ <i>Fraxinus</i> ], [ <i>Acer</i> ], [ <i>Tilia</i> ], [ <i>Ulmus</i> ] and related woodland	H	211,075	12,032	5,70	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> </ul>	This habitat type is rather seen around Posof, Ardahan along the route. This habitat is more arid compared to <i>Betula pendula</i> woodlands. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.

EUNIS HABITAT TYPE	Sensitivity *	Coverage in 500 m Corridor (ha)	Coverage in 36 m (ha)	Degree of Degradation for 36 m in 500 m Corridor (%)	Impact Level	Mitigation Measures	Remarks
G2.1 Mediterranean evergreen [ <i>Quercus</i> ] woodland	M	1800,649	7,172	3,97	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> </ul>	Although this habitat is widespread in the Mediterranean Basin and in Turkey in the Mediterranean and the Aegean Regions, it is seen in the Thrace Region, Çanakkale, Edirne and Tekirdağ along the route. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G3.4 [ <i>Pinus sylvestris</i> ] woodland south of the taiga	H	1038,144	54,265	5,23	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Seed collection from endemic flora species</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> <li>* Implementation of re-vegetation</li> <li>* Store stones and rocks of 30 cm or larger without mixed them with the top soil (for some parts of the habitat)</li> </ul>	Natural <i>Pinus sylvestris</i> woodlands can be seen in Ardahan, Erzincan, Kars and Sivas along the route. One of the best representatives of this habitat is the Sarıkamış Forest. The dominant tree species of this habitat is <i>Pinus sylvestris</i> . However, <i>Populus tremula</i> woodlands can also be found, albeit infrequently, in the openings of <i>Pinus sylvestris</i> woodlands. This habitat is locally important both for their habitat characteristics and the local range species they host. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G3.5 [ <i>Pinus nigra</i> ] woodlands	H	997,723	52,73	5,28	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Seed collection from endemic flora species</li> <li>* Terracing to prevent erosion (for some parts)</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> <li>* Implementation of re-vegetation</li> </ul>	<i>Pinus nigra</i> woodlands can be seen in Bilecik and Bursa along the route. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G3.75 [ <i>Pinus brutia</i> ] forests	M	281,1905	16,54	5,88	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Seed collection from endemic flora species</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> <li>* Implementation of re-vegetation</li> </ul>	This habitat type is widespread in the Mediterranean Basin in the world, and in Turkey in the Mediterranean and the Aegean Regions between 0-1,000 m. <i>Pinus brutia</i> forests can be seen in Bursa and Edirne along the route. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G3.9 Juniperus woodland	M	175,186	9,2129	5,26	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> <li>* Implementation of re-vegetation</li> </ul>	<i>Juniperus</i> woodlands can be seen only in Kars and Kütahya along the route. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G3.F Highly artificial coniferous plantations	L	2146,199	140,79	6,56	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry</li> </ul>	Highly artificial coniferous plantation habitat can be seen in Ardahan, Erzincan, Bursa, Çanakkale, Edirne and Tekirdağ along the TANAP Project route. The planted pines vary from region to region. While plantations of <i>Pinus sylvestris</i> are common in Ardahan and Erzincan, <i>Pinus pinaster</i> , <i>Pinus pinea</i> , <i>Pinus brutia</i> and <i>Cupressus sempervirens</i> plantations exist in the western provinces. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
G4.B Mixed mediterranean [ <i>Pinus</i> ] - thermophilous [ <i>Quercus</i> ] woodland	M	674,463	37,24	5,52	L	<ul style="list-style-type: none"> <li>* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase)</li> <li>* Minimise tree felling</li> <li>* Seed collection from endemic flora species</li> <li>* Reforest at least equal to the cut trees appointed by</li> </ul>	Along the route, in the Bursa province the <i>Pinus nigra</i> woodlands developing on serpentine main rock and the mixed oak woodlands are locally important, both for their habitat characteristics and the local range species they host. In Bursa section of the route, black pine and deciduous mixed oak forests form pure communities at some points, while black pines and deciduous oaks together form mixed forests in some other areas. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of

