

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

MERSİN-GAZİANTEP RAILWAY PROJECT



SCOPING REPORT



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1 INTRODUCTION

1.1 Purpose of this Report

This Scoping Report is prepared in the pursuance of the agreement mutually signed between Rönesans Holding (Rönesans) and Assystem ENVY Energy and Environmental Investments Inc. (Assystem ENVY).

Assystem ENVY is appointed to undertake an Environmental and Social Impact Assessment Report (ESIA) in compliance with International Finance Corporation (IFC), and European Bank for Reconstruction and Development (EBRD).

This scoping report explains the studies to be fulfilled in the scope of ESIA Report to be developed.

1.2 Structure of this Report

The report is structured as follows:

- Section 1: provides a brief introduction to the project and parties that take apart;
- Section 2: describes the Project comprehensively;
- Section 3: gives environmental and social legislative framework to be complied with;
- Section 4: provides general environmental and social characteristics, baseline studies and overviews envisaged environmental impacts to be assessed in the ESIA Report.

Before preparing of the Scoping Report, a site reconnaissance survey had been performed. Addition to this, documentation were provided by Rönesans are listed below which have been evaluated to prepare Scoping Report;

- Feasibility Reports,
- Environmental Impact Assessment (EIA) Reports and Project Information Files (PIF),
- Google earth file of the Project which includes probable stations, route and quarries can be used for raw material supplier,
- plans and drawings of the Project,
- time schedule of construction activities,
- geological and geotechnical survey reports.

1.3 Background and Justification

Turkey aims to improve intermodal and multimodal applications by using the geographic advantage of Turkey so as to:

- increase the share of railway and seaway in transportation,
- to establish a fast, flexible, safe, reliable and integrated transportation system and so reduce logistic costs, trade facilitation,
- increase growing competitiveness for logistics and transportation within the scope of 11th Development Plan covering the period 2019-2023.

For this purpose:

- ongoing high speed railways will be completed,
- planning for high speed railway will be made by considering the balance of supply and demand,
- express services will be increased, and
- travel times will be shortened.

In this context, it is planned that the total length of high-speed railway, which were 1,213 km in 2018, will be increased to 5,595 km, and the share of railway passenger transportation is increased in total (on land) from 1.3% to 3.8% in 2023.

In Turkey, General Directorate of Turkish State Railways (TCDD) and General Directorate of Infrastructure Investments which are subsidiary of Ministry of Transport and Infrastructure are responsible to built and/or operate new railways.

General Directorate of Infrastructure Investments have been active to built railways, highways, ports and airports since November 1, 2011. Some of duties and responsibilities of General Directorate of Infrastructure Investments which are described in Directive On Determining Duties, Authorities And Responsibilities are listed below;

- a) preparing, have prepared or approving the plans and projects of railways, logistic villages, centers or bases, ports, shelters, coastal structures, airports to be built by the state,
- b) to construct and/or have constructed the transportation infrastructures specified in subparagraph (a) to be built, and to transfer the completed ones to the relevant organizations,
- c) to establish the junction lines of transportation infrastructures specified in subparagraph (a) and industrial sites, factories, refineries, industrial facilities, organized industrial zones, industrial zones, technology development zones, mines, industrial establishments and similar facilities to connect with railways and / or establishing and / or having highway connections done if deemed necessary.

Addition to this, General Directorate of Turkish State Railways (TCDD) is another subsidiary of Ministry of Transport and Infrastructure. TCDD has similar missions with the General Directorate of Infrastructure Investments which are listed below;

- to prepare the railway network and vehicles ready for service,
- to construct new and branch lines when necessary,
- to manage whole railway traffic effectively,
- to provide economic, safe, comfortable, technologic, environment-friendly transport service integrated with other transportation systems.

Although, new railways can be built by both TCDD and General Directorate of Infrastructure Investments, operating of railways can be done only by TCDD. Although Mersin – Gaziantep High Speed Railway Project was developed by TCDD, it has been conducted by General Directorate of Infrastructure Investments for now. Addition to this, when the construction activities of the project will be finished, TCDD will operate it.

The Mersin-Gaziantep High Speed Railway Project was developed by TCDD and expropriation and construction activities were started about year 2015. Especially construction activities have been implemented by other companies due to their contracts between companies and TCDD. In early 2020, some activities couldn't be completed by that companies and as a result Rönesans was awarded to complete the Project by General Directorate of Infrastructure Investments. Detailed information about responsibilities of the Rönesans and other companies are given in Section 2.2.2.

The studies, which has been started for the completion of Mersin-Adana-Osmaniye-Gaziantep High-speed Railway System is one of the projects serving the goals of the 11th Development Plan. The Project was awarded to REC Uluslararası İnşaat Yatırım Sanayi ve Ticaret A.Ş. under Rönesans Holding (Rönesans). The Holding has vast experience in superstructure projects, and it is one of the largest contracting companies in the world.

The railway project, 286 km in length, which is the subject of this report starts from Mersin, passes through Adana, İncirlik, Toprakkale, Bahçe, Nurdağ, Başpınar Stations respectively and ends at Mustafa Yavuz Station. Following the completion of the railway, the travel time between Adana and Gaziantep will be reduced to 1.5 hours. As a result, while the transportation cost to Mersin where there exists an international port reduces, the competition opportunities of producers, especially located in Gaziantep will increase. Because, Gaziantep is an industrial city with a population of around 2 million.

Currently, there are two lines between Mersin and Gaziantep Provinces. Rehabilitation of the available lines, construction of two new lines, electrification, signaling, and telecommunications (EST) and the connection of the line with Çukurova Airport and Tarsus are taken into consideration in the scope of the Project.

Following the implementation of the Project, the following benefits will be achieved:

- Expansion and development of the national railway network,
- Increasing the share of railways in intercity transportation,
- Providing fast, secure, uninterrupted and economical transportation,
- Reducing intercity logistic costs,
- Ensuring safe traffic and station management with an effective capacity of the national railway network,
- Integration of railway infrastructure with other transportation systems.

1.4 Nature of the Project

The main scope of the Project is to construct and rehabilitate the high-speed railway between Mersin and Gaziantep Provinces of Turkey.

Two high-speed railway lines are planned between Mersin and Gaziantep Provinces. The construction works has been started, however could not be completed as of today. Rönesans shall complete the rest of works including the mining activities (due to material supply) for the railway system, and continuous transportation will be maintained between Mersin and Gaziantep. The construction of the railway system is scheduled to be completed in 34 months, and it is followed by 24 months guarantee period.

Railway construction and mining activities require a full impact assessment study. Therefore, this Scoping Report is prepared to define the key issues regarding the technical studies to be undertaken within the Environmental and Social Impact Assessment (ESIA) process.

The ESIA report, which will ensure that all impacts are duly defined and the negative impacts are mitigated as best as practical, will be developed in accordance with the requirements of International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD).

The Project was developed in parts by TCDD and for each part of the Project, feasibility studies had been done and Feasibility Reports have been prepared. In Feasibility Reports, the Project aims to;

- providing safe and economical passenger and freight transportation,
- reducing road transport burden,
- decreasing emissions sourced by transportation,
- decreasing travel time on the route,
- creating a continuity and economic solution in raw material transfer between Mersin Port and Gaziantep with new railway lines.

1.5 EIA Development

The EIA process in Turkey is subject to the National EIA Regulation (Official Gazette dated 25.11.2014 and numbered 29186) issued by the Ministry of Environment and Urbanization (MoEU) in 2014 (last version). This Bylaw aims to regulate administrative and technical principles and procedures for the EIA process.

Pursuant to the EIA Regulation (MoEU-2014), it is obligatory to prepare EIA report for the activities listed in Annex-1. This Annex lists the activities, which are likely to have significant environmental and/or social impacts. The activities, which would have less adverse impacts than those in Annex-1, are listed in the Annex-2 of the EIA Regulation. For these activities, pre-EIA reports should be prepared. For each activity covered by the EIA Regulation, necessary reporting should be done to MoEU (for Annex-1 activities) or their Provincial Directorates (for Annex-2 activities), and the decision of the authority should be taken prior to commencement of the activity.

Railway projects longer than 100 km are listed by Annex -1, while other railway projects such as the ones shorter than 100 km, railway route changes longer than 30 km, and duplication of the lines fall under Annex - 2.

To date, various reports submitted to the authorized bodies, and their decisions have been secured. These decisions are listed in Table 1.1.

Table 1.1: Decisions secured in the scope of EIA Regulation

No	Location	Scope	Decision
1	Mersin-Adana Railway Project (3 rd and 4 th Line Addition)	EIA Regulation - Annex-II - Article 31 (g)	EIA is not required Dated 10.07.2015 and Decision No. 2015531
2	Adana-Toprakkale Railway Project (2 nd Line Addition)	EIA Regulation - Annex-I - Article 9 (a)	EIA is positive Dated 19.06.2012 and Decision No. 2577
3	Toprakkale-Bahçe Railway Project	EIA Regulation - Annex-II - Article-33 (g) & (ğ)	EIA is not required Dated 05.05.2014 and Decision No. 201464
4	Bahçe-Nurdağ Railway Project	EIA Regulation - Annex-I - Article 9	EIA is positive Dated 05.10.2011 and Decision No. 2309
5	Nurdağ-Başpınar Railway Project	EIA Regulation - Annex-II - Article 31 (e)	EIA is not required Dated 25.03.2013 and Decision No. 2834

1.6 Roles and Responsibilities

1.6.1 Rönesans

Rönesans Holding, which was established in 1993, is currently operating as main contractor and investor in 28 countries around the globe. The Holding is engaged in the main fields of construction, real estate development, energy, industrial facilities, and healthcare.

The Holding is engaged in the main fields of building/infrastructure construction, industrial construction, real estate development and concessions. Under building/infrastructure construction, various group companies of the Holding operates; such as Rönesans Construction Turkey, Russia and MEA, Heitkamp and Ballast Nedam. Rönesans Heavy Industries, Ballast Nedam and Heitkamp also engages industrial construction projects. Holding successfully operates PPP projects via its group companies Rönesans Healthcare Investment, Rönesans Facility Management, and Ballast Nedam.

Today, Rönesans constructs public and administrative buildings, school buildings, healthcare complexes, shopping centers, offices, hotels, residences, mixed-use buildings, roads, highways tunnels, railway tunnels, heavy industrial facilities, infrastructure projects, manufacturing facilities, chemical and pharmaceutical production facilities, food and beverage processing facilities, automotive and machinery factories, and power plants. Having started in business 27 years ago as a construction company, Rönesans is today a big global company operating in several different sectors.

Rönesans's competitive advantage is due to its high engineering capability, extensive experience, high-quality services, and outstanding solutions; which have made the company the preferred general contractor for many local and international investors.

Having been ranked the 23rd in ENR's 2020 list of world's largest construction companies and Europe's 9th largest construction company, Rönesans has successfully completed design, construction, financing, operation and maintenance of diverse types of projects. As a reliable and responsible contractor, some of its

competitive advantage, and experience which would be a boosting factor for the construction and operation of any prestigious Project.

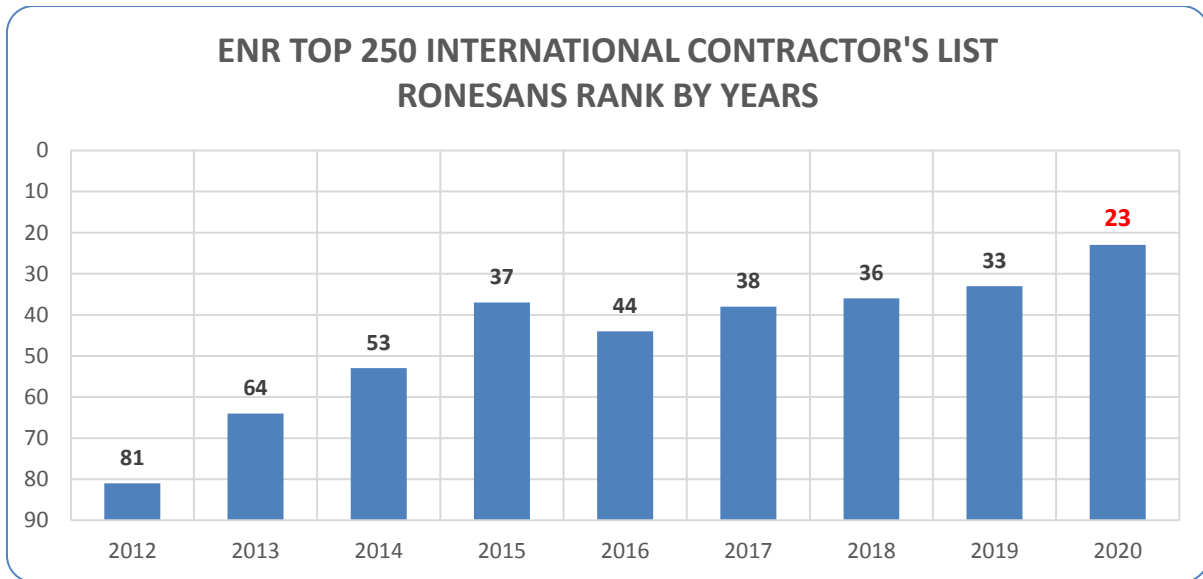


Figure 1.1: Rönesans Rank of ENR by Years

Holding's subsidiary companies are ISO 9001 certified assuring its partners and customers that the principles of management and execution of projects, from the very outset until completion, are observed at all times, resulting in creative and customer oriented solutions compliant with economical and functional objectives.

Established in St Petersburg, Russia in 1993 by Dr. Erman Ilıcak, Rönesans Holding (hereinafter Rönesans, Renaissance or Holding) is currently operating in the roles of as main contractor and investor in 28 countries around the globe. The Holding is engaged in the main fields of building/infrastructure construction, industrial construction, real estate development, concessions (PPP, BOT, DBFMO). The segments are represented by divisions which operate in Russia, Turkey, Netherlands, Algeria, Austria, Turkmenistan, Kazakhstan, Iraq, Qatar, Azerbaijan, Switzerland. Rönesans continues to diversify its portfolio by expanding its activities into new segments and exploring new markets.

Founded in 1993 as Rönesans Construction St. Petersburg, Rönesans has initiated its operations via building and infrastructure projects. In 2001, Rönesans has started to invest in the field of property development and in 2006 it has established a new enterprise called Rönesans Real Estate Investment with the aim of gathering all property development investments under a single roof. With the establishment of Rönesans Energy in 2007, Rönesans has started to invest in renewable energy projects. In 2011, the Group made the strategic decision to establish an industrial division – Rönesans Heavy Industries. With the establishment of Rönesans Health Investment in 2013, Rönesans has started to invest in the field of health facilities.

Main Lines of Business

Rönesans Holding operates activities in many fields of construction and concession.

Rönesans Construction: Rönesans Construction was founded in St. Petersburg in 1993. Rönesans Construction specializes in design and construction of shopping centers, offices, hotels, multifunctional complexes, high-rise buildings, heavy industrial facilities, infrastructure, energy facilities, pharmaceutical plants, food and beverage processing plants, public buildings and residential buildings. Both in Turkey and Russia, Rönesans Construction has completed various administrative building projects.

Rönesans Heavy Industries: Rönesans Heavy Industries was founded in 2011, with the strategic decision to enter industrial projects market. The company was awarded projects in all leading sectors: hydrocarbons,

power, metallurgy and mining, as well as processing plants, in all our core markets –Russia, Turkmenistan and Iraq– as well as in Mozambique.

Rönesans MEA: Rönesans MEA has established to focus on construction of residential buildings, infrastructure projects, commercial real estates, public buildings, hotels in Nigeria, Qatar and Libya as well as in the East and West Africa Region.

Rönesans Medical Construction: Rönesans Medical Construction has established as a EPC contractor in healthcare investments of Rönesans. Medical Construction focuses on construction of city hospitals, health campuses, physical treatment and rehabilitation hospitals in different cities of Turkey. Rönesans Medical Construction is the contractor specialized in healthcare projects in Turkey, reaching approximately 3.200.000 m² of construction area.

Rönesans Development (Desna): Rönesans Development (Desna), founded in 1999, is Rönesans's commercial real estate development platform in the Russian Federation. It specializes in developing land and plots in Moscow, St. Petersburg and other cities in the region, with office, business center, mixed-use and luxury residential projects, design, construction, financing and administration of shopping mall projects. Rönesans Development is one of the largest real estate firms in Russia.

Rönesans Real Estate Investment: Rönesans Real Estate Investment (RGY), founded in 2001, is Rönesans' commercial real estate development and investment arm in Turkey. RGY is the leading shopping center developer in Turkey with 700 k sqm of leased space in partnership with GIC. RGY developed Turkey's first business tower with a LEED Platinum High-Rise Building Certificate, in Ataşehir, Istanbul. RGY's portfolio includes nine shopping malls, one hotel, two office projects and school projects in various Turkish cities.

Rönesans Healthcare Investment: Rönesans Healthcare Investment (RSY) performs the investment activities of Rönesans in the healthcare industry. The projects, which RSY manages the 28 year concession period, have rapidly reached a total construction area of 3,200,000 m² and a total bed capacity of 9,500. Rönesans Healthcare Investment is the market leader in Turkey's PPP (Public Private Partnership) healthcare investment pipeline by 32%.

Rönesans Facility Management & Consulting: Established as a subsidiary company of Rönesans Healthcare Investment in 2014, Rönesans Facility Management & Consulting operates as a service provider in its healthcare investments for a duration of 25 years.

Rönesans Energy: Rönesans Energy is established in 2007, with the aim to explore the investment opportunities in the rapidly growing Turkish energy market. Rönesans Energy, with a highly experienced staff in the energy sector, decided to carry out its initial activities by primarily investing in the field of renewable energy production and especially constructing hydroelectric power plants (HEPP). Rönesans Energy owns and operates a well-diversified hydro-electric power plants portfolio comprises of six operational plants with a total installed capacity of 165 MW.

Rönesans was awarded Mersin Adana Osmaniye Gaziantep High Speed Railway Construction by Turkish State Railways. Some parts of the railway construction work between Mersin and Gaziantep have been performed by former constructors. Therefore, Rönesans will work for the incomplete parts of the high-speed railway to provide continuous and fast transportation between Mersin and Gaziantep Provinces.

Rehabilitation of the existing railway lines, construction of two new lines, Electrification, Signaling and Telecommunication (EST) infrastructure, and connection of the line to the Çukurova Airport and Tarsus will be performed by Rönesans. In other words, Rönesans will finish off the incomplete works for the Mersin - Gaziantep High Speed Railway.

Within the scope of the Project, new railway lines will be constructed, existing convectional lines will be rehabilitated (some parts will be displaced), structures such as stations, viaducts/bridges, tunnels, underpasses, overpasses, culverts will be constructed, and EST system of the whole lines will be installed. Moreover, open mine operation will be carried out for material supply.

1.6.2 Assystem ENVY

As an independent engineering group, Assystem has over 50 years of experience providing industrial infrastructures with engineering services and managing projects that are complex in size, technological content, and safety requirements.

Assystem ENVY, which is an 100% subsidiary of the Assystem Group company, is one of the leading consultancy and engineering firms in Turkey. Assystem Envy performed engineering and consultancy services for power generation projects, designed natural gas / crude oil pipeline and completed Environmental and Social Impact Assessment (ESIA) studies for some of the most important infrastructure projects in the region.

Assystem, as a key player in the industry for more than 50 years, the Group has highly-skilled teams of engineers who design and work on critical and complex infrastructure projects, as well as on building and ensuring the optimal use of assets throughout their life cycles. Moreover, Assystem is a group of companies providing consultancy and engineering services and employing more than 5,700 employees internationally in Europe (France, Russia, Germany, United Kingdom, Belgium, Switzerland, Romania, Spain), the Middle-East (Turkey, Saudi Arabia, United Arabs Emirates), India, Canada and the United States of America. Its more than 5,700 employees contribute their specific talent, know-how and values to help clients meet the range of challenges they face on a daily basis.

AEOS offers following services for projects:

- Project Management & Engineering
- PMO (costing, scheduling, contract, resources)
- Global Risk Management (GRM)
- Configuration management
- Contract management
- Construction supervision
- Test & commissioning
- Siting & permitting (ESIA...)
- PMC and SCM*
- Design of information and systems (BIM)

Digital & performance

- Instrumentation and control systems (V&V, MOC...)
- Industrial supervision (SCADA...)
- Building Management System (BMS) & Hypervision
- Specification, validation and maintenance of control systems
- System engineering
- Platform & data architecture
- Digital twin
- BIM
- PLM
- Predictive maintenance

Security & safety

- Integration, configuration, installation of cyber and physical protection systems
- Industrial cybersecurity
- Security / Site protection
- Functional safety
- Dependability

Assystem Envy Enerji ve Çevre Yatırımları A.Ş.

Assystem ENVY, which is an Assystem Group company, being Turkey's one of the leading consultancy and engineering firms, has performed engineering and consultancy services for power generation projects, designed natural gas / crude oil pipeline and prepared ESIA reports via involving the most important projects in the region such as Sinop Nuclear Power Plant, TANAP, Nabucco Pipeline, Akkuyu Nuclear Power Plant and etc.

Assystem ENVY is committed to assign all its experience and competences to achieve the project completion within specified periods according to work orders. To guarantee the success of the project, our strategy is based on 5 main topics:

- An experienced project management team: In Environmental and Social Impact Assessment aspects: from both energy and infrastructure vendors at all stages,
- Our site EIA/ESIA references in Turkey (projects conducted in over 50 cities),
- A strong supply chain with specific & complementary technical firms, with whom we already had or currently have experience with,
- A clear communication plan, with the establishment of a Steering Committee to oversight and control the project progress,
- A multi-disciplinary 'Pool of Experts' from for ESIA Projects such as environmental engineers, ecologists, sociologists, geological engineers and etc.

Capabilities

The strategy to become a solution partner for clients is provided by integrated engineering and project management services. Keeping this advantage and ability to integrate national/worldwide reputable consultants, Assystem ENVY is providing top-notch engineering, consultancy and project management services, environmental, social and technical consultancy and can act as a lender's engineer and owner's engineer in many sectors. Assystem ENVY has proved its own engineering services, including many disciplines, in a large number of national and International prestigious projects both in energy and environmental market.

Not only does Assystem Envoy perfectly correspond to the needs of the Project, it also fully understands the challenges of safe, economic, long-term ventures. This approach is driven by profound experience in projects and proven by top performance over the last decades in environmental and social impact assessment studies. In this setup, the services provided are unique to the market. In the context of the Project, the benefits can be read as follows:

- Direct link into a European-based company,
- Proven performance in delivering, engineering and environmental and social impact assessment projects on an international level by Assystem Envoy,
- Delivery of a tailor-made solution for Project in a robust delivery model (on-site, front-office, back-office),
- Complementary competences in engineering and national/international legislations for ESIA projects,
- Cooperation with the Client is one of the key components to successfully complete a project not only from a technical point of view but also to reach critical deadlines and if necessary to help develop the local workforce for a more sustainable future,
- Strong local footprint and commitment in the Turkey.

In general, Assystem ENVY is highly committed for a sustainable partnership. The customized services are value-based and quality-driven; the delivery model is proven and robust. The combination of engineering and regulatory expertise, engineering know-how and pragmatic knowledge offers the client not only a unique, complete and integrated approach but also a multicultural, experienced and motivated team.

Assystem ENVY has been involved the most important regional environmental consultancy services and has given us a deep understanding of the activities required in Client's programs. This allows us to proactive management the administrative areas of the engagement of technical experts and external support.

Being agile is a core strength of Assystem ENVY have numerous examples of where reacted quickly but diligently to opportunities. Its agility comes down to a number of key components:

- Assystem ENVY have staff based in our Ankara Office – Client will know where to find us which is important,
- In Ankara office, more than 40 employees are currently working full time and enrolled in its payroll. Background of the employees varies from environmental engineering, geological and geophysical engineering, biology, sociology and more. Also Assystem ENVY is working very closely with the most competent experts from universities and other related institutions.
- Assystem ENVY would adopt processes that Assystem ENVY uses for other clients that are text light so that critical scoping and delivery information can be quickly articulated and understood,
- Assystem ENVY has a proven local/global mobility function that allows us to mobilize staff internationally in short periods of time,
- Its internal resourcing, and commercial governance processes are tailored to be very light for such frameworks to enable efficiency project delivery,

Assystem ENVY makes evaluation of the environmental, social and health impacts arising from the projects planned to be conducted in the scope of carried out works by considering economic and social developments, environmental values and social and health structure and provides services encompassing the measures to be taken to avoid, remedy and/or minimize both direct and cumulative impacts. In the course of these works, Assystem ENVY adheres to the local and international regulations, standards and guidelines to meet the requirements of its Clients, competent authorities and lenders/IFIs by following the procedures during the entire work phase. Categorization, seasonal environmental baseline studies, assessment of beneficial and adverse environmental and social impacts of the proposed project(s) by considering IFI Standards, preparation of management plans providing concrete mitigation measures for a sustainable environment are the basic steps for this purpose. Assystem Envoy provides independent consultancy services, and monitoring and auditing services for the lenders/IFIs and local authorities.

Over the past 20 years, the Company has been involved in the realization of more than 30,000 MWe of power-generation projects, designed more than 36,000 km of natural gas pipelines and completed EIA and ESIA studies of the most important projects in the region. Addition to these, Environmental and Social Due Diligence studies, environmental and social baseline studies and monitoring activities have been performed by the Company. Some selected references of the company are listed in the Table 1.2.

Table 1.2: Some Selected References of the Assystem Envoy

No	Name of Project	Period	Client	Funded
1	Environmental Third Party Monitoring Works for TANAP Pipeline Project ESIA Studies	2018-ongoing	TANAP Natural Gas Transmission Company	IFC, EBRD
2	Akkuyu Nuclear Power Plant Monitoring Works	2017-ongoing	Akkuyu Nükleer A.Ş.	-
3	Independent Environmental and Social Consultancy Services for Phosphate Mine Sites, Phosphate Concentrator Facilities and Integrated Fertilizer Facility Project	2015-ongoing	Eti Bakır Co. (Cengiz Holding)	ING Bank N.V. in joined capacity with Eksport Kredit Fonden and Finnvera plc and Facility lenders Bayerische Landesbank and ING Bank, a branch of ING-Diba (Holland)
4	Karadağ Wind Farm (16.25 MWe) Environmental Due Diligence Studies	2015-ongoing	Okman Energy Generation Co.	DZ Bank AG (Germany)

No	Name of Project	Period	Client	Funded
5	Sinop Nuclear Power Plant Project (4 × 1100 MWe) EIA and ESIA Studies	2017-2020	EÜAŞ	-
6	SINOP Nuclear Power Plant Project (4 × 1100 MWe) Environmental Baseline Surveys	2014- 2016	ENGIE, Mitsubishi Heavy Industries, Itochu, Electricity Generation Company Inc. of Turkey (EÜAŞ)	-
7	Erzincan Tramway Line Project EIA Studies	2018-2020	Ministry of Transport and Infrastructure	
8	Çayırhan - B Coal Fired Power Plant (800 MWe / 1905 MWt) and Underground Coal Mining Project EIA & ESIA Studies	2017-2018	Electricity Generation Company (EÜAŞ)	
9	Socar Aliğa Cogeneration Plant Project EIA and ESIA Studies	2018-2019	Socar Turkey Energy Inc.	-
10	ADA Coal Fired Power Plant (1320 Mwe/3050 MWt), Jetty, Deep Sea Discharge and Ash Disposal Area EIA and ESIA Studies	2014-2016	ENGIE	
11	Thermal Power Plant (STEP-1, 672 MWe / 1589 MWt) Project and PETKOJEN New Steam Generation Plant (1199 MWt) Project ESIA Studies	2013 - 2015	SOCAR Power Energy Investments Inc.	EBRD & IFC
12	Hamitabat Natural Gas Combined Cycle Power Plant (1500 MWe / 2500 MWt) Project EIA and ESIA Studies	2013 - 2014	HEAŞ Energy Generation Company (LİMAK Holding)	UniCredit, Yapı Kredi, ING, KfW IPEX and DZ Bank)
13	Hanönü Copper Mining, Enrichment Facility and Paste Backfill Plant Project EIA and ESIA Studies	2012 - 2014	Asya Mining Inc. (İlbak Holding)	EBRD
14	Eriç Cascade Dams (No 4) and Hydroelectric Power Plants (282.53 MWe / 291.27 MWm), and 20 km Energy Transmission Line (154 kV) Project EIA and ESIA Studies	2011-2013	Eriç Energy Production Inc.	
15	NABUCCO Gas Pipeline Project (Sivas-Iraqi Border (Silopi) Part: 731 km) ESIA Studies	2010 - 2012	NABUCCO Gas pipeline International GMBH	EBRD, IFI and EIB

Assystem ENVY has been contracted with Rönesans as a consultant to perform the studies related to the ESIA process, which will involve the activities to be conducted by Rönesans.

The Project organization chart is given in Figure 1.2. As seen from the chart, two main subcontractors will contribute the Project as follows as well as flora, fauna and archaeology experts from universities:

- MACOM Environmental Energy and Technology Investments Ltd. Co (MACOM) will be responsible for visual impact assessment and air quality assessment studies, and
- FEBAS Environmental Laboratory Analysis Industry and Trade Ltd. Co. (FEBAS) will be responsible for the baseline measurements as an accredited laboratory by MoEU.

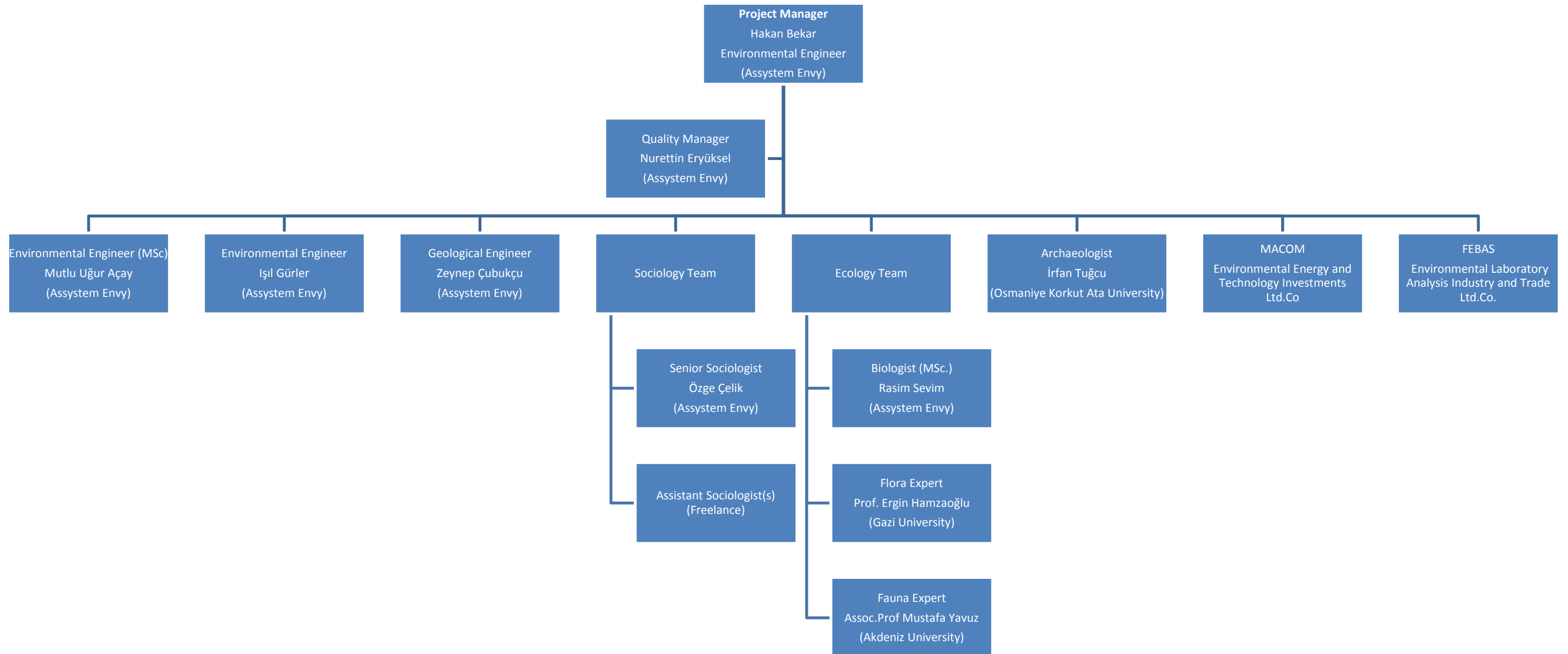


Figure 1.2: Organization Chart

2 PROJECT DESCRIPTION

2.1 Location

The location of the Project, which is 286 km in length, is presented in Figure 2.1. The Project starting from Mersin Province passes through Tarsus District, Adana (city center), Ceyhan District, Osmaniye (city center), Düziçi District, Bahçe District, Nurdağı District and ends at Gaziantep City.