EUNIS HABITAT TYPE	Sensitivity *	Coverage in 500 m Corridor (ha)	Coverage in 36 m (ha)	Degree of Degradation for 36 m in 500 m Corridor (%)	Impact Level	Mitigation Measures	Remarks
						the Regional Directorates of Forestry * Implementation of re-vegetation	this habitat according to the local experts.
G5.1 Line of trees on field and roadside	L	121,8357	7,70	6,32	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Minimise tree felling * Reforest at least equal to the cut trees appointed by the Regional Directorates of Forestry	This habitat represents the line of trees between fields and can be seen only in Ardahan along the route. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.
H5.3 Sparsely-vegetated habitats	M	10,2148	-	-	-	-	36 m ROW corridor no longer intersects with H5.3 habitat.
X18 Wooded step	L	789,0951	50,56	6,41	L	* Top soil management (Topsoil stripping at full depth before construction, storing near the ROW appropriately during the construction and spread properly on ROW in reinstatement phase) * Minimise tree felling * Seed collection from endemic flora species * Implementation of re-vegetation	This habitat type is widespread in Turkey, can be seen in Erzincan, Giresun, Kütahya and Bursa along the route. The trees are sparse and the openings are steppes. Thus, steppe species are more widespread. Mitigation measures for trees are compensation and other mitigation measures are sufficient for the recovery of this habitat according to the local experts.

<sup>1</sup> Ertek, A., Formation of coastal dunes, their progression, distribution and some problematic dune areas from Türkiye, 7th Coastal Engineering Symposium, 15-22 pp.

<sup>2</sup> Mergen, O, Karacaoğlu, C, 2015, Tuz Lake Special Environment Protection Area, Central Anatolia, Turkey: The EUNIS Habitat Classification and Habitat Change Detection between 1987 and 2007, Ecology, 24, 95, 1-9 (In Turkish).

<sup>3</sup> Özçelik, H, Çinbilgel, İ, Muca, B, Koca, A, Tavuç, İ, Bebekli, Ö, 2014, Burdur İli Karasal ve İç Su Ekosistem Çeşitliliği, Koruma ve İzleme Çalışmaları, SDU Journal of Science (E-Journal), 9 (2): 12-43 (In Turkish).

\* The sensitivity levels of habitats are defined in accordance with National Biological Diversity Strategy and Action Plan.

H: High

M: Medium

L: Low

NOTE: EUNIS Level III classification for whole Turkey isn't known for now. The Level 3 EUNIS Habitat Map for 500 m study corridor, created from CORINE Land Cover, satellite imagery, aerial photos and existing literature. Baseline data collection was collected to confirm the distribution of the habitats defined at desktop level adopting the EUNIS standardized habitat system within the 500 m corridor.

**Annex 4. Assessment of the protected and conservation areas which intersects with the TANAP Project route**

Protected and conservation area name	National or International Status	Province	Area size [ha]	Area intersected by the 36 m corridor [ha]	Degree of habitat loss/degradation/conversion pre mitigation %	Impact Level
Posof Wildlife Development Area (Posof Forests) including Posof PBA	Wildlife Development Area, KBA, PBA	Ardahan	65666,81	117,25	0,18	L
Ardahan Forests	IBA, KBA	Ardahan	25562,01	66,69	0,26	L
Putka Gölbaşı Wetland (buffer zone)	Wetland	Ardahan	4181,536	25,28	0,60	L
Allahuekber Mountains	KBA	Erzurum, Kars	295918,9	127,589	0,04	L
Sarıkamış National Park (Sarıkamış Forests) including Sarıkamış PBA	National Park, Wildlife Protection Area, IBA, KBA, PBA	Kars, Erzurum	78927	80,86	0,10	L
Erzurum Marsh Wetland	Wetland, KBA	Erzurum	15911,13	70,68	0,44	L
Gölova Lake(s)	Wetland, KBA	Sivas	4932	6,19	0,13	L
Refahiye Forests	KBA	Erzincan, Sivas	240610,78	117,77	0,05	L
Hafik and Zara Hills	IBA, KBA, IPA	Sivas	103108,95	199,1	0,19	L
Mağara Lake Buffer Zone	Wetland	Sivas	1310,68	8,85	0,68	L
Bataklıküzü 2 Wetland	Wetland	Sivas	674,96	8,52	1,26	L
Çoraklık Lake Wetland	Wetland	Sivas	391,44	7,81	2,00	L
Tuzlu Lake Wetland	Wetland	Sivas	55,05	1,63	2,96	L
Balıkıkaya Wetland	Wetland	Sivas	1129,03	2,7	0,24	L
Acıkır Steppe	KBA, IPA	Eskişehir, Ankara	98399,99	148,25	0,15	L
Manyas Lake (row, buffer zone)	National Park, Ramsar Area, Natural Sit Area, IBA, KBA	Balıkesir	43462,18	18,18	0,04	L
Saros Gulf	SEPA, IBA, KBA	Çanakkale	81971,12	11,07	0,01	L

## **Annex 5. Impact Assessment Methodology**

The overall methodology for impact assessment is described in Chapter 3; this appendix provides details of the impact calculation methodology based on the GIS system. The basic elements of the methodology are:

- Project components:
- Impact factors
- Sensitivity elements
- Assessment endpoints
- Impacts

### Project Components

These elements are summarised below and the various calculations criteria and elements are provided in printed form as practical; the entire system is available on a geodatabase format.

The following is the complete list of project components used within the GIS systems for the Impact Assessment.

- T01 Pipeline onshore
- T02 Pipeline offshore
- T03 Road crossing open cut
- T04 Road crossing trenchless
- T05 Railroad crossing
- T06 Channel crossing open cut
- T07 Channel crossing trenchless
- T08 River crossing open cut
- T09 River crossing trenchless
- T10 Pipeline in HGWC
- T11 Compressor stations
- T12 Camp sites
- T13 Block valve/pigging/ metering station
- T14 Pipe stock yards
- T15 Pipeline landing
- T16 Temporary access roads
- T17 Permanent access roads

The project components are all represented on a GIS layer as polygons, built according to existing project drawings and according to some assumptions related to the production of potential impact factors during construction, operation or decommissioning phases of the Project. The project footprint is the geographic layer that collects all project components in a single feature class or shapefile. This layer has been the basis for the creation of the impact factors layers.

The polylines representing the design pipeline limits have been completed and joined in order to generate a closed area (the pipeline section) for all the pipeline project length. This resulting polygon has been split in 4 different project components according to the type of installation:

- the onshore pipeline (T01), the pipe segments along the Route onto land;
- the offshore pipeline (T02), the sub-sea section where it crosses the Dardanelles strait and the pipeline is laid on the seabed;
- the pipeline in HGWC (T10), the pipeline in High Ground Water Conditions, where a specific type of assembly is required to support the pipe segment: this project component class has been derived intersecting the design limit polygon with the map of the water logging surrounding the pipeline;
- the pipeline landing (T15), a specific land-to-water transition zone for pipeline immersion extending 500 meters offshore from the European shoreline and 200 meters offshore from the Asian shoreline.

The components from T03 to T09 have been built on a subset of selected pipeline crossing points that have been surveyed and described. Conventionally, the crossing zones of these project components have been constructed applying a buffer of 50 meters around the surveyed point. The resulting buffer polygon has been cut in order to not exceed the boundary of the construction limit area so that conventionally a crossing point is 50 meters long and wide as the construction limit.

Compressor stations (T11), Camp sites (T12), Block valve, pigging and metering stations (T13), Pipe stock yards (T14) and access roads (T16 and T17) have been directly imported as polygons from project's plants sections and drawings.

These areas and crossing zones are separate polygon objects within the project footprint and could overlap the above described pipeline sections.

The following Table 1 details the GIS data sources used to produce all the project components.