The main route and related components such as quarries, campsites, etc., are presented in Attachment B.



Figure 2.1: Location of the Project

2.2 Project Activities

2.2.1 Pre-construction Phase

This phase entails mobilization of labor force and equipment, construction of offices/camps as well as acquisition of various permits as required by the laws. Quarries, which will be used for raw material supply and campsite locations are presented in map in Attachment B.

This phase also includes the following activities:

- Topographical Survey (completed),
- Geo-technical Investigation (completed),
- Soils and Materials Investigation (completed),
- Identification of borrow pits, quarry sites and sources of water (completed),
- Land acquisition (ongoing - is under responsibility of Ministry of Transportation and Infrastructure).

For the Project, land acquisition process is implemented by Ministry of Transportation and Infrastructure. It is declared by the Rönesans that, according to contract between Rönesans and the Ministry, The Ministry is responsible with the land acquisition process and any other permits which are related with land uses. As a result, Rönesans will not take any action for these issues.

2.2.2 Construction Phase

Mersin-Gaziantep Railway Project was developed by the Ministry of Transportation and Infrastructure in early 2010's. In present, many of permits has been taken and some construction activities have been completed and some of them are still continued by different companies.

A site reconnaissance survey had been performed between October 14 and 16, 2020 by Assystem ENVY to determine the status of the Project. Sample views from the survey are given in the following photographs.



Mersin Province



Mersin Province



Between Mersin and Taşkent



Taşkent Station-1



Before Taşkent Station



Between Taşkent and Tarsus



Entrance to Tarsus



Between Tarsus and Adana - 1



Between Tarsus and Adana - 2



Adana - 1



Adana - 2



Adana - 3



Between Adana and Ceyhan



Yılankaya Quarry



Ceyhan



Between Ceyhan and Toprakkale



Entrance to Osmaniye



Osmaniye Train Station



Between Osmaniye and Şekerdere



Between Şekerdere and Düziçi – 1



Between Şekerdere and Düziçi - 2



Between Düziçi and Bahçe



Entrance to Bahçe



Bahçe



Between Bahçe and Nurdağı



Entrance of Nurdağı



Başpınar Quarry



Exit of Tunnel-6



Ongoing Activities in Tunnel-6 Location



Filling Material Stock Area



Tunnel-5 Location



Exit of Tunnel-5

Figure 2.2: Photos from Reconnaissance Survey

As depending on the observation during the site survey, the construction works have been started before by other companies which were commissioned by TCDD. The Mersin-Gaziantep High Speed Railway Project was developed by TCDD and expropriation and construction activities were started about year 2015. Especially construction activities have been implemented by other companies due to their contracts between companies and TCDD. In early 2020, some activities couldn't be completed by that companies and as a result Rönesans was awarded to complete the Project by General Directorate of Infrastructure Investments. In present, many of permits have been taken and some construction activities have been completed and some of them are still continued by different companies. Responsibilities of other companies, which are not in scope of the Rönesans and this ESIA studies, are summarized in Table 2.1;

Table 2.1: Summary of Responsibilities of the Other Companies

Section	Mersin - Adana	Adana - Incirlik - Toprakkale	Toprakkale - Bahçe	Bahçe - Nurdağ Variant		Nurdağ - Başpınar	Başpınar - Gaziantep - M.Yavuz
Scope of the Work	Addition of 3 rd and 4 th lines between Adana and Mersin Stations	Addition of 2 nd line and rehabilitation of current line between Adana - Incirlik and Toprakkale Stations	Construction of Tunnel Works Between Toprakkale and Bahçe Stations	Infrastructure works of between Bahçe - Nurdağ Variant	Infrastructure, superstructure and electrification works between Bahçe and Nurdağ Variant	Construction of new lines between Nurdağ and Başpınar Stations	Infrastructure and superstructure works and reconstruct of railway lines between Başpınar – Gaziantep and Mustafa Yavuz Stations
Contractor	Dalgıçlar & Nuhoğlu	Çelikler	Demce & Bestaş	Intekar	Bestaş - Intekar	Fernas & Öztaş	Kolin & Gülermak & Kalyon
Distances	78.0 km	79.0 km	58.0 km		16.9 km	56.0 km	25.0 km
Percentage of the Completion	100.0%	22.0%	7.5%	100.0%		49.1%	100.0%

As seen from Table 2.1, many construction works and some other activities are responsibilities of other companies. Rönesans have been responsible to unexecuted works and to complete of the Project. According to these, activities to be carried out by Rönesans are listed below for each section of the route:

Mersin - Adana Section (76 km):

- Existing 2 convectional lines will be rehabilitated,
- The third and fourth high speed railway lines will be constructed,
- The river crossing bridge constructed of 20 steel structures will be removed and a concrete bridge will be built instead,
- Existing 46 culverts in the first and second line will be extended up to the third and fourth line,
- 12 stations will be built,
- EST systems of 4 lines will be installed,
- Incomplete infrastructures and superstructures on Çukurova Airport connection line, which is 9.5 km double line, will be built, EST systems will be installed and a viaduct 1,113 m in length will be constructed on the connection line.

Underpasses, overpasses and surrounding walls, which will be constructed by Turkish State Railways (TCDD) are not in the scope of this Project.

Adana –İncirlik–Ceyhan –Toprakkale Section (79 km)

- The first 49 km section of the 79 km double rail line will be constructed, infrastructures and superstructures will be built, and EST will be installed,
- Infrastructure and superstructure works of the last 30 kilometers of the line will be completed by another contractor, but electrification and signaling works of this part will be carried out,
- 3 hydraulic bridges, 12 overpasses, 8 underpasses, 54 culverts and 2 tunnels will be constructed,
- A viaduct will be built on a 4 km section due to the inability to fit into the existing line in İncirlik region,
- 5 stations on the railway line will be renovated.

Toprakkale–Osmaniye–Bahçe Section (58 km)

- 8 km double railway line will be constructed between Toprakkale–Osmaniye–Bahçe, all infrastructures and superstructures will be completed,
- 5 viaducts, 15 overpasses, 23 underpasses and 83 culverts will be built,
- Three stations will be constructed,

11 cut and cover tunnels (2,387 m), 5 tunnels (9,785 m), 9 single tube escape tunnels (3,687 m) and 7 cut and cover escape tunnels (449 m), which will be constructed by another contractor, are not in the scope of this Project.

Bahçe-Nurdağ Section (approx. 19 km)

- Only signalization works for the 19 km dual railway line will be carried out.

All other necessary works, which will be carried out by another contractor, are not in the scope of this Project.

Nurdağ–Başpınar Section (56 km)

- The final 16 km section of the 56 km dual rail line will be constructed. Infrastructures and superstructures of this line and EST systems will be built.
- Infrastructure and superstructure works of the first 40 km section will be carried out by another contractor. However, electrification and signaling works of this part will be carried out,

- 3 viaducts, 2 overpasses, 1 underpass, 8 culverts and 1 tunnel will be constructed,
- One station will be built.

2.2.3 Demobilization of Temporary Structures

This phase entails the demobilization of temporary structures will be done for proper restoration of the sites (e.g. removing/spreading topsoils piled along the railway, restoration of borrow pits to the required grades, removing all temporary structures etc). Other activities include;

- Demobilization of the workshops and stockpile yards;
- Demobilization of campsite at least to the original site condition;
- Clearance of all sorts of wastes including used oil, sewage, solid wastes (plastics, wood, metal, papers, etc.);
- Deposition all wastes to the authorized dumpsite and;
- Restoration of water ponds to a natural and useable condition, termination of temporary employment.

2.2.4 Operation Phase

Once the Project is completed, it will be transferred to TCDD and operated by this authority. TCDD is the General Directorate under Ministry of Transportation and Infrastructure. TCDD will be solely responsible to operate the high-speed railway.

2.2.5 Decommissioning Phase

Decommissioning phase is not anticipated in the near future.

2.3 Summary of Key Environmental Sensitivities

Mersin-Gaziantep Railway Project developed by Ministry of Transportation and Infrastructure and divided in sections. Therefore, two “EIA Positive” decisions from MoEU and three “EIA Is Not Required” decisions from the Provincial Directorates of Environment and Urbanization were secured.

Based on the information provided by the approved EIA and pre-EIA reports, the key environmental sensitivities are listed below:

- There is no protected area such as National Park, Wildlife Development Area, Nature Park, Nature Reserve Area, wetlands, etc. in and immediate vicinity of the route,
- Project passes through in Amanos Mountains Important Bird Area, Yeşilce Important Bird Area and Yılanlıkale Hills Key Biodiversity Area,
- Between Adana Province and Yüreğir District, 130 meters of the Project route passes through 1st and 3rd degree archaeological sites of Misis Ancient City. The construction permit was already taken from Adana Cultural and Natural Heritage Preservation Regional Board.
- At several points, the Project route intersects with water bodies,
- Project route crosses over agricultural and forest areas and passes through Mersin, Adana and Osmaniye Provinces and Tarsus and Ceyhan Districts.

Addition to these, general information about baseline conditions of the Project area are summarized in the Table 2.2 given below.

Table 2.2: General Information About Baseline Conditions

Topic	Overview of the Conditions
Climate	The climatic regime observed in and around the project area is Mediterranean Regime. This regime has hot and dry summers and wet and warm winters. Since the region is surrounded by high mountains (Toros Mountains), it constitutes a closed area for north winds and causes very hot summer. While the half of the precipitation is observed in winter, the rest is observed in spring and autumn.
Temperature	<p>According to long term recorded wind data via meteorological station in Adana, the annual average temperature is 19.0°C. The lowest temperature was observed in February and it was -3.5°C. The highest temperature was observed in June and it was 41.4°C.</p> <p>The temperature increases regularly through January to August, it decreases from September to December. July, August and September are recorded as the hottest months, beside December, January and February are the coldest ones. Notwithstanding, it is anticipated that the temperature regime will not be a constraint for the construction and operation of the power plant.</p>
Precipitation	According to long term recorded wind data via meteorological station in Adana, the annual average total precipitation value is 779.7 mm, while total average open surface evaporation is 1297.2 mm and the maximum precipitation is 210.8 mm which is observed in May. In addition, the minimum precipitation occurs in December with 46.0 mm. On the other hand, number of snowy days is almost zero (0.1 day) and average number of hailing days is only 1.8.
Wind	According to long term recorded wind data via meteorological station in Adana, the first prevailing winds are blowing from north (N) to south (S) direction, and the second prevailing winds are blowing from southwest (SW) to northeast (NE) direction. The land breeze which is dominant during autumn and winter is losing the own effect in summer after spring which can be accepted as a transition season. Then, the second prevailing winds which are from SW to NE are effective during whole summer.
Demographics	<p>As a candidate country of the European Union (EU), Turkey (TR) is included in the "Nomenclature of Territorial Units for Statistics" (NUTS) which is a geocode standard for referencing the subdivisions of countries for statistical purposes. The main aim of such a classification is to collect and analyse the data at certain regional levels, even though the administrative boundaries are subject to change with time, thus enabling to distribute the regional funds equally. The hierarchy of the three NUTS levels and the subdivisions do not necessarily correspond to administrative divisions within the country.</p> <p>According to this classification, there are 4 provinces. Mersin, Adana and Osmaniye provinces locate in within TR6 Mediterranean Region, Gaziantep Provinces locate in TRC Southeast Anatolia Region.</p> <p>In addition to this classification, below the NUTS levels there are two Local Administrative Unit (LAU). The first of these units (LAU-1) is districts and the second (LAU-2) is municipalities.</p> <p>In 2019, populations of Turkey, Mediterranean Region and Southeast Anatolia are 83,154,997, 10,627,530 and 8,975,618, respectively. The share of the populations of the Mediterranean Region (12.78%) and the Southeast Anatolia Region (10.79%) in the Turkish population is similar.</p> <p>When the populations of the provinces on the route are sorted from large to small, Adana Province (2,237,940 people) ranks first, Gaziantep Province (2,069,364 people) is second, Mersin Province (1,840,425 people) is third and Osmaniye Province (538,759 people) comes in fourth place.</p> <p>Seyhan District is the most populated settlement (796,286 people), while Bahçe District has the lowest population on the route (22,155 people).</p>

	<p>The total population of Şehitkamil District (794,931) comes second in the district's population ranking, but only 3.54% of this district's population is on the route.</p>
Socio-Economy	<p>The main indicators of employment are employment, labour force and unemployment. the unemployment rate in Adana-Mersin Sub-region (11.9%) is lower than in Turkey (13.7%). In the sub-regions (TR63 Sub-region and TRC1 Sub-region) where Osmaniye and Gaziantep provinces are located respectively, these rates are (18.1% and 15.2%) significantly higher than Turkey. This situation is related to the low number of employment and employment participation rates in the relevant regions.</p> <p>The economic activities are industry, tourism and agriculture in TR62 Adana-Mersin Sub-region. When the spatial distribution of economic activities in the region is examined.</p> <ul style="list-style-type: none"> • Agriculture, industry and tourism in Adana-Tarsus-Mersin metropolitan area; • Agriculture and industry in Adana's Kozan and Ceyhan districts; • Agriculture and tourism are concentrated in Erdemli, Silifke and Anamur districts of Mersin <p>The northern and western parts of the region show relatively underdeveloped features, and mostly agricultural and services sector activities stand out. Apart from the metropolitan center of the region consisting of Adana and Mersin centers and Tarsus district, the two districts that have sub-centers in the region are Ceyhan and Silifke. Osmaniye is suitable for agricultural production, animal husbandry and forestry with its geographical location and natural structure, but economic mobility is observed in many industrial sectors in the province with the influence of expanding industries in the surrounding provinces and the expansion of incentive measures in the recent period.</p> <p>As Osmaniye province became one of the priority provinces in development, investments were made in various sectors with the incentives given. At the beginning of these investments is the iron and steel sector.</p> <p>According to the "socio-economic development ranking survey of Provinces and Regions" announced by the State Planning Organization in May 2011, the Gaziantep Province ranks 30. among 81 provinces.</p> <p>Gaziantep has been under the influence of many surrounding provinces in economic terms, and has made serious investments in tourism in recent years. It is one of the provinces leading the Turkish economy with its production and export volume.</p>
Seismicity	<p>Turkey is divided into five subclasses of seismic zone with peak ground acceleration (PGA=amax) values of >0.4 g, 0.3 - 0.4 g, 0.2 - 0.3 g, 0.1 - 0.2 g and <0.1 g for zones ranging from I to V, respectively in accordance with seismic hazard zonation map approved by the Government of Turkey. For the project route, the Project is located in all seismic zones.</p> <p>Therefore, earthquake hazard and risk analysis will be studied in detailed in a different study prior to the construction activities based on those facts.</p>
Geology	<p>Southeast Mediterranean region involving the area affected by the recent earthquake consists of three main basins in Tertiary age which are separated by two main tectonic zones striking in NE-SW. In these basins basement rocks of Pre-Miocene age are different and belong to different tectonic zones. These are namely İskenderun Miocene Basin (Amanos Mountains and the Vicinity of İskenderun Bay), Adana Miocene Basin (South part of the East Taurus Belt), and Misis-Andırın Tertiary Basin which is located between these two basins. the generalized stratigraphical columns of the geologic units in the Adana and Misis-Andırın Basins where the recent earthquake was severely felt, and in the vicinity of Osmaniye, respectively.</p> <p>Çukurova Basin is extensively covered by alluvial deposits of Quaternary period. The rock units of the Çukurova Basin belong to Upper Cretaceous, Oligo-Miocene, Pliocene</p>