**Table 1.** GIS data source and description of the project components (PC)

Id PC	Description	GIS data source
T01	Pipeline onshore	PPL_ConstructionLimit_BCH_WGS84
T02	Pipeline offshore	PPL_ConstructionLimit_BCH_WGS84
T03	Road crossing open cut	PPL_CrossingPoints_BCH_RevH_WGS84
T04	Road crossing trenchless (Highway crossing)	PPL_CrossingPoints_BCH_RevH_WGS84
T05	Railroad crossing	PPL_CrossingPoints_BCH_RevH_WGS84
T06	Channel crossing open cut	PPL_CrossingPoints_BCH_RevH_WGS84
T07	Channel crossing trenchless	PPL_CrossingPoints_BCH_RevH_WGS84
T08	River crossing open cut	PPL_CrossingPoints_BCH_RevH_WGS84
T09	River crossing trenchless	PPL_CrossingPoints_BCH_RevH_WGS84
T10	Pipeline in HGWC (Wetland crossing)	PPL_ConstructionLimit_BCH_WGS84 GHZ_WaterLogging_BCH_WGS84
T11	Compressor stations	PPL_AGI_CS_BCH_Optimum_WGS84
T12	Camp sites	PPL_CampSites_PipeYards_BCH_TM
T13	Block valve/pigging/ metering station	PPL_AGI_BVS_AccessRoad_BCH_WGS84 PPL_AGI_BVS_BCH_WGS84 PPL_PST_AN_BCH_Optimum_WGS84 PPL_FMS_GR_BCH_Optimum_WGS84 PPL_FMS_GE_BCH_Optimum_WGS84
T14	Pipe stock yards	PPL_CampSites_PipeYards_BCH_TM
T15	Pipeline landing	PPL_ConstructionLimit_BCH_WGS84
T16	Temporary access roads	PPL_AGI_BVS_AccessRoad_BCH_WGS84
T17	Permanent access roads	PPL_AGI_BVS_AccessRoad_BCH_WGS84

### Impact factors

Impact factors (IF) are associated to each project component (PC) in the three project phases (PH): Construction, Operation, and Decommissioning; the list of Impact Factors is presented below, and they are described in detail in Chapter 3.6:

- IF01 Emission of dust and particulate
- IF02 Emission of gaseous pollutants

- IF03 Changes of local morphology
- IF04 Reduction of topsoil quality/availability
- IF05 Site restoration
- IF06 Demand for freshwater
- IF07 Demand for potable water
- IF08 Discharge of wastewater
- IF09 Cathodic protection pollutants release
- IF10 Changes in flow/circulation in natural water bodies
- IF11 Sediment suspension
- IF12 Emission of noise
- IF13 Emission of vibration
- IF14 Introduction of new buildings/infrastructures
- IF15 Removal of buildings/infrastructures
- IF16 Demand for waste disposal services
- IF17 Demand for industrial minerals (sand, gravel, etc.)
- IF18 Removal of natural vegetation
- IF19 Introduction of alien species
- IF20 Change in land use
- IF21 Demand for workforce
- IF22 Demand for goods, materials and services
- IF23 Demand for energy
- IF24 Increase of traffic
- IF25 Interruption/limitation of infrastructures/services
- IF26 Influx of workers.

### Impact factor intensity calculation

Within each factor and phase, every project component may generate a specific level of **impact intensity** that is the combination of the following assessment parameters:

- **Direction:** it can be negative (N), when the impact factor causes a worsening of the environmental state or quality, or positive (P), when the impact factor causes an improvement of the environmental state or quality.
- **Magnitude:** it is the extent of the impact factor.
- **Reversibility:** it is the possibility to restore the qualitative state of the component following the modifications occurred, considering a period from 0 to 5 years (short term) or from 6 to 50 years (long term). Over 50 years, the modifications are considered irreversible.
- **Geographic extent:** it is the area where the impact factor exerts its influence, within the route corridor (Local) or beyond (Regional) or national or more.
- **Duration:** it is the length of time when the impact factor is effective, considering less than 1 year (short) or from 1 to 3 years (medium) or more than 3 years (long).
- **Frequency:** it is how often the potential impact factor occurs.
- **Probability of occurrence:** it is the likelihood that the impact factor occurs.

The above assessment parameters are defined by **specific features** with a score assigned with professional judgment for each impact factor acting during a specific project phase.

The quantification of the environmental consequence of each impact factor is obtained by assigning a value to each feature of the assessment parameters on the basis of an expert opinion, according to the following numerical system (Table 2).

**Table 2.** Features considered for the definition of the IF Intensity and scoring scheme

Magnitude	Reversibility	Geographic extent	Duration	Frequency	Probability of occurrence
Low 5	Short term reversible 1	Local 0	Short 0	Rare 0	Unlikely 0
Medium 10	Long term reversible 3	Regional 1	Medium 1	Intermittent +1	Likely 1
High 15	Irreversible 5	Beyond regional 2	Long 2	Continuous +2	Certain 2

The tables used for the calculation of the Impact Factor Intensity for each project component and for each phase.

Each Impact Factor intensity is calculated summing the value of the assessment criteria (Magnitude, Duration, ecc.); this value can range between 7 and 27.

Then, the value obtained is normalized to 1, according to the difference between the highest and lowest values.

Finally, the class is calculated as follows:

- $L < 0,33$
- $M 0,34 \div 0,66$
- $H > 0,67$

The tables from Table 3 -Table 5 summarise the potential intensity in impact units of each impact factor per project component in the three phases of construction, operation and decommissioning.

**Table 3. Potential intensity per project component of each IF in the construction phase**

	IF01	IF02	IF03	IF04	IF05	IF06	IF07	IF08	IF09	IF10	IF11	IF12	IF13	IF14	IF15	IF16	IF17	IF18	IF19	IF20	IF21	IF22	IF23	IF24	IF25	IF26
T01	20	14	17	20		20	0	18		0	0	14	14	0		15	25	24	18	20	0	0	0	15	0	0
T02	10	14	12	0		20	0	18		0	0	9	0	0		9	15	0	13	0	0	0	0	9	15	0
T03	14	14	17	10		0	0	9		0	0	14	14	0		10	20	14	18	0	0	0	0	8	18	0
T04	9	9	12	15		9	0	9		0	0	14	19	0		10	20	14	13	0	0	0	0	8	8	0
T05	9	9	12	15		9	0	9		0	0	14	19	0		10	20	14	18	0	0	0	0	8	8	0
T06	14	14	17	10		0	0	9		20	10	14	14	0		10	20	14	18	0	0	0	0	8	15	0
T07	9	9	12	10		9	0	9		0	0	14	19	0		10	20	14	13	0	0	0	0	8	8	0
T08	14	14	17	10		0	0	9		20	20	14	14	0		10	20	24	19	0	0	0	0	7	0	0
T09	9	9	12	10		9	0	9		0	0	14	19	0		10	20	19	13	0	0	0	0	7	0	0
T10	14	14	17	15		0	0	19		20	20	14	9	0		10	20	24	18	0	0	0	0	7	0	0
T11	20	20	11	23		16	0	14		0	0	20	19	27		22	25	24	18	25	0	0	0	21	0	0
T12	21	21	0	17		17	25	22		0	0	16	11	21		22	25	24	18	21	24	24	22	21	0	21
T13	9	9	10	12		9	0	9		0	0	14	14	16		10	15	14	18	20	0	0	0	16	0	0
T14	16	16	0	19		0	0	9		0	0	16	9	16		10	15	24	18	21	24	24	12	21	0	16
T15	9	14	18	0		0	0	13		0	20	14	14	0		10	15	0	13	11	0	0	0	11	0	0
T16	14	9	13	12		9	0	0		0	0	14	14	0		10	14	18	13	11	0	0	0	10	8	0
T17	14	9	15	13		9	0	0		0	0	14	14	0		10	20	18	13	15	0	0	0	10	8	0

**Table 4. Potential intensity per project component of each IF in the operation phase**

	IF01	IF02	IF03	IF04	IF05	IF06	IF07	IF08	IF09	IF10	IF11	IF12	IF13	IF14	IF15	IF16	IF17	IF18	IF19	IF20	IF21	IF22	IF23	IF24	IF25	IF26
T01	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	12	0	0	0	0		
T02	0	0	0	0		0	0	0	11	0		0	0	16		0		0	0	0	0	0	0	0		
T03	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T04	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T05	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T06	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T07	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T08	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T09	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T10	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T11	11	22	0	24		11	17	17	0	0		22	12	27		11		11	13	24	18	18	24	11		
T12	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T13	0	0	0	14		0	0	0	0	0		12	12	16		11		11	13	19	13	13	19	11		
T14	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T15	0	0	0	0		0	0	0	11	0		0	0	0		0		0	0	0	0	0	0	0		
T16	0	0	0	0		0	0	0	0	0		0	0	0		0		0	0	0	0	0	0	0		
T17	0	0	0	14		0	0	0	0	0		10	0	0		0		11	0	14	0	0	0	11		