	<p>and Quaternary, and andesite and travertines. Rock units of Upper Cretaceous are found in the south-east of the basin, namely, in Harami, Cebelinur and Dede Mountains. Rock units show volcanosedimentary stratigraphy and consist of tuff, sandstone, marl and agglomerates. The ridge of these mountains is in the direction of NE-SW.</p> <p>Conglomerate and sandstone of Miocene age crop out in the south of the basin and they are called as Güvençli formation. Sandstone, siltstone, marl and mudstone of Pliocene age is known as Handere formation and they are observed in the north-west of the basin.</p>
Access to the Project Site	<p>The Project starting from Mersin Province passes through Tarsus District, Adana (city center), Ceyhan District, Osmaniye (city center), Düziçi District, Bahçe District, Nurdağı District and ends at Gaziantep City. The route generally goes through O52 highway and D400 state roads. In current situation, there is no any problem to access to the Project site.</p>
Flora and Fauna	<p>The Project passes through generally city centers and agricultural areas in four provincial borders which are Mersin, Adana, Osmaniye, Gaziantep. The settlements that the Project passes through are Mersin, Tarsus, Adana, Ceyhan, Toprakkale, Osmaniye, Düziçi and Nurdağı. On the Project area, anthropogenic effect is dominant and generally cultivated plant and animal species which has high spreading ability can be seen. <i>Prosopis farcta</i> (Çediotu) and <i>Conyza bonariensis</i> (Pyrethrum), which are frequently observed on the sides of the railway and highway, are the most characteristic ones. The first natural area that stands out in these parts is Yılkale. Yılkale has a rocky appearance in general. The area, whose northern parts are sparse oak groves, is under protection due to its historical importance. <i>Quercus coccifera</i> (Kermes oak), <i>Paliurus spina-christi</i> (Blackthorn) and <i>Rhamnus</i> sp. (Buckwheat) species are the most outstanding plants of this area. <i>Pinus brutia</i> (Red Pine) and in some places <i>Quercus</i> sp. (Oak) communities are dominant on Nurdağı is a mountain which is between Bahçe (Osmaniye) and Nurdağı (Gaziantep) districts. Since the line will pass through a 17 km tunnel in this section, the anthropogenic effect on natural vegetation will be at the lowest level. The last natural area on the line is Sof Mountain, which is partially between Gaziantep (Nurdağı, Şehitkamil) and Kahramanmaraş (Pazarcık). Sof Mountain is generally a rocky area. Shrubs and small oak communities, which are frequently occupied by agricultural lands, are the most characteristic plant communities of the mountain. <i>Quercus coccifera</i> (Kermes oak), <i>Q. brantii</i> (Black oak), <i>Rhamnus</i> sp. (Cehri) and <i>Crataegus</i> sp. (Hawthorn) species are the most characteristic species of Sof Mountain.</p> <p>In the settlements and agricultural areas along the line, no endemic plant species that need to be protected were found at the site surveys which were held in autumn and winter by Assytem Envy ecology team. The line does not pass directly from Yılkale, which is a Key Biodiversity Area, and there is Ceyhan river in between Project route and Yılkale Key Biodiversity Area. In addition, the area is already under protection. The endemic species, which are likely to be in the area, are unlikely to be damaged by this activity. The endemic species, which are likely to be in the area, are unlikely to be damaged by the Project. In Nurdağı and Sof Mountain which are other natural areas, the line passes through the tunnel and no endemic plant species that should be protected have been found on the tunnel entrances and exits affected by the activity and the secondary roads to reach these areas.</p>
Noise	<p>Residential properties and industrial districts exist in the vicinity of the route of the Project and will be sensitive to noise effects during construction and operation phases. The major noise source at the site and in the surrounding area is traffic-induced noise. There is potential for noise impacts as a result of the Project. A baseline noise survey will be undertaken to establish existing background and ambient noise levels at representative sensitive receptors. The assessment will consider noise levels for both the construction and operational phases.</p>

3 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 National Legislation

In Turkey, there are numerous directives and laws, which are oriented towards prevention of environmental pollution and protection of human health and natural resources and arranging social life in a clean environment with a peaceful and confident way.

The legal arrangements ensure the preservation of environmental quality by preventing environmental pollution. The purpose of legal arrangements in environmental area is to determine necessary standards and behavioral patterns of authorized agencies and citizens in order to live in a healthy and a balanced environment. Directives, circulars, notifications that have been issued based on the laws include the details related to procedures and methods to be complied with.

Turkish legislation on the environmental protection largely overlaps with the European Union (EU) legislation in line with the harmonization studies carried out in the scope of pre-accession efforts of Turkey to the EU. The majority part of the national environmental legislation related to the Project is presented below under the headings of general, nature protection, soil quality, climate change, air quality, water quality, waste management, management of chemicals, and noise.

General

- Environmental Impact Assessment Regulation (Official Gazette dated 25.11.2014 and numbered 29186),
- Environmental Letter and License Regulation (Official Gazette dated 10.09.2014 and numbered 29115),
- Regulation on Environmental Audit (Official Gazette dated 21.11.2008 and numbered 27061),
- Law on Measures to be taken and Aids to be provided for the Disasters Effective in Public Life (dated 15.5.1959 and numbered 7269).

Nature Protection

- Regulation on the Procedures and Principles Regarding the Protection of Game and Wild Animals and Their Lives; Pest Control (Official Gazette dated 24.10.2005 and numbered 25976),
- Regulation on the Conservation of Wetlands (Official Gazette dated 04.04.2014 and numbered 28962),
- Regulation on Pasture (Official Gazette dated 31.07.1998 and numbered 23419),
- Land Hunting Law No. 4915 (Official Gazette dated 11.07.2003 and numbered 25165),
- National Parks Law No. 2873 (Official Gazette dated 11.08.1983 and numbered 18132),
- Environment Law No. 2872 (Official Gazette dated 11.08.1983 and numbered 18132) and all relevant Regulations,
- Law No. 2863 on Conservation of Cultural and Natural Entities (Official Gazette dated 23.07.1983 and numbered 18113),
- Red Data Book for Turkish Bird Species (Kiziroglu, 2008),
- Central Game Commission (MAK) Decisions of Turkey.

Soil Quality

- Regulation on Control of Soil Contamination and Point Source Contaminated Lands (Official Gazette dated 08.06.2010 and numbered 27605).

Climate Change

- Regulation on Minimization of Ozone Depleting Substances (Official Gazette dated 07.04.2017 and numbered 30031),

- Regulation on Monitoring of Green House Gas Emissions (Official Gazette dated 25.04.2012 and numbered 28274).

Air Quality

- Regulation on Control of Air Pollution from Industrial Sources (Official Gazette dated 03.07.2009 and numbered 27277),
- Regulation on Exhaust Gas Emission Control (Official Gazette dated 11.03.2017 and numbered 30004),,
- Regulation on Control of Emissions forming Odour (Official Gazette dated 19.07.2013 and numbered 28712)
- Regulation on Air Quality Assessment and Management (Official Gazette dated 06.06.2008 and numbered 26898).

Water Quality

- Regulation on Urban Wastewater Treatment (Official Gazette dated 08.01.2006 and numbered 26047),
- Regulation on Control of Pollution Caused by Hazardous Substances in the Aquatic Environment and Its Surroundings (Official Gazette dated 26.11.2005 and numbered 26005),
- Regulation Concerning Water Intended for Human Consumption (Official Gazette dated 17.02.2005 and numbered 25730),
- Water Pollution Control Regulation (Official Gazette dated 31.12.2004 and numbered 25687),
- Regulation on Fishery Products (Official Gazette dated 10.03.1995 and numbered 22223),
- Regulation on Protection of Groundwater Against Pollution and Deterioration (Official Gazette dated 07.04.2012 and numbered 28257),
- Monitoring of Surface and Groundwater Regulation (Official Gazette dated 11.02.2014 and numbered 28910).

Waste Management

- Regulation on the Control of Packaging Waste (Official Gazette dated 27.12.2017 and numbered 30283),
- Regulation on Waste Management (Official Gazette dated 02.04.2015 and numbered 29314),
- Regulation on the Control of Waste Tires (Official Gazette dated 25.11.2006 and numbered 26357),
- Regulation on Control of Medical Wastes (Official Gazette dated 25.01.2017 and numbered 29959),
- Regulation on Control of Waste Batteries and Accumulators (Official Gazette dated 31.08.2004 and numbered 25569),
- Regulation on Waste Oil Control (Official Gazette dated 21.12.2019 and numbered 30985),
- Regulation on Control of Waste Vegetable Oil (Official Gazette dated 06.06.2015 and numbered 29378),
- Regulation on Control of Excavated Soil, Construction and Demolition Wastes (Official Gazette dated 18.03.2004 and numbered 25406),
- Regulation on Receiving of Wastes from the Vessels and Control of Wastes (Official Gazette dated 26.12.2004 and numbered 25682),
- Regulation on Amendment of Regulation on Receiving of Wastes from the Vessels and Control of Wastes (Official Gazette dated 18.03.2010 and numbered 27525),
- Regulation on Control of Waste Electrical and Electronic Appliances (Official Gazette dated 22.05.2012 and numbered 28300),

- Notice on Fuel, Auxiliary Fuel and Alternative Raw Material Derived from Waste (Official Gazette dated 20.06.2014 and numbered 29036).

Management of Chemicals

- Regulation on Safety Information Forms on Hazardous Substances and Mixtures (Official Gazette dated 13.12.2014 and numbered 29204).

Noise

- Regulation on Assessment and Management of Environmental Noise (Official Gazette dated 04.06.2010 and numbered 27601),
- Regulation on Control of Ambient Noise Emissions Originating from Equipment used Outdoor (Official Gazette dated 30.12.2006 and numbered 26392).

Furthermore, the requirements of the applicable national legislation related to workers' health and safety shall be fulfilled to provide suitable working environment and to minimize the impact and risks on employees both during the construction and operation phases of the project. In this sense, several acts and regulations that should be considered are listed below.

- Labor Law No. 4857 (Official Gazette dated 10/6/2003 and numbered 25134),
- Occupational Health and Safety Law No. 6331 (Official Gazette dated 30.6.2012 and numbered 28339),
- Regulation on Health and Safety Requirements for Temporary or Fixed Term Works (Official Gazette dated 23.08.2013 and numbered 28744),
- Charter on the Measures To Be Taken At the Works and Businesses Which Utilize Flammable, Explosive, Hazardous and Detrimental Materials (Official Gazette dated 24.12.1973 and numbered 14752),
- Regulation on Transportation of Explosives via Highways (Official Gazette dated 24.04.2019 and numbered 30754),
- Regulation on Personal Protective Equipment (Official Gazette dated 01.05.2019 and numbered 30761),
- Regulation on Usage of Personal Protective Equipment in Workplaces (Official Gazette dated 02.07.2013 and numbered 28695),
- Mining Law No. 3213 (Official Gazette dated 15.06.1985 and numbered 18785),
- Act on the Procedures and Principles on Manufacture, Import, Transportation, Storing, Sales, Usage, Disposal and Control of Explosive Materials, Hunting Equipment and Similar Exempted from Monopoly (Official Gazette dated 29.09.1987 and numbered 19589).

3.2 International Conventions and Treaties

The international conventions, related to the Project, to which Turkey is a party to, are listed below.

- Stockholm Convention on Persistent Organic Pollutants, 2001 (Turkey 2001),
- European Landscape Convention, Florence 2000 (Turkey 2003);
- Convention on Biological Diversity, Rio de Janeiro 1992 (Turkey 1996);
- United Nations Framework Convention on Climate Change, 1992 (Turkey 2004);
- Kyoto Protocol to the United Nations Framework Convention on Climate Change, 1992 (Turkey 2009);
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987 (Turkey 1990);
- Vienna Convention for the Protection of the Ozone Layer, 1985 (Turkey 1990);

- International Union for Conservation of Nature,
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES Convention, Turkey 2001);
- Convention on the Conservation of European Wildlife and Natural Habitats, Bern 1979 (Turkey 1984);
- Convention concerning the Protection of the World Cultural and Natural Heritage, Paris 1972 (Turkey 1983);
- International Convention for the Protection of Birds, Paris 1959 (Turkey 1966);
- 1983 Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) and Agreement (bird and mammals and their habitats, 1994);
- 1971 International Convention on Wetlands of International Importance especially as Waterfowl Habitat (RAMSAR Convention) and the as amended by 1982 Protocol;
- 1951 International Plant Protection Convention;
- 1950 International Convention for the Protection of Birds;
- 1979 Convention on Long-range Transboundary Air Pollution and its protocols;
- 1998 Aarhus Convention on the Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters;

3.3 International Standards

Among the potential creditor corporations for the Project, the social and environmental standards and guiding documents of International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD) shall be taken as basis for every phase of the Project. All these standards serve for the improvement of the project's performance through its evaluation in environmental and social aspect by minimizing of negative impacts and increasing in contributions.

The processes of ESIA adopted by finance foundations, which are basically conformable with the EIA methodology, are explained in the following paragraphs.

IFC Performance Standards

As the financial department of the World Bank, IFC, has constituted its environmental and social policy with the intention to provide the implementation of the projects that it provides finance in line with the sustainability principle and in that regard, has established performance standards (PS) as the basis of environmental and social evaluation. The IFC performance standards (PSs) are given brief as follows.

PS 1: Social and Environmental Assessment and Management System; it underscores the importance of managing environmental and social performance throughout the life of a project.

PS 2: Labor and Working Conditions; it comprises the issues on the protection of basic worker rights under the headings of Working Conditions and Management of Worker Relationship, Protecting the Workforce, Occupational Health and Safety, Non-Employee Workers.

PS 3: Pollution Prevention and Abatement; it outlines a project approach to pollution prevention and abatement.

PS 4: Community Health, Safety and Security; it covers the assessment of the potential risks and impacts to the health and safety of the affected community from project activities.

PS 5: Land Acquisition and Involuntary Resettlement; it highlights that in addition to physical displacement, economical displacement (loss of income, etc.) should be considered during the land allocation for the project.

PS 6: Biodiversity Conservation and Sustainable Natural Resource Management; it recognizes the protection and conservation of biodiversity - the variety of life in all its forms - and its ability to change and evolve and that this is fundamental to sustainable development.

IFC Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. The requirements set out in this Performance Standard have been guided by the Convention on Biological Diversity, which defines biodiversity as “the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species, and of ecosystems. The objectives of the Standard 6 are:

- To protect and conserve biodiversity.
- To maintain the benefits from ecosystem services.
- To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities

PS 7: Indigenous Peoples; it includes the assessments of the indigenous peoples among the social groups at the project area.

PS 8: Cultural Heritage; it includes the protection of the cultural heritage in the project design and implementation and the usage of the cultural heritage by the project.

General Environment, Health and Safety (EHS) Guidelines of IFC is among the guiding documents to be based on during implementation. It contains information on environmental issues, occupational health and safety, community health and safety. The important aspects for the construction and decommissioning phases are given in a separate section in this guide. Furthermore, Industry Specific EHS Guidelines defines the environmental impacts and health and safety risks about the sector to which the project is related to and also it leads the way for the measures to be taken.

EBRD Environmental and Social Standards

The EBRD aims for the projects to be financed that the projects to be socially and environmentally sustainable in compliance with applicable regulatory requirements and good international practice, and to think the rights of workers and communities subject of the Project. Through the Performance Requirements (PR) adopted in line with these objectives, the Bank defines the key areas of environmental and social impacts and issues and requires monitoring the applications. Bank's performance requirements are basically parallel to the IFC's performance standards and listed below.

PR 1: Environmental and Social Appraisal and Management

PR 2: Labor and Working Conditions

PR 3: Pollution Prevention and Abatement

PR 4: Community Health, Safety and Security

PR 5: Land Acquisition, Involuntary Resettlement and Economic Displacement

PR 6: Biodiversity Conservation and Sustainable Natural Resource Management

PR 7: Indigenous Peoples

PR 8: Cultural Heritage

PR 9: Financial Intermediaries

PR 10: Information Disclosure and Stakeholder Engagement

PRs 1 through 8 coincide entirely with the eight performance standards of IFC. As for PR 9, it requires the Bank to evaluate the environmental and social policy and practices of the intermediaries in case if the project is financed by the intermediaries. PR 10 points out the requirements regarding determination of the potential stakeholders of the project, information disclosure and collection of comments via convenient tools.