**Table 5. Potential intensity per project component of each IF in the decommissioning phase**

	IF01	IF02	IF03	IF04	IF05	IF06	IF07	IF08	IF09	IF10	IF11	IF12	IF13	IF14	IF15	IF16	IF17	IF18	IF19	IF20	IF21	IF22	IF23	IF24	IF25	IF26
T01	0	0	0	0	0	0		0		0		0	0		0	0	0	0	0	0	0	0	0	0	0	0
T02	0	0	0	0	0	0		0		0		0	0		0	0	0	0	0	0	0	0	0	0	0	0
T03	9	9	0	8	0	0		7		0		9	0		0	7	9	9	9	0	0	0	0	10	0	0
T04	9	9	0	8	0	0		7		0		9	0		0	7	9	9	9	0	0	0	0	10	0	0
T05	9	9	0	8	0	0		7		0		9	0		0	7	9	9	9	0	0	0	0	10	0	0
T06	9	9	0	8	0	0		7		0		9	0		0	7	9	9	9	0	0	0	0	10	0	0
T07	9	9	0	8	0	0		7		0		9	0		0	7	9	9	9	0	0	0	0	10	0	0
T08	9	9	0	8	0	0		7		0		9	0		0	7	9	14	14	0	0	0	0	10	0	0
T09	9	9	0	8	0	0		7		0		9	0		0	7	9	14	14	0	0	0	0	10	0	0
T10	9	9	0	8	0	0		7		0		9	0		0	7	9	9	9	0	0	0	0	10	0	0
T11	19	14	0	0	17	10		14		0		19	14		21	21	10	0	15	21	17	17	16	15	13	11
T12	0	0	0	0	0	0		0		0		0	0		0	0	0	0	0	0	0	0	0	0	0	0
T13	14	9	0	0	12	0		9		0		9	9		16	16	10	0	15	21	12	12	11	10	8	11
T14	0	0	0	0	0	0		0		0		0	0		0	0	0	0	0	0	0	0	0	0	0	0
T15	0	0	0	0	0	0		0		0		0	0		0	0	0	0	0	0	0	0	0	0	0	0
T16	0	0	0	0	0	0		0		0		0	0		0	0	0	0	0	0	0	0	0	0	0	0
T17	14	9	0	0	12	0		0		0		14	14		0	11	9	0	15	11	12	12	11	10	8	11

**Impact Factors spatial extent**

Every IF has a typical spatial extension that can vary in width from phase to phase. This spatial extension ranges from just the project footprint (i.e. the combination of the different PC footprints) to a larger buffer, a polygon representing the region within a specified distance from a geographic object. For instance, during the construction phase, noise can impact a region of 500 meters surrounding the pipeline footprint. The severity of the IF is considered constant – not varying in intensity - within the buffer region.

The intensity of an impact factor can therefore be limited to the project footprint or extend to a buffer around the project component generating the specific impact factor. The Table 6 shows the spatial extent (in meters) per impact factor in each project phase.

**Table 6. Spatial extent per impact factor in each project phase**

Id PC	Construction	Operation	Decommissioning
IF01	200	5000	200
IF02	500	5000	500
IF03	footprint	footprint	footprint
IF04	footprint	footprint	footprint
IF05	-	-	footprint
IF06	5000	5000	5000
IF07	1000	1000	-
IF08	1000	1000	1000
IF09	-	500	-
IF10	500	-	500
IF11	1000	-	-
IF12	500	1000	500
IF13	200	200	200
IF14	3000	3000	3000
IF15	-	-	3000
IF16	footprint	footprint	footprint
IF17	footprint		footprint
IF18	footprint	footprint	footprint
IF19	footprint	footprint	footprint
IF20	footprint	footprint	footprint
IF21	footprint	footprint	footprint
IF22	footprint	footprint	footprint
IF23	footprint	footprint	footprint
IF24	5000	5000	5000
IF25	footprint	-	footprint
IF26	footprint	footprint	footprint

In the GIS analysis environment, each impact factor has been spatially represented using the above Impact factor intensity and spatial extent tables. Where the impact extent is not limited to the project footprint, each feature class object of a project component has been buffered according to the impact factor spatial extent and the specific severity value has been assigned to the resulting polygon. Where the project component buffers overlap, the impact factor intensity cumulates to account for a concurrent, simultaneous and consequently higher potential impact.

According to this additive rule and to the different spatial extents, each of the impact layers has a different range of values and a different area of influence. Each Impact factor is represented as a geographic layer, where the impact factor intensity varies across the geographic area surrounding the pipeline project. If the same impact factor exists in all three phases, three distinct layers will be created for that specific impact factor.

### Sensitivity

The sensitivity is the sum of the conditions which characterize the present quality and/or trends of specific environmental and social components and/or of their resources.

The Valued Environmental and Social Components (**VECs**) are characterized by a sensitivity, or propensity to change, which is function of one or more intrinsic features of the components, like the presence of elements of particular value or vulnerability, or function of existing high levels of environmental degradation. The list of VECs that have been considered in the ESIA based on the results of the scoping stage is the following:

- Physical environment:
  - Meteorology and climatology
  - Air Quality
  - Noise and Vibration
  - Hydrogeology and groundwater quality
  - Geology and Geomorphology
  - Seismology
  - Soil
  - Visual aesthetics
  - Hydrology and surface water quality
  - Bottom morphology
  - Physical oceanography
  - Sea water
  - Marine Sediments
- Biological environment
  - Protected areas
  - Terrestrial Flora
  - Terrestrial Fauna
    - Birds
    - Amphibians
    - Reptiles
    - Mammals
    - Invertebrates
  - Freshwater flora
  - Freshwater fauna
    - Fish
    - Invertebrates
  - Freshwater habitats and ecosystems
  - Terrestrial habitats and ecosystems
  - Biodiversity
  - Marine Flora
  - Marine Fauna
    - Fish
    - Zoobenthos

- Mammals and reptiles
  - Marine habitats and ecosystems
  - Marine biodiversity
  - Marine protected areas
- Social environment
  - Politics and Governance
  - Settlement location
  - Demographic profile
  - Infrastructure facilities
  - Transportation and traffic
  - Economic conditions
  - Land use and agriculture
  - Employment and livelihoods
  - Social maladies
  - Social capital
  - Health issues and facilities
  - Education issues and facilities
  - Vulnerable groups
  - Cultural heritage and archaeology
  - Ecosystem services
  - Resettlement and economic displacement.

The sensitivity of the VECs is evaluated on the basis of the presence/absence of some features called **sensitivity elements** which define both the current degree of quality and the component's susceptibility to environmental changes.

The sensitivity level of each element is assigned according to the following scale:

- low;
- medium;
- high.

A sensitivity layer is a geographic feature composed by the geometries of one or more receptor types with a sensitivity value for every assessment endpoint. The values of sensitivity are classified in an ordinal scale of sensitivity units of 1, 2 and 3 or Low, Medium and High (L, M, H).

For instance, the sensitivity layer for soil potential pollution is spatially defined according to Corine Landcover polygon patches. A sensitivity of 1 (L) is assigned to the Corine Landcover class industrial areas, a sensitivity of 2 (M) to urban areas, a sensitivity of 3 (H) to agricultural areas.

Receptor geometries can be polygons (e.g. settlements, archaeological sites, protected areas, habitats), lines (e.g. roads), or points (e.g. watercourses crossings, groundwater resources) according to the resolution of the available geographic data. The sensitivity value is assigned according to a simple reclassification (see the corine landcover example above) or spatial rule and it is based on the discipline experts' evaluation. The sensitivity value is constant for the three phases and is not specific for the impact factor.