Bank assesses the benefit making of the project and particularly notices its socio-economic contributions. Moreover, climate change, biodiversity, stakeholder engagement and information disclosure are emphasized.

Equator Principles

Equator Principles are sets of principles defined by the International Finance Corporation and used with the aim of the evaluation of the projects whether they have certain environmental and social standards in the process of the project finance. The Equator Principles Financial Institutions (EPFIs) are the institutions decided to carry out the project finance transactions in compliance to Equator Principles and they stipulate that the activities should be performed in complaint to these principles in the projects to which they finance. These principles are briefly explained below.

EP 1: Review and Categorization; Following the assessment of the project in terms of its social and environmental impacts, it categorizes the project as per the magnitude of impacts as A (projects with significant impacts), B (Projects with limited impacts that are few in number and reversible) or C (Projects with minimal or no impacts).

EP 2: Social and Environmental Assessment; it establishes the issues to be taken as basis in the social and environmental assessment of each project assessed as being either Category A or Category B depending on the nature and scale of the proposed project.

EP 3: Applicable Social and Environmental Standards; it states that the environmental and social assessment should refer to IFC Performance Standards and also Industry Specific EHS Guidelines.

EP 4: Action Plan and Management System; it signifies the necessity of preparing an action plan defining the procedures to be followed and measures to be taken to minimize the adverse impacts on the communities at the project site and its immediate neighborhood, to compensate their loss and to be beneficial.

EP 5: Consultation and Disclosure; it establishes the necessity of information disclosure to the project affected communities, consultation and management of these activities in a structured manner.

EP 6: Grievance Mechanism; it requires the establishment and functioning of a grievance mechanism as part of the management system to ensure that consultation, disclosure and community engagement continues throughout construction and operation of the project.

EP 7: Independent Review; it requires that an independent expert, not directly associated with the project owner, shall review the social and environmental assessment, action plan and consultation process documentation in order to assess Equator Principles compliance.

EP 8: Covenants; it states that it is requisite for the project owner to comply with host country laws and regulations and acquire required permits, to comply with the action plan and to provide periodic reports so as to fulfill his social and environmental covenants.

EP 9: Independent Monitoring and Reporting; it highlights that the monitoring and reporting process should be carried out by an independent environmental and/or social expert.

EP 10: EPFI Reporting; it utters about the obligation of each EPFI adopting the Equator Principles to report publicly at least annually about its Equator Principles implementation processes and experience.

4 ESIA METHODOLOGY

4.1 ESIA Process

ESIA is a systematic process, which serves to identify, predict and evaluate the potential impacts of proposed projects on environmental and social receptors, and control the effects of the project impacts on these receptors. The purpose of ESIA is to:

- provide information for decision-making on the environmental and social issues due to proposed projects; and
- promote environmentally sound and sustainable development through the identification of appropriate enhancement and mitigation measures.

In line with these objectives, the ultimate concern of the Project is to be able to manage environmental and social risks to be arisen by any project activity through controlling potential for environmental and social damage and liability, which can lead to costly and time consuming litigation. For this reason, the focal point of ESIA process is to manage risks in a pro-active manner to be able to control adverse impacts on the environmental and social receptors in the project-affected area and also grasp opportunities for environmental and socio-economic development.

Risks and impacts likely to emerge as a result of the project will be analyzed as depending on the Rönesans' responsibility and according to the areas (zone) of influence, which can considerably vary in terms of environmental and social aspects.

In addition, an Environmental and Social Management System and Environmental and Social Action Plan (ESAP) will be developed including the framework plans and procedures in the scope of the ESIA Report.

Furthermore, following studies will be conducted within the context of the ESIA Report:

- Detailed social and environmental impact assessment,
- Baseline environmental studies,
- Visual impact assessment.

A grievance mechanism procedure will also be explained in order to forward any complaints, which public may be faced, to competent person/authority, promptly and transparently.

4.2 Categorization of the Project

The scope of the project is overviewed and the categorization of the Project is made. Despite many construction activities had already been completed for Mersin-Gaziantep Railway Project, and only electricity works are of concern in such sections of the Project. By considering the following factors and in accordance with the international standards (see Section 3.3), this high-speed railway project has been designated as a Category A project, because it may cause significant adverse environmental and social impacts that may be diverse and irreversible:

- Length of the Project,
- Activities on greenfield areas ,
- Number of employees,
- Cross section with many surface water bodies,
- Passing through crowded cities / settlements,
- Passing through some important natural areas (see Section 2.3).

4.3 Overall Schedule of the ESIA

The overall schedule of the ESIA Report development is presented in Figure 4.1.

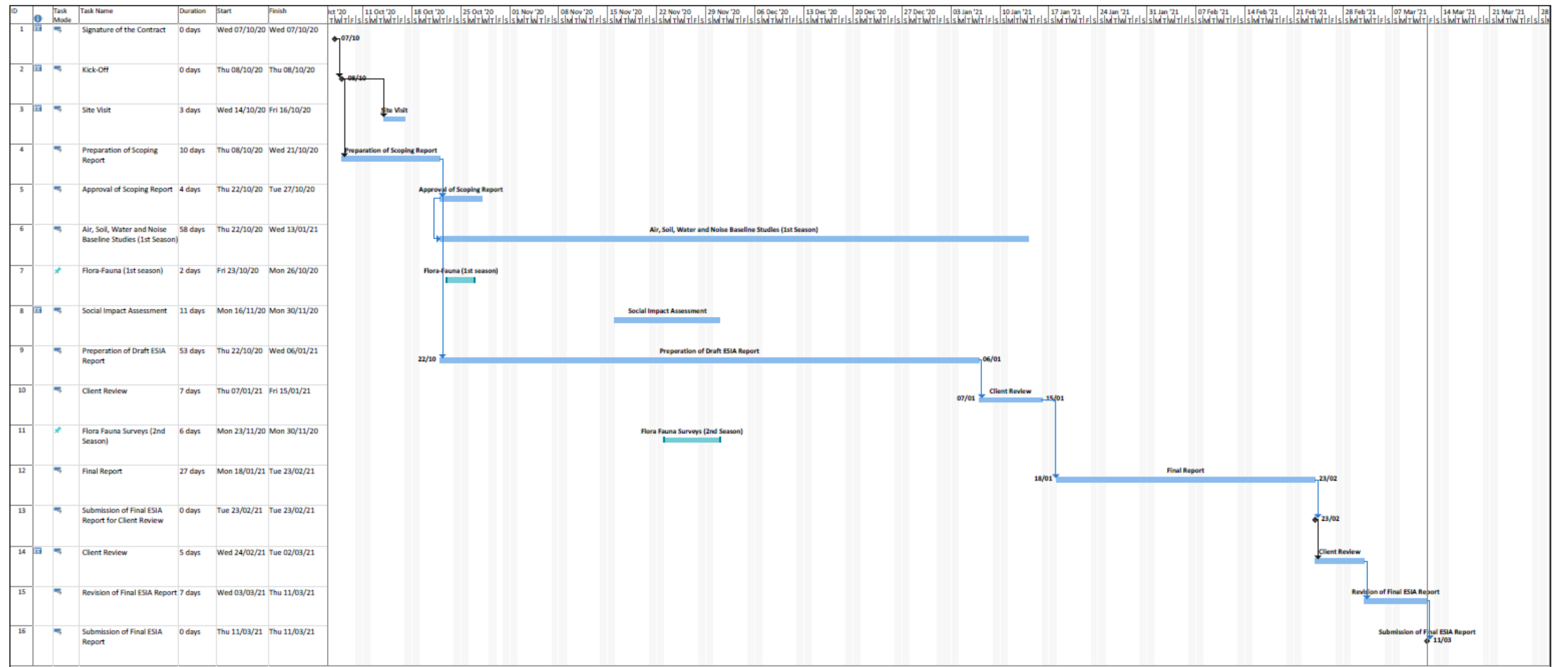


Figure 4.1: Schedule of the ESIA

4.4 Proposed Additional Baseline Studies

The baseline studies is an early element in the monitoring and evaluation plan and provide a reference point against which any future changes associated with the project activities can be assessed together with their efficiency level and offer information for subsequent monitoring; therefore, this chapter focuses on the baseline conditions of the key environmental issues at the project area and its close vicinity.

In this context, environmental baseline features are described to form a basis for the impacts of the project and the related mitigation measures. The baseline features also serves as a comparison criteria for the status of the area before and after the implementation of the project.

The main studies and data sources that contribute to gathering of baseline information include:

- Desktop studies;
- Existing data belonging to the project site and its close vicinity from literature reviews;
- Former EIA & Pre-EIA Reports of the Project;
- Data from State Authorities;
- Maps and photos;
- Site surveys;
- Laboratory tests and analyses.

4.4.1 Air & Water Quality and Noise Level Measurements

Summary of the baseline studies to be conducted are listed in Table 4.1, and the sampling/measurements locations are shown between Figure 4.3 and Figure 4.4 on the map. PM₁₀, PM_{2.5} and settled dust measurement points have been determined as depending on the pre air quality modelling study. All sampling, analysis and measurements will be conducted by an accredited laboratory by MoEU and TURKAK (i.e. FEBAS).

Table 4.1: Summary of Environmental Baseline Measurements

No	Measurement	Sampling/Measurement Point	Duration
1	PM ₁₀	10	1 Month
2	PM _{2.5}	10	1 Month
3	Settled Dust	15	2 Months
4	Surface Water	20	Spot Sampling
5	Noise Level	20	15 minutes of daytime, evening and night noise measurement for 3 days



Figure 4.2: PM₁₀ and PM_{2.5} Measurement Points

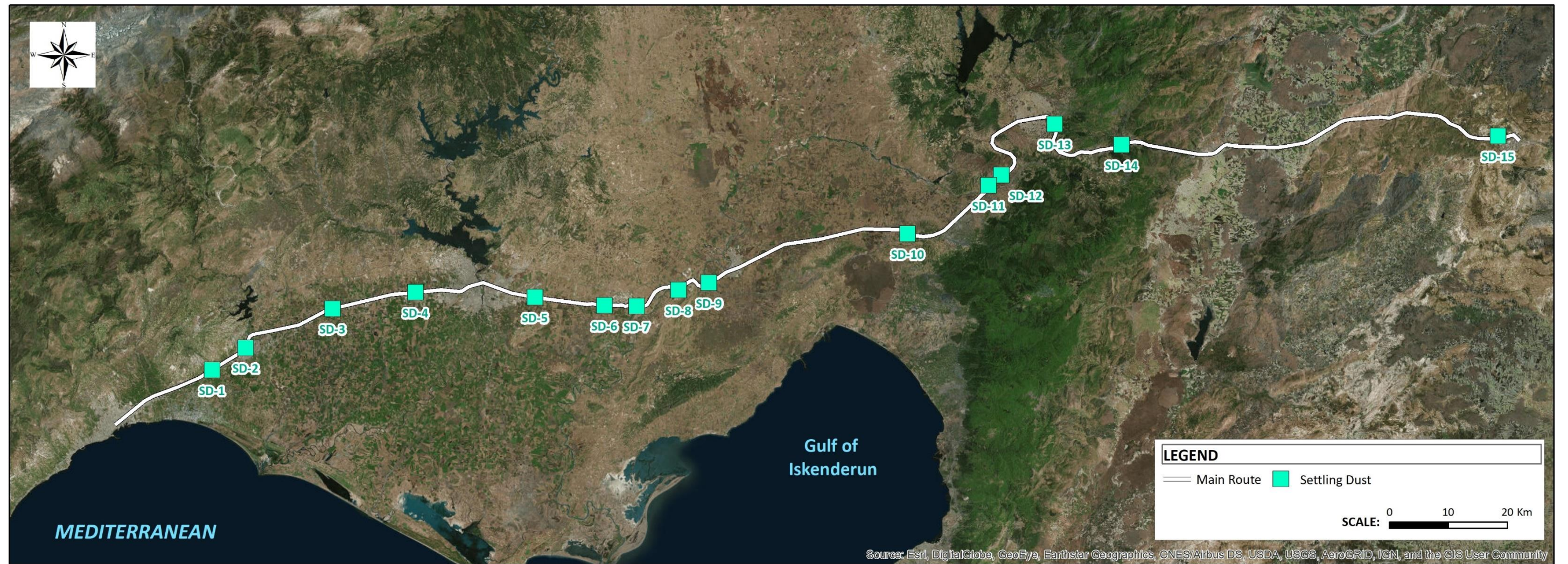


Figure 4.3: Settled Dust Measurement Points



Figure 4.4: Surface Water Sampling Points

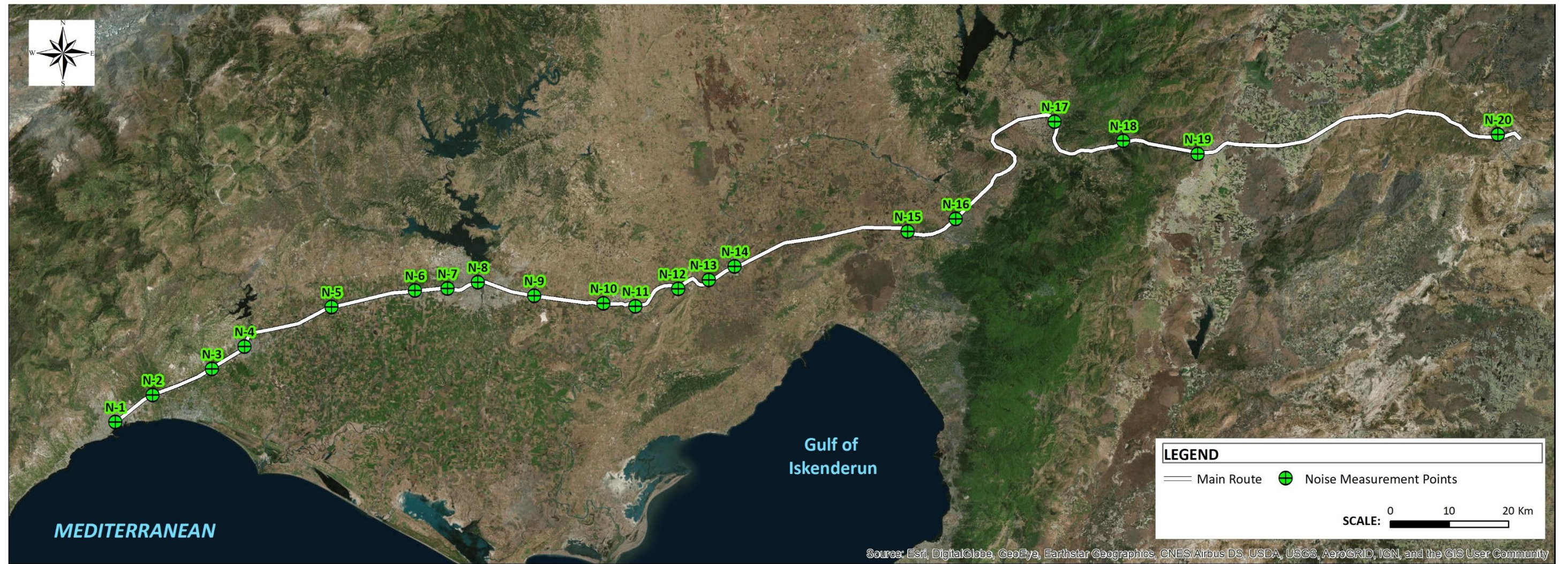


Figure 4.5: Noise Level Measurement Points

4.4.2 Flora & Fauna Studies

The flora & fauna studies will be performed:

- To obtain desktop and field data on terrestrial flora and fauna species along the line,
- To provide detailed data of the main terrestrial habitats and related flora species and fauna species,
- To identify and focus on the habitats and species that are protected, at risk or species requiring special attention, or species that could suffer from the project related impacts,
- To evaluate the biological diversity,
- To define the status of the endemic, globally threatened and restricted range species,
- To identify the baseline conditions for the species to constitute a basis for the evaluation of the potential impacts of the project on all levels of biodiversity as an integral part of the environmental assessment process.

The first step of the survey is the desktop study. In this scope, a thorough search of the available literature on the distribution, population and ecology of the species likely to occur within the project area will be conducted.

The area will be evaluated by the use of available topographical maps and satellite images (Google Earth) to detect and validate the different habitat types and vegetation cover. As a result of the evaluating maps and satellite images in addition to literature review, possible stations along the line will be selected.