#### **Sensitivity level calculation**

The quantification of the sensitivity level is obtained by assigning a value to each sensitivity element on the basis of an expert opinion, using the available data provided with the Geodatabase.

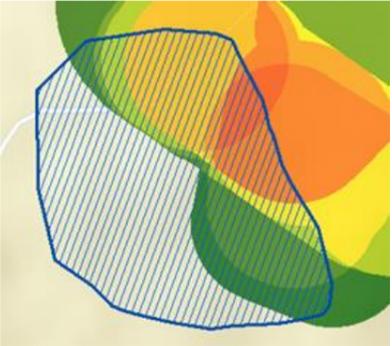
The elements and GIS layer/attribute used to evaluate the sensitivity level of each VEC are presented in the tables below, for the three main disciplines: physical, biological and social.

#### Assessment endpoints and impacts

The Assessment Endpoints (AEs) are the set of physical, biological and social parameters based on which the impacts on each VECs are measured. Furthermore, some features of VECs (e.g. landslides, seismic areas, marine erosion areas) could be regarded as risk elements for the Project.

The impact layers are derived as a spatial overlay of impact factors and sensitivity layers. For every AE the impact level is calculated for each of the individual receptors identified; from a geographical standpoint these can be a point, a line or an area. From an environmental and social standpoint receptors can be an individual settlement, a river, or an area like a homogeneous soil patch or ecosystem patch or a protected area.

There are different methods of assigning impact factor intensity to a receptor according to its spatial dimension, as described in the following scheme (Figure 1).

<p><b>POINT SENSITIVITY ELEMENT IMPACT</b></p>	<p>If the sensitivity element unit is a <b>point</b>, e.g. a river crossing, the intensity value is merely assigned according to the value of the impact factor choropleth area where the point falls.</p>	
<p><b>LINE SENSITIVITY ELEMENT IMPACT</b></p>	<p>If the sensitivity element unit is a <b>line</b>, e.g. a road, it can intersect multiple values along the impact factor layer; the value that is assigned to this element will be the <b>maximum incident value</b> (conservative approach) or the <b>weighted average value</b> determined by the length of the section that intersects that specific impact factor intensity. The impact has been averaged <b>only along the line of impact</b> resulting from the intersection between the impact layer and the sensitivity element line and has been assigned to the whole sensitivity element (conservative approach).</p>	
<p><b>POLYGON SENSITIVITY ELEMENT IMPACT</b></p>	<p>If the sensitivity element is a <b>polygon</b>, e.g. a settlement, a protected area or a habitat, the assigned value is the <b>maximum incident value</b> (for the settlements, conservative approach) or the <b>weighted average value</b>. The impact has been averaged <b>only within the effective area of impact</b> resulting from the intersection between the impact layer and the sensitivity element polygon and has been assigned to the whole sensitivity element unit (conservative approach).</p>	

**Figure 1. Methods of assigning an impact factor intensity to a sensitivity element according to its spatial dimension**

Each receptor can be affected by one or more impact factors deriving from one or more project components. The potential interactions between IF and sensitivity elements are provided in 9 matrices for the three phases of construction, operation and decommissioning and for physical, biological and social environments, respectively, presented in Chapter 3.

Using the above methods, every sensitivity element is assigned a value for each of the impact factors that apply to the specific assessment endpoint. The results of the GIS analysis are then stored in a database for the computation of the impact values and for reporting.

The total impact is given by the sum of all the impact factors intensity values overlaying a receptor and multiplied by its intrinsic sensitivity. The result is then weighted according to the sum of the maximum absolute measured values (in impact units) for the impact factors concurring to the specific impact multiplied by the maximum theoretical value of sensitivity (H or 3 in sensitivity units)

$$Impact_r = \sum_{i=1n} \frac{ImpactFactor_{ir} \times Sensitivity_r}{Max_{ImpactFactor_i} \times Max_{Sensitivity}}$$

The Impact values could range from 0% to 100% and the final class of impact is assigned using the following allocation scheme:

N	Negligible	if impact < 10%
L	Low	if 10% <= impact < 40%
M	Medium	if 40% <= impact < 70%
H	High	if impact >=70%