After evaluating of maps and literature data, it is determined that the areas having natural and undisturbed characteristics are located between Toprakkale-Osmaniye and Osmaniye-Gaziantep. In this scope, the locations where construction activities dense such as tunnels, camps and their close vicinity will be surveyed. The surveyors will be travel along the railway and studied proper locations in both anthropogenic areas, agricultural lands and natural areas.

Flora

In the course of field surveys, the specialists will aim to put forth the following information:

- General description of the habitats in the project area and its close vicinity;
- Identification and description of the sensitive or rare habitats
- Definition of characteristics of these components such as local relative abundance, general distribution of species statuses according to national and international legislations;
- Regional, national and international significance of species and level of legal protection, endemism statuses;
- Species' names in Latin and English, phytogeographical region, distribution, whether it is endemic or not and the relative abundance will be given in flora list. IUCN, Bern and CITES risk categories,
- Potential adverse impacts of the Project on the species and on the habitats and mitigation measures.

Fauna

In the course of field surveys, the specialists will aim to put forth the following information:

- General description of the habitats,
- Identification and description of the sensitive or rare habitats of species;
- Classification and description of the species (endemism, IUCN, CITES, Bern);
- Inventory of species - globally threatened species, nationally threatened species, migratory species and any endemic or restricted range species occurring therein;
- Relation of the species with the Project area;
- Regional, national and international significance of species and level of legal protection;

- Potential adverse impacts of the project on the species and on the habitats and mitigation measures.

The species and their signs of various activities, such as footprints, nests, etc., will be photographed by cameras. The photographs will not only assist in preparing a photograph archive of the area, but also present the opportunity of comprehensive study in case of any difficulty in identification of the species during the field study.

The area will be surveyed for the determination of biological requirements of the species; in other words, to see if the species are using the area for nutrition, nesting, roaming, reproduction and socializing, etc. as well temporarily as permanently.

While evaluating of species both flora and fauna, methodology will be used given below.

International Union for Conservation of Nature (IUCN)

IUCN “Red List of Threatened Species” is widely recognized as the most comprehensive, objective global approach for evaluating the conservation status of plant and animal species.

The IUCN Red List Categories and Criteria are intended to be an easily and widely understood system for classifying species at high risk of global extinction. The general aim of the system is to provide an explicit, objective framework for the classification of the broadest range of species according to their extinction risk. However, while the Red List may focus attention on those taxa at the highest risk, it is not the sole means of setting priorities for conservation measures for their protection.

Extensive consultation and testing in the development of the system strongly suggest that it is robust across most organisms. However, it should be noted that although the system places species into the threatened categories with a high degree of consistency, the criteria do not take into account the life histories of every species. Hence, in certain individual cases, the risk of extinction may be under or over estimated. The IUCN Council adopted the new Red List system in 1994.

The IUCN Red List Categories and Criteria have several specific aims:

- to provide a system that can be applied consistently by different people;
- to improve objectivity by providing users with clear guidance on how to evaluate different factors which affect the risk of extinction;
- to provide a system which will facilitate comparisons across widely different taxa;
- to give people using threatened species lists for a better understanding of how individual species were classified.

Nine categories are defined for Red List considering extinction rate, population size, geographical distribution areas and population and distribution degree (see Figure 5.2). The red list categories are as follows:

- Extinct, EX
- Extinct in the Wild, EW
- Critically Endangered, CR
- Endangered, EN
- Vulnerable, VU
- Near Threatened, NT
- Least Concern, LC
- Data Deficient, DD
- Not Evaluated, NE

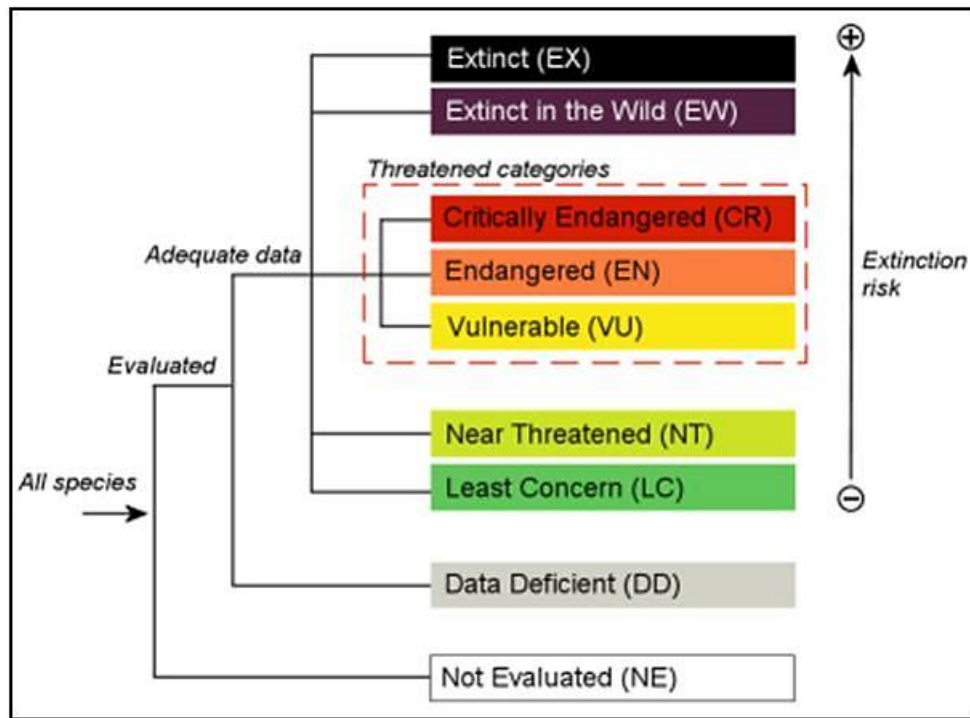


Figure 4.6: Structure of the Red List Categories of IUCN

Bern Convention

The Convention on the Conservation of European Wildlife and Natural Habitats was signed on October 19, 1979 in Bern. In Turkey, this convention was approved by the Decree of Council of Ministers numbered 84-7601, and became effective by publishing in the Official Gazette dated February 20, 1984 and numbered 18318.

The aim of this convention is to ensure the conservation of European wildlife and natural habitats by means of cooperation between the States who signed this convention.

All countries that have signed the Bern Convention must take action to:

- promote national policies for the conservation of wild flora and fauna, and their natural habitats;
- have regard to the conservation of wild flora and fauna in their planning and development policies; and in their measures against pollution;
- promote education and disseminate general information on the need to conserve species of wild flora and fauna and their habitats;
- encourage and co-ordinate research related to the purposes of this Convention.

And also co-operate to enhance the effectiveness of these measures through:

- co-ordination of efforts to protect migratory species; and
- the exchange of information and the sharing of experience and expertise.

Appendices of the Bern Convention give the species list needing to be protected. The list of appendices and content of each appendix is given below:

- Annex I: Strictly protected flora species (may not be taken from the wild or harmed);
- Annex II: Strictly protected fauna species (may be neither disturbed nor captured, killed or traded);

- Annex III: Protected fauna species (species that are in need of protection but may be hunted or otherwise exploited in exceptional instances);
- Annex IV: Prohibited means and methods of killing, capture and other forms of exploitation.

Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES is a multilateral treaty to protect endangered plants and animals. It was drafted as a result of a resolution adopted in 1963 at a meeting of members of the IUCN (International Union for Conservation of Nature). The convention was opened for signature in 1973, and CITES entered into force on 1st of July 1975. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild, and it accords varying degrees of protection to more than 35,000 species of animals and plants. In order to ensure that the GATT (General Agreement on Tariffs and Trade) was not violated, the Secretariat of GATT was consulted during the drafting process. Turkey was partied CITES on 22nd of December 1996. Appendices I, II and III to the Convention are lists of species afforded different levels or types of protection from over-exploitation. Content of each appendix is given below:

- **Appendix I:** lists species that are the most endangered among CITES-listed animals and plants. They are threatened with extinction and CITES prohibits international trade in specimens of these species except when the purpose of the import is for instance for scientific research.
- **Appendix II:** lists species that are now not necessarily threatened with extinction but that may become so unless trade is closely controlled. International trade in specimens of Appendix-II species may be authorized by the granting of an export permit or re-export certificate.
- **Appendix III:** is a list of species included at the request of a Party that already regulates trade in the species and that needs the cooperation of other countries to prevent unsustainable or illegal exploitation. International trade in specimens of species listed in this Appendix is allowed only on presentation of the appropriate permits or certificates.

4.5 International Standards

Among the potential creditor corporations for the Project, the social and environmental standards and guiding documents of International Finance Corporation (IFC) and European Bank for Reconstruction and Development (EBRD) shall be taken as basis for every phase of the Project. All these standards serve for the improvement of the project's performance through its evaluation in environmental and social aspect by minimizing of negative impacts and increasing in contributions.

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4.5.1 Social Impact Assessment Baseline Studies

Mersin, Adana, Osmaniye and Gaziantep Provinces are located on the route of the railway project. The main stations are in Mersin and Adana Provinces, Toprakkale, Bahçe and Nurdağı Districts, Başpınar Quarter and Mustafa Yavuz locality. All of these settlements are located in the south and southeast of Turkey.

4.5.1.1 Field Survey Methodology

Both qualitative and quantitative methods will be used in this research to gather data. In this study, the use of quantitative data from statistically representative samples is more appropriate for cause-effect assessment, which provides results that can be generalized. However, qualitative methods allow specific subject matters, situations or events to be examined in more details and make it possible to see the perspective and dynamics of persons/groups affected by the project, or the underlying reasons of results observed in the quantitative analysis. These techniques usually provide the critical understanding of the value that people affected by the project give to this project and processes that can affect the outcome, and a deeper interpretation of the results observed in quantitative analysis.

Data will be collected for this research by using the following methods:

- Secondary data,
- Surveys (Household survey and mukhtar survey),
- Focus Group Discussions.

Secondary Data

Secondary data sources will be used in this study include census data, geographical data (including maps), and national and local government statistics and documents.

Surveys

The questionnaires will be prepared before starting the field research. Interviewers, who will conduct the Household Survey, will receive a training in order to assure standardization in data gathering and minimize the bias of interviewers prior to survey.

The household surveys and the mukhtar surveys are the most important tools for collecting the basic information that will be used in the social impact assessment process.

Household Survey

The objective of the household survey is to gather information about general socio-economic status of the households within the research area and their general opinions and expectations about the Project. The household survey will be conducted through face-to-face interviews.

Method used to reach households that will accurately represent this sample in the districts;

- The settlement is on the railway line, and
- Adjacent to the railway line of the settlement.

Settlements that meet the above criteria has been selected and presented in Table 4.2

Table 4.2: Distribution of Household Questionnaires per Settlements

Row Number	Province	District	Total Number of Household Questionnaires
1	Mersin	Akdeniz	18
2	Mersin	Tarsus	27
3	Adana	Seyhan	32
4	Adana	Yüreğir	20
5	Adana	Sarıçam	4
6	Adana	Ceyhan	14
7	Osmaniye	Toprakkale	2
8	Osmaniye	Central	19
9	Osmaniye	Düziçi	5
10	Osmaniye	Bahçe	0
11	Gaziantep	Nurdağı	5
12	Gaziantep	Şehitkamil	5
TOTAL			150

Mukhtar Survey

In metropolitan areas (urban areas) where the population density is high, such as Seyhan, Yüreğir, Akdeniz and Tarsus, the number of quarter is small, and the number of populations of the quarters is high. On the other hand, in districts (rural areas) where the population density is low, such as Düziçi and Nurdağı, the number of villages is high, and the number of populations of the villages is low.

Support will be taken from Mukhtar survey to close this gap between “urban areas” and “rural areas” included in the sample. For this reason, Mukhtar survey will be conducted in “villages and quarters not in the center of the city /district”, which are considered “rural areas”.

The rural areas where Mukhtar surveys will be conducted are presented in Table 4.3. These settlements are connected to, Ceyhan, Toprakkale, Düziçi, Bahçe, Nurdağı and Şehitkamil Districts.

Table 4.3: Distribution of Mukhtar Questionnaires by Settlements

Province	District	Number of settlements suitable for selection criteria	Number of Mukhtar Questionnaire
Adana	Ceyhan	25	9
Osmaniye	Toprakkale	6	1
Osmaniye	Düziçi	15	3
Osmaniye	Bahçe	7	6
Gaziantep	Nurdağı	16	7
Gaziantep	Şehitkamil	8	6
TOTAL		77	32

Focus Group Discussion

A focus group discussion/interview is a group process structured to obtain detailed information about a particular subject matter. A focus group discussion consists of 7-12 participants to discuss a clearly defined topic. Open-ended questions are asked during the discussions.

In this study, 4 focus group meetings are planned to represent each province.

4.5.2 Stakeholder Engagement

Stakeholder Engagement Plan (SEP) of the Mersin-Gaziantep Railway Project is part of the ESIA process.

SEP will be developed to ensure the process of interaction with the stakeholders in the course of implementation of the Project.

Addition to household, mukhtar surveys and focus group discussions, stakeholder surveys will be conducted. Possible stakeholders are given in tables as per cities below and for each city four stakeholder surveys will be conducted (see Table 4.4 - Table 4.7).

Table 4.4: Potential Stakeholders in Mersin Province

Community Stakeholders	Name of Stakeholder	Identification	Strategic Objective
Governorate	Mersin Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Akdeniz District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Tarsus District Governorate	Authorities	Possible participation in the implementation of the project
Municipalities	Mersin Metropolitan Municipality	Authorities	Possible participation in the implementation of the project
Sub branch	Department of Zoning and Urban Planning	Authorities	Possible participation in the implementation of the project
Municipalities	Akdeniz Municipality	Authorities	Possible participation in the implementation of the project
Municipalities	Tarsus Municipality	Authorities	Possible participation in the implementation of the project
Universities	Rectorate of Mersin University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Çağ University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Toros University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Tarsus University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Mersin Port Authority (Republic of Turkey Ministry of Transport and Infrastructure)	Authorities	Possible participation in the implementation of the project
Public Institutions	Mersin Provincial Directorate of Environment and Urbanisation	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Mersin Provincial Directorate of National Education	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Mersin Provincial Directorate of Health	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Mersin Provincial Directorate of Agriculture and Forestry	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Mersin Provincial Directorate of Family, Labour and Social Services	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Mersin Port Authority Control Directorate (General Directorate of Turkish State Railways (TCDD))	Authorities	Possible participation in the implementation of the project
Chambers, Unions and Development Agencies	Mersin Chamber of Commerce and Industry	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Mersin Chamber of Shipping	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Mersin Chamber of Agriculture	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Mersin Chamber of Merchants and Craftsmen	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Directorate of Mersin Tarsus Organized Industrial Zone	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Mersin Chamber of Drivers	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Associations	Eastern Mediterranean Federation Of Disabled Associations	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Associations	The Association of Enterprising Business Women	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Local Media	Hakimiyet Newspaper	Representatives of local communication	Possibility to have an interest in the Project
Local Media	Güney Newspaper	Representatives of local communication	Possibility to have an interest in the Project

Table 4.5: Potential Stakeholders in Adana Province

Community Stakeholders	Name of Stakeholder	Identification	Strategic Objective
Governorate	Adana Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Seyhan District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Yüreğir District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Ceyhan District Governorate	Authorities	Possible participation in the implementation of the project
Municipalities	Adana Metropolitan Municipality	Authorities	Possible participation in the implementation of the project
Sub branch	Department of Zoning and Urban Planning	Authorities	Possible participation in the implementation of the project
Municipalities	Seyhan Municipality	Authorities	Possible participation in the implementation of the project
Municipalities	Yüreğir Municipality	Authorities	Possible participation in the implementation of the project
Municipalities	Ceyhan Municipality	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Çukurova University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Adana Alparslan Türkeş Science and Technology University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Adana Provincial Directorate of Family, Labour and Social Services	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Adana Provincial Directorate of Environment and Urbanisation	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Adana Provincial Directorate of National Education	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Adana Provincial Directorate of Health	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Adana Provincial Directorate of Agriculture and Forestry	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	6th Regional Directorate (General Directorate of Turkish State Railways (TCDD))	Authorities	Possible participation in the implementation of the project
Public Institutions	V. Regional Directorate (Republic of Turkey Ministry of Transport and Infrastructure)	Authorities	Possible participation in the implementation of the project
Chambers, Unions and Development Agencies	Adana Chamber of Industry	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Adana Chamber of Commerce	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Adana Chamber of Merchants and Craftsmen	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Adana Chamber of Drivers	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Adana Chamber of Agriculture	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Regional Directorate of Adana Hacı Sabancı Organized Industrial Zone (AOSB)	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	General Secreteriat of Çukurova Development Agency	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Adana Directorate of Small and Medium Industry Development Organization (KOSGEB)	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Associations	Adana Branch Office of Turkish Handicap Association	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Associations	Adana Children's and Women's Rights Association	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Associations	Association for Solidarity with the Elderly	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Local Media	5 Ocak Newspaper	Representatives of local communication	Possibility to have an interest in the Project
Local Media	Yeni Adana Newspaper	Representatives of local communication	Possibility to have an interest in the Project

Table 4.6: Potential Stakeholders in Osmaniye Province

Community Stakeholders	Name of Stakeholder	Identification	Strategic Objective
Governorate	Osmaniye Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Osmaniye District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Toprakkale District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Düziçi District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Bahçe District Governorate	Authorities	Possible participation in the implementation of the project
Municipalities	Osmaniye Municipality	Authorities	Possible participation in the implementation of the project
Sub branch	Department of Zoning and Urban Planning	Authorities	Possible participation in the implementation of the project
Municipalities	Toprakkale Municipality	Authorities	Possible participation in the implementation of the project
Municipalities	Düziçi Municipality	Authorities	Possible participation in the implementation of the project
Municipalities	Bahçe Municipality	Authorities	Possible participation in the implementation of the project
Universities	Rectorate of Osmaniye Korkut Ata University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Osmaniye Provincial Directorate of Family, Labour and Social Services	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Osmaniye Provincial Directorate of Environment and Urbanisation	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Osmaniye Provincial Directorate of National Education	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Osmaniye Provincial Directorate of Health	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Osmaniye Provincial Directorate of Agriculture and Forestry	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Osmaniye Chamber of Commerce and Industry	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Osmaniye Chamber of Merchants and Craftsmen	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Osmaniye Chamber of Drivers	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Osmaniye Chamber of Agriculture	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Directorate of Osmaniye Organized Industrial Zone	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Osmaniye Directorate of Small and Medium Industry Development Organization (KOSGEB)	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Eastern Mediterranean Development Agency (DOĞAKA)	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Associations	Osmaniye Branch Office of Turkish Beyazay Association	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Associations	Osmaniye Women's Platform Association	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Local Media	Akdeniz Newspaper	Representatives of local communication	Possibility to have an interest in the Project
Local Media	Başak Newspaper	Representatives of local communication	Possibility to have an interest in the Project

Table 4.7: Potential Stakeholders in Gaziantep Province

Community Stakeholders	Name of Stakeholder	Identification	Strategic Objective
Governorate	Gaziantep Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Nurdağı District Governorate	Authorities	Possible participation in the implementation of the project
District Governorate	Şehitkamil District Governorate	Authorities	Possible participation in the implementation of the project
Municipalities	Gaziantep Metropolitan Municipality	Authorities	Possible participation in the implementation of the project
Sub branch	Department of Zoning and Urban Planning	Authorities	Possible participation in the implementation of the project
Municipalities	Nurdağı Municipality	Authorities	Possible participation in the implementation of the project
Municipalities	Şehitkamil Municipality	Authorities	Possible participation in the implementation of the project
Universities	Rectorate of Gaziantep University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Hasan Kalyoncu University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Sanko University	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Universities	Rectorate of Gaziantep Islamic University of Science and Technology	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Gaziantep Provincial Directorate of Family, Labour and Social Services	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Gaziantep Provincial Directorate of Environment and Urbanisation	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Gaziantep Provincial Directorate of National Education	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Gaziantep Provincial Directorate of Health	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	Gaziantep Provincial Directorate of Agriculture and Forestry	Representatives of potential beneficiary	Possibility to influence and make decisions and/or have an interest in the Project
Public Institutions	VII. Regional Directorate (Republic of Turkey Ministry of Transport and Infrastructure)	Authorities	Possible participation in the implementation of the project
Chambers, Unions and Development Agencies	Gaziantep Chamber of Industry	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Gaziantep Chamber of Commerce	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Gaziantep Chamber of Merchants and Craftsmen	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Gaziantep Chamber of Drivers	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Gaziantep Chamber of Agriculture	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Directorate of Gaziantep Organized Industrial Zone	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	İpekyolu Development Agency	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Chambers, Unions and Development Agencies	Gaziantep Directorate of Small and Medium Industry Development Organization (KOSGEB)	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Associations	Gaziantep Branch Office of Association of Private Educational Institutions	Decision makers	Possibility to influence and make decisions and/or have an interest in the Project
Associations	Gaziantep Branch Office of Turkish Women's Union	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Associations	Gaziantep Elderly Protection Association	NGOs that may be interested in project	Vulnerable people and social groups that may be more negatively affected by the Project
Local Media	Gaziantep 27 Newspaper	Representatives of local communication	Possibility to have an interest in the Project
Local Media	Gaziantep Güneş Newspaper	Representatives of local communication	Possibility to have an interest in the Project

The purpose of the SEP is to establish and maintain positive relationships with external stakeholders (i.e. individuals, communities, local government authorities, or other interested/affected parties) over the lifetime of the project.

The SEP also includes a grievance mechanism for community members and other stakeholders to raise any concerns and problems related to the Project.

Stakeholder engagement is an ongoing process and the SEP should be regularly monitored and updated throughout all stages of the Project implementation.

4.5.3 Table of Contents of the ESIA Report

The ESIA Report will be developed as per the Table of Contents presented in Attachment C.

4.6 Impact Assessment Methodology

The impact assessment process is carried out in three steps, which are identification, assessment and mitigation. The identification stage consists of a systematic definition of possible impacts for all phases of the project. Project related activities and facilities through all phases are considered in terms of their interaction with the environment in order to determine the potential impacts, both adverse and beneficial, on the environment. Potential impacts are evaluated for the relevant stages of the project cycle (construction, operation and decommissioning).

Measures are developed to avoid, or where avoidance is not possible, minimize, mitigate or offset/compensate for identified potential impacts associated with the project on the environment.

The impacts will be assessed after obtaining the baseline information, which shows the existing status of the environment. The findings of the assessment must be compliant with both the applicable national regulations and the international standards. The mitigation measures will be addressed in the ESIA Report, if there are any adverse impacts associated with the proposed Project.

4.6.1 Air Quality

The information on baseline air quality will be obtained through air quality measurements for settled dust, PM₁₀ and PM_{2.5}. The impacts of the project on the local air quality will be estimated through air quality dispersion modelling.

There are many air quality distribution models, which have been developed and are being developed by various institutes/institutions around the world. At the time of selecting Air Quality Distribution Model, factors such as the location of emission sources and receptors, regional conditions, qualities of emissions of which distribution is desired to be determined, and chemical reactions play an important role.

There are two basic models preferred and recommended by the MoEU and US-EPA. These are AERMOD and CALPUFF, and they both have different superiorities.

AERMOD: This is a plume model with a fixed status including air distribution based on planetary limit layer turbulence structure and concepts of scaling including processing both surface and elevated sources as well as both simple and complicated terrains. (The US Environment Protection Agency, 2018). US-EPA suggests it in cases where the distance between the source and the receiving point is below 50 km. Our experiences have indicated that AERMOD model gives proper results up to a distance of 20-25 km.

CALPUFF: A non-stationary puff dispersion model that simulates effects of meteorological conditions varying in time and space on carriage, transformation and removal of pollution. CALPUFF can be applied for long-distance carriage and complicated terrain. (The US Environment Protection Agency, 2018).

For the Project, CALPUFF will be used for modelling studies because of long-distance carriage and complicated terrain.

The air quality impact assessment will include the calculation of contribution value to air pollution based on the existing air quality, the estimated volumetric and mass flow rates for the sources and air quality dispersion modelling results.

The dispersion modelling will cover the impact area of the project and concentrations determined in this modelling area. In addition, maximum point of impact will be determined by the model. Daily average and maximum and annual average values will be compared with the relevant ambient air quality standards to demonstrate compliance. The modelling procedure, input parameters, assumptions, project-alone and cumulative impacts will be explained with tables and maps of concentration contours in the ESIA Report.

4.6.2 Soil Quality

The impacts of the Project on the soil fertility in the vicinity of the activities, the agricultural use of the affected areas will be assessed and presented in the ESIA Report.

4.6.3 Water Quality

The compliance with the applicable water quality criteria associated with water supply, wastewater discharge, intersections with water bodies, and ambient receiving water quality will be reviewed and evaluated in the ESIA Report.

4.6.4 Noise Levels

The noise levels measured on site as baseline data and noise level modelling results will be compared with the applicable day, evening and night noise limits and necessary discussion will be provided in the ESIA Report.

4.6.5 Solid and Hazardous Waste

The quantities and types of solid waste will be estimated, which is likely to be produced annually, and the results and handling methods will be presented in the ESIA Report. The related regulations will also be presented for impact assessment discussions.

4.6.6 Traffic and Transport

The project activities can lead to increased traffic due to construction machines and transport of the raw materials during construction phase.

Baseline traffic count data of the General Directorate of Highways will be obtained and also the lane configurations will be studied. The traffic load on the existing roads will be calculated and assessed in ESIA Report.

4.6.7 Archaeology and Cultural Heritage

Potential impacts on archaeology primarily relate to the possibility of the disturbance, removal or destruction of archaeological deposits during demolition and construction works, including the construction of building foundations. A desk based archaeological and built heritage assessment will be undertaken using available archaeological and historical information from documentary and cartographic sources.

The cultural heritage topic considers potential environmental impacts on:

- Archaeological remains – These may be buried traces of human activities, sites visible above ground, or moveable artefacts and include buildings, structures, earthworks, landscapes; human, animal or plant remains;
- Historic buildings – These may include structures that have no aesthetic appeal or structures not usually thought of as ‘buildings’, such as milestones or bridges; and
- Historic landscape – Evidence of past human activities is a significant part of the Historic Landscape and may derive both from archaeological remains and historic buildings within it.

Individual archaeological remains, historic buildings, and historic landscape types are referred to as cultural heritage assets.

4.6.8 Visual Impacts

The site is visible from neighboring residential and commercial properties and roads. 3D visual impact assessment studies will be performed and presented in the ESIA Report.

Different methods can be used in the assessment of visual effects, taking into account the field conditions and the width of the working area. Among these methods, one of the most preferred methods is the visualization of the field in three dimensions (3D) in computer environment. Visualization is any technique for creating an image, diagram, or animation to convey a message.

Visualization through visual imagination has been an effective way of communicating both abstract and palpable ideas since the dawn of humanity. By means of visualization, it is possible to evaluate the visual effects of the project with GIS and 3D Visualization software. The visual impact assessment determines the degree of anticipated change to visual amenity, considering the elements that would occur because of the proposed scheme.

The assessment of general potential effects on visual sensitivity is based on the magnitude of change. The potential visual impact of the proposed project is primarily due to changes in visual characteristics in the field of view. The changes in the visual character will depend on the landscape / vegetation structure of the area in the present view and the level of visual contrast with the interaction of these structures with the project.

The potential visual impact of the proposed project is primarily due to changes in visual characteristics in the field of view. The changes in the visual character will depend on the landscape / vegetation structure of the area in the present view and the level of visual contrast with the interaction of these structures with the project. "Guidelines for Landscape and Visual Impact Assessment" and "Visual Representation Guidelines of Scottish Natural Heritage" will be followed to determine visual impacts of project.

The visual impacts of project will be determined with following steps by 3D visualization method :

- The base datasets/layers will be taken from open sources and project owner. These layers:
 - Topography: The topographic structure of the region was determined by the digital elevation model. ASTER DEM v2 or General Directorate Of Mapping Dataset or on-site topographical measurements grid terrain model will used to generate Zone of Theoretical Visibility.
 - Land Use : Land use is an important factor affecting the visibility of the project. In the project area where the average viewing height is 1.6 meters, and the ground is mostly flat, visibility can be obstructed by vegetation. The project area is in an environment within sparsely vegetated area
 - OpenStreetMap Dataset which include following layer:
 - Buildings and human made objects
 - Roads and junctions
 - Rivers
 - Railways and etc.
 - Project route and additional infrastructures
 - 3D designs of project route
- A computer-generated Zone of Theoretical Visibility (ZTV) map will be prepared, based on GIS Softwares. This will be used to assist in viewpoint selection and to illustrate the potential influence of the development in the wider landscape.
- 3D visualization model will be generated by commercial visualization software and existing datasets
- Existing conditions and proposed conditions will be modelled/visualized by 3D renders and photographs.

4.6.9 Flora & Fauna

The impact assessment on flora and fauna will be based on following three task.

- To protect and conserve biodiversity;
- To maintain the benefits from ecosystem services;
- To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.

Accordingly, the direct and possible indirect impacts of the Project on terrestrial flora and fauna populations will be assessed. The diversity of nature, ecosystems and biotopes, the diversity of species and population will be evaluated. The impact on the ecological values of the nearest conservation areas will also be analyzed.

A vegetation map to be prepared during the baseline studies will be presented in the ESIA Report. The flora and fauna species classified with respect to appropriate international conventions will be refined.

The potential effects of the Project on the terrestrial flora and fauna will be estimated and required mitigation measures will be developed in the ESIA Report.

4.6.10 Social Impact Assessment

Interorganizational Committee on Principles and Guidelines for Social Impact Assessment (2003) defines social impacts as follows: “By social impacts we mean the consequences to human populations of any public or private actions that alter the ways in which people live, work, play, relate to one another, organize to meet their needs and generally cope as members of society. The term also includes cultural impacts involving changes to the norms, values, and beliefs that guide and rationalize their cognition of themselves and their society.” [6]

Social impact embodies all human impacts including demographic, economic, cultural, community, infrastructural, gender, political impacts etc. As Vanclay (2003) stated that social impacts is as changes to one or more of the following [15]:

- People’s way of life – that is, how they live, work, play and interact with one another on a day-to-day basis;
- Their culture – that is, their shared beliefs, customs, values and language or dialect;
- Their community – its cohesion, stability, character, services and facilities;
- Their political systems – the extent to which people are able to participate in decisions that affect their lives, the level of democratization that is taking place, and the resources provided for this purpose;
- Their environment – the quality of the air and water people use; the availability and quality of the food they eat; the level of hazard or risk, dust and noise they are exposed to; the adequacy of sanitation, their physical safety, and their access to and control over resources;
- Their health and wellbeing – health is a state of complete physical, mental, social and spiritual wellbeing and not merely the absence of disease or infirmity;
- Their personal and property rights – particularly whether people are economically affected, or experience personal disadvantage which may include a violation of their civil liberties;
- Their fears and aspirations – their perceptions about their safety, their fears about the future of their community, and their aspirations for their future and the future of their children.

According to Vanclay (2003) [15] “SIA includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions”. For him, SIA can be understood as a framework for evaluation of all impacts on humans and on all the ways in which people and communities interact with their socio-cultural, economic and environmental surroundings.

Rappaport (1994) argues that there are six dimensions of the impacts of development: likelihood, magnitude, space, time, cumulative potential, susceptibility to mitigation, distribution of impacts. The effects of impacts would be different in terms of time, space, magnitude, and cumulative potential as mentioned before. Some impacts would be severe but not very consequential; some impact would last a long time or short time and others would be discontinuous or continuous. Some impacts are self-correcting and self-limiting. Sometimes only a small part of society but sometimes all members of society feel these impacts. Furthermore, people could experience these impacts immediately or these impacts could remain hidden for a long time [16].

For these reasons, all potential impacts; negative/positive, long term/short term, planned/unplanned, expected/unexpected will be taken into consideration together in a social impact assessment. Interdependency and mutual interaction among all sorts of impact complicates impacts will be separately assessed.

For this purpose, further studies will be carried out for understanding the existing socio-economic conditions and the perception of the affected communities about the project with the intention to get the real impacts of the project on the communities in compliance with the ESIA requirements. The social study will be initiated with the determination of the objectives of the study and the desktop studies to gather secondary data. During the following data collection process, determination of the study area covering the potentially affected settlements, design and selection of the sampling, training of the personnel to be assigned for the site survey and the data collection will be the steps. This phase of the social study is followed by the analysis of the data collected, evaluation of identified impacts and mitigation, and reporting. The primary data will be collected by using household questionnaires, interviews with mukhtars and interviews with the authorities.

Household questionnaires will be applied to obtain information at household level. Interviews structured by question forms will be carried out in order to gather information at settlement level. Mukhtar interviews will be performed to give information on the project and to seek the opinions of the local people.

4.7 Options excluded from the Investigation

Mersin-Gaziantep Railway Project was developed by the Ministry of Transportation and Infrastructure in early 2010's. In the present, many of the permits have been taken and some construction activities have been completed. Rönesans is responsible only for the task regarding the completion of the missing works and constructing the railway line in some parts, which have not been fully completed yet.

Therefore, "no-development" and "alternative sites" options will not be considered in the ESIA Report.

5 REFERENCES

- [1] Nomenclature of Territorial Units for Statistics (NUTS), Background of NUTS 2021 Classification.
- [2] <https://ec.europa.eu/eurostat/web/nuts/background>. Access date: 01.09.2020
- [3] Correspondence between the NUTS levels and the national administrative units, last update 11/06/2020, based on NUTS 2021 and LAU 2019.
- [4] <https://ec.europa.eu/eurostat/documents/345175/6742814/Correspondence-table-2021-NUTS+SR-EN.xlsx>. Access date: 01.09.2020.
- [5] Eurostat, Local Administrative Units (LAU).
- [6] <https://ec.europa.eu/eurostat/web/nuts/local-administrative-units>. Access date: 01.09.2020
- [7] Republic of Turkey, Ministry of Interior, Inventory of Administrative Division of Turkey.
- [8] <https://www.e-icisleri.gov.tr/Anasayfa/MulkildariBolumleri.aspx>. Access date: 01.09.2020.
- [9] Turkish Statistical Institute, Address Based Population Registration System, <https://biruni.tuik.gov.tr/medas/?kn=95&locale=tr>, Access date: 01.09.2020.
- [10] The Law on the Establishment of a Metropolitan Municipality and Twenty-Seven Districts in Fourteen Provinces and Amendments to Certain Laws And Decrees, Numbered 6360, Dated: 06.12.2012
- [11] <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=6360&MevzuatTur=1&MevzuatTertip=5>, Access date: 01.09.2020.
- [12] The Results of Address Based Population Registration System (ABPRS), 2008-2019 Average size of households by provinces, 2008-2019
- [13] http://www.tuik.gov.tr/PreTablo.do?alt_id=1059, Access date: 01.09.2020.
- [14] Principles and guidelines for social impact assessment in the USA (2003) The Interorganizational Committee on Principles and Guidelines for Social Impact Assessment, Impact Assessment and Project Appraisal, 21:3, 231-250, DOI: 10.3152/147154603781766293.
- [15] Becker, H and Vanclay, F. (eds) (2003) The International Handbook of Social Impact Assessment. Edward Elgar, Cheltenham.pp:6-8.
- [16] Rappaport, R. A. (1994) "Human Environment and the Notion of Impact" in Who Pays the Price? Socio-cultural Context of Environmental Crisis, Barbara Rose Johnston (ed.), Washington, D.C. & Covelo, California: Island Press
- [17] IFC, 2007, Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets.
- [18] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_stakeholderengagement_wci_1319577185063, Access date: 01.09.2020
- [19] IFC, 2012. IFC Performance Standards on Environmental and Social Sustainability.
- [20] https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/sustainability-at-ifc/publications/publications_handbook_pps. Access date: 01.09.2020
- [21] Statistical Region Level 3-Turkey, 2021-NUTS-3 Map.
- [22] <https://ec.europa.eu/eurostat/documents/345175/7451602/2021-NUTS-3-map-TR.pdf>. Access date: 01.09.2020.
- [23] Turkish Statistical Institute, Main Labour Force Statistics by Province, Analytical Framework, Concepts, Definitions, and Classifications.
- [24] http://www.turkstat.gov.tr/PreTablo.do?alt_id=1007. Access date: 01.09.2020
- [25] Turkish Statistical Institute, Regional Results of Labour Force Statistics.
- [26] <https://biruni.tuik.gov.tr/medas/?kn=95&locale=en>, Access date: 01.09.2020.
- [27] Çukurova Development Agency, 2014-2023 Region Plan.
- [28] <https://www.cka.org.tr/tr/sayfa/bolge-planlari>. Access date: 01.09.2020.
- [29] Eastern Mediterranean Development Agency, Economic Values for Osmaniye
- [30] <https://www.dogaka.gov.tr/dogu-akdeniz/osmaniye/ekonomik-veriler>. Access date: 01.09.2020.
- [31] Silk Road Development Agency, Data for Gaziantep
- [32] <https://www.ika.org.tr/Gaziantep-detail-231.html>. Access date: 01.09.2020.
- [33] Gaziantep Chamber of Commerce, Economy of Gaziantep.
- [34] <https://www.gto.org.tr/tr/genel-sayfa/gaziantep/ekonomi-4.html>. Access date: 01.09.2020.

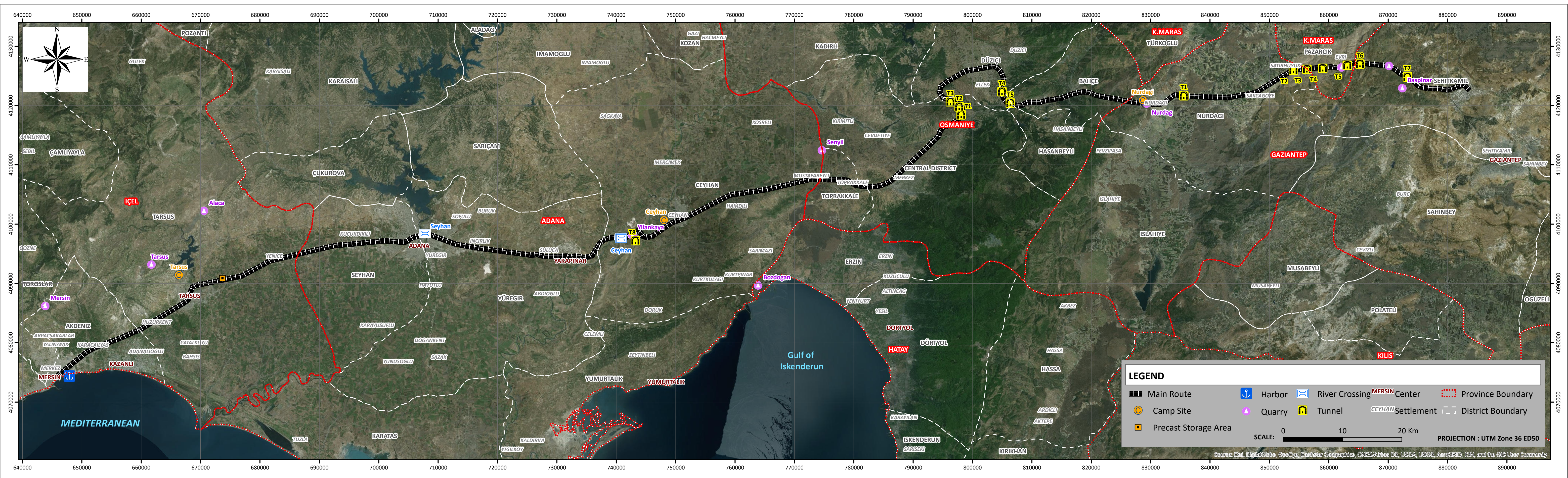
6 ATTACHMENTS

- Attachment A – Terms & Definitions
- Attachment B – General Map of the Project
- Attachment C – Full List of the Table of Content of the ESIA

Attachment A: Terms & Definitions

TERM	DEFINITION
Assystem Envy	Assystem ENVY Energy and Environmental Investments Inc.
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
EBRD	European Bank for Reconstruction and Development
EHS	Environment, Health and Safety
EIA	Environmental Impact Assessment
ENR	Engineering News-Record
EPFI	Equator Principles Financial Institutions
ESIA	Environmental and Social Impact Assessment
EST	Electrification, signaling and telecommunication
EU	European Union
FEBAS	FEBAS Environmental Laboratory Analysis Industry and Trade Ltd. Co.
GATT	General Agreement on Tariffs and Trade
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
MACOM	MACOM Environmental Energy and Technology Investments Ltd. Co
MAK	Central Game Commission
MoEU	Ministry of Environment and Urbanization
PM10	Particulate matter 10 micrometers or less in diameter
PM2.5	Particulate matter 2.5 micrometers or less in diameter
PR	Performance Requirements
Project	Mersin-Adana-Osmaniye-Gaziantep High-Speed Railway Project
PS	Performance standards
Rönesans	Rönesans Holding (Also REC Uluslararası İnşaat Yatırım Sanayi ve Ticaret A.Ş.)
SD	Settled Dust
SEP	Stakeholder Engagement Plan
SW	Surface Water
TCDD	General Directorate of State Railways of the Republic of Turkey
US-EPA	United States Environment Protection Agency

Attachment B: General Map of the Project



Attachment C: Full List of the Table of Content of the ESIA

NON-TECHNICAL SUMMARY

1. INTRODUCTION

- 1.1 Project Information
- 1.2 Scope of Works
- 1.3 Study Limitations

2. POLICIES AND LEGAL FRAMEWORK

- 2.1 Turkish Environmental and Social Policies and Legislations
- 2.2 International E&S Standards

3. PROJECT DESCRIPTION

- 3.1 Project Overview
- 3.2 Project Categorization
- 3.3 Project Scope and Extend
- 3.4 Project Units
 - 3.4.1 Earthworks
 - 3.4.2 Stations and Buildings
 - 3.4.3 Rail and Loop/Siding Development
 - 3.4.4 Station Access Roads
 - 3.4.5 Bridges, Tunnels and Engineering Structures
 - 3.4.6 Signalization and Electrical Infrastructure
 - 3.4.7 Temporary (Construction Phase) Units
- 3.5 Project Background/History

4. ENVIRONMENTAL IMPACT ASSESSMENT

4.1 Impact Assessment Methodology (Impact Magnitude and Sensitivity Criteria may re-define in each section)

- 4.1.1 Describing the sensitivity, value or importance of receptors
- 4.1.2 Magnitude of impacts
- 4.1.3 Describing the significance of effects
- 4.1.4 Residual effects
- 4.1.5 Approach to Mitigation
- 4.1.6 Types of Effects

4.2 Land Use, Topography and Soils

- 4.2.1 Introduction
- 4.2.2 Policies, Legal Framework and Guidelines
- 4.2.3 Extend of Study Area

- 4.2.4 Identification of Baseline Conditions
- 4.2.5 Impact Magnitude and Sensitivity Criteria
- 4.2.6 Impact Assessment
- 4.2.7 Cumulative Impact Assessment
- 4.2.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
- 4.2.9 Mitigation Measures
- 4.2.10 Assumptions and/or Limitations

4.3 Air Quality

- 4.3.1 Introduction
- 4.3.2 Policies, Legal Framework and Guidelines
- 4.3.3 Extend of Study Area
- 4.3.4 Identification of Baseline Conditions
- 4.3.5 Impact Magnitude and Sensitivity Criteria
- 4.3.6 Impact Assessment
- 4.3.7 Cumulative Impact Assessment
- 4.3.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
- 4.3.9 Mitigation Measures
- 4.3.10 Assumptions and/or Limitations

4.4 Visual

- 4.4.1 Introduction
- 4.4.2 Policies, Legal Framework and Guidelines
- 4.4.3 Extend of Study Area
- 4.4.4 Identification of Baseline Conditions
- 4.4.5 Impact Magnitude and Sensitivity Criteria
- 4.4.6 Impact Assessment
- 4.4.7 Cumulative Impact Assessment
- 4.4.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
- 4.4.9 Mitigation Measures
- 4.4.10 Assumptions and/or Limitations

4.5 Water Resources

- 4.5.1 Introduction
- 4.5.2 Policies, Legal Framework and Guidelines
- 4.5.3 Extend of Study Area
- 4.5.4 Identification of Baseline Conditions
- 4.5.5 Impact Magnitude and Sensitivity Criteria

- 4.5.6 Impact Assessment
- 4.5.7 Cumulative Impact Assessment
- 4.5.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
- 4.5.9 Mitigation Measures
- 4.5.10 Assumptions and/or Limitations
- 4.6 Greenhouse Gases (GHG)
 - 4.6.1 Introduction
 - 4.6.2 Policies, Legal Framework and Guidelines
 - 4.6.3 Extend of Study Area
 - 4.6.4 Identification of Baseline Conditions
 - 4.6.5 Impact Magnitude and Sensitivity Criteria
 - 4.6.6 Impact Assessment
 - 4.6.7 Cumulative Impact Assessment
 - 4.6.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
 - 4.6.9 Mitigation Measures
 - 4.6.10 Assumptions and/or Limitations
- 4.7 Noise, Vibration and Physical Impacts
 - 4.7.1 Introduction
 - 4.7.2 Policies, Legal Framework and Guidelines
 - 4.7.3 Extend of Study Area
 - 4.7.4 Identification of Baseline Conditions
 - 4.7.5 Impact Magnitude and Sensitivity Criteria
 - 4.7.6 Impact Assessment
 - 4.7.7 Cumulative Impact Assessment
 - 4.7.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
 - 4.7.9 Mitigation Measures
 - 4.7.10 Assumptions and/or Limitations
- 4.8 Biodiversity, Ecosystem Services and Living Natural Resources
 - 4.8.1 Introduction
 - 4.8.2 Policies, Legal Framework and Guidelines
 - 4.8.3 Extend of Study Area
 - 4.8.4 Identification of Baseline Conditions
 - 4.8.5 Impact Magnitude and Sensitivity Criteria
 - 4.8.6 Impact Assessment
 - 4.8.7 Cumulative Impact Assessment

- 4.8.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
- 4.8.9 Mitigation Measures
- 4.8.10 Assumptions and/or Limitations
- 4.9 Cultural Heritage and Archaeology
 - 4.9.1 Introduction
 - 4.9.2 Policies, Legal Framework and Guidelines
 - 4.9.3 Extend of Study Area
 - 4.9.4 Identification of Baseline Conditions
 - 4.9.5 Impact Magnitude and Sensitivity Criteria
 - 4.9.6 Impact Assessment
 - 4.9.7 Cumulative Impact Assessment
 - 4.9.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
 - 4.9.9 Mitigation Measures
 - 4.9.10 Assumptions and/or Limitations
- 4.10 Waste and Wastewater
 - 4.10.1 Introduction
 - 4.10.2 Policies, Legal Framework and Guidelines
 - 4.10.3 Extend of Study Area
 - 4.10.4 Identification of Baseline Conditions
 - 4.10.5 Impact Magnitude and Sensitivity Criteria
 - 4.10.6 Impact Assessment
 - 4.10.7 Cumulative Impact Assessment
 - 4.10.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
 - 4.10.9 Mitigation Measures
 - 4.10.10 Assumptions and/or Limitations
- 4.11 Traffic and Transport
 - 4.11.1 Introduction
 - 4.11.2 Policies, Legal Framework and Guidelines
 - 4.11.3 Extend of Study Area
 - 4.11.4 Identification of Baseline Conditions
 - 4.11.5 Impact Magnitude and Sensitivity Criteria
 - 4.11.6 Impact Assessment
 - 4.11.7 Cumulative Impact Assessment
 - 4.11.8 Summary of Residual Impacts, Significance Criteria and Overall Impact Significance
 - 4.11.9 Mitigation Measures

- 4.11.10 Assumptions and/or Limitations
- 4.12 Resources Efficiency and Pollution Prevention and Control
- 4.13 Occupational Health and Safety
- 4.14 Community Health and Safety
- 5. SOCIAL IMPACT ASSESSMENT
- 6. STAKEHOLDER ENGAGEMENT
- 7. ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM
- 8. ENVIRONMENTAL BENEFITS AND ENHANCEMENTS
- 9. SUMMARY OF POTENTIAL IMPACTS AND CONCLUSIONS
- 10. REFERENCES