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İZMIR BAYRAKLI INTEGRATED HEALTH CAMPUS PROJECT

Environmental and Social Assessment - Final

Submitted to:
İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş.

REPORT

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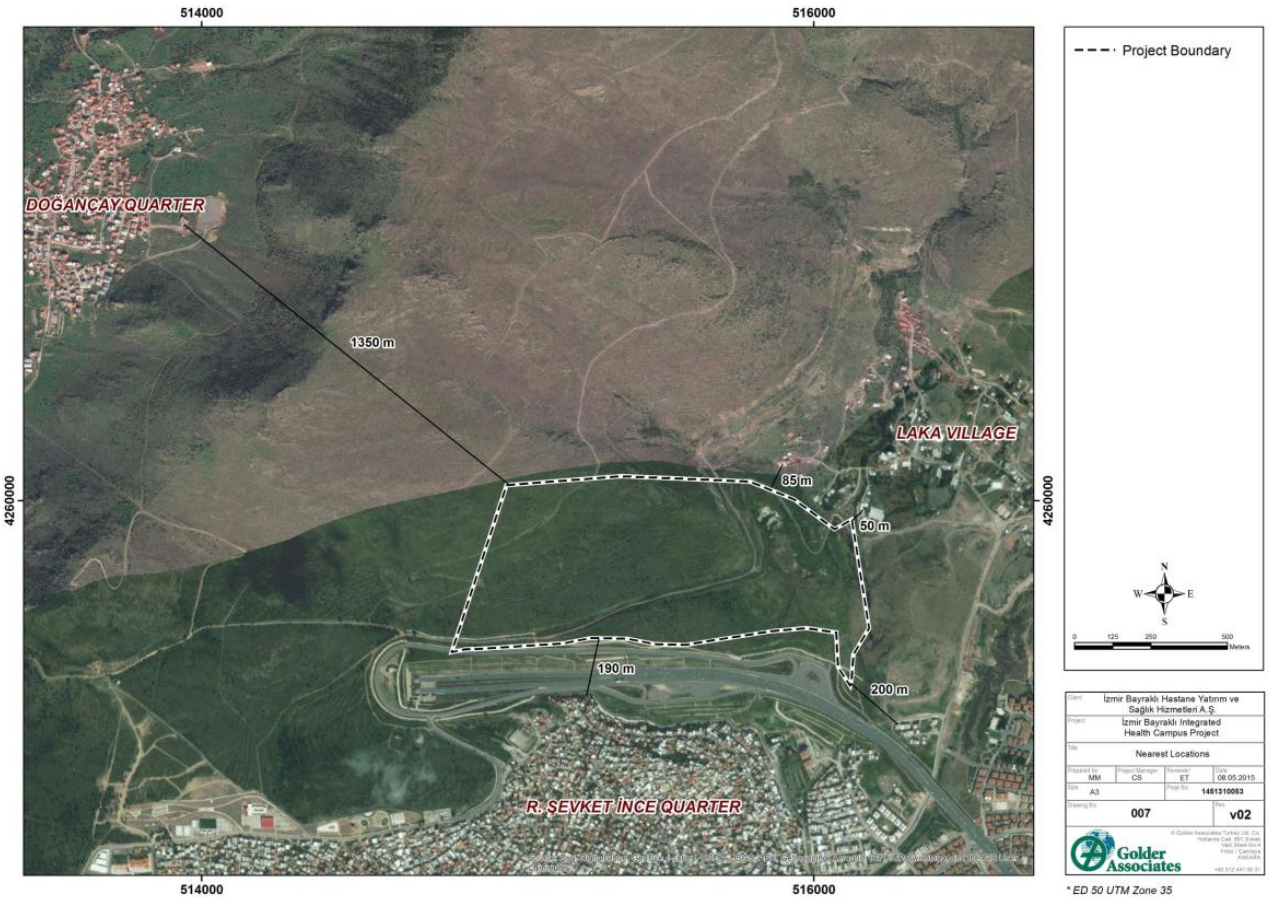
Executive Summary

Introduction

Health Services Transformation Program has been initiated by MoH in 2003 for with the purpose of extending the access to health services and increasing the number of health personnel per capita. Under the scope of this program 29 health regions were defined for 81 provinces. The aim for defining the health regions were to provide high quality health services to the citizens in these regions. The MoH is planning to build 30 health campuses with different bed capacities in 22 cities within this program.

Being one of these campuses, the purpose of the İzmir Bayraklı Integrated Health Campus Project (IHC) is to improve the quality of healthcare services and the number of beds by constructing a new healthcare facility in İzmir. When completed, the Project will provide high-quality healthcare services for the residents of İzmir and the surrounding settlements.

İzmir Bayraklı Integrated Health Campus Project is located in İzmir Province, Bayraklı District, near the Bayraklı Tunnels. Access to the Project Site is provided by the E87 (O-30) Highway, Bayraklı Exit. The Health campus area is a green field area and is the property of the Undersecretariat of Treasury and was allocated to the MoH upon designation as a "Health Campus Area"



Project Location and surroundings

Izmir Bayrakli Integrated Healthcare Campus will be constructed over a 622,530 m² land consisting of several hospitals with a total enclosed area of 573,546 m² and bed capacity of 2,060. The health campus is going to include 3 hospitals which are: the Main (General) Hospital, the Physical Therapy and Rehabilitation Hospital and the High Security Forensic Rehabilitation Hospital.

The findings of the scoping and screening phase of the Project and potential environmental and social impacts and risks of the projects were identified during that phase the project is categorised as B in accordance with IFC Sustainability Framework, EBRD Environmental and Social Policy and OPIC Environmental and Social Statement. Some of the findings are:

- There are no identified cultural heritage and biodiversity concerns within the Project Area of influence
- The Project is located in the vicinity of already existing infrastructure facilities
- The Project is away from the densely populated areas

Moreover, some of identified impacts and risks are: its being site specific, readily identifiable and largely reversible (see Section 1.3)

İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. retained Golder Associates Turkey Ltd. Şti. ("Golder") to prepare the Environmental and Social Impact Assessment ("ESA") for the İzmir Bayraklı Integrated Health Campus Project ("Project") in compliance with the national and international requirements.

Land use

The approximately 62.3 ha of the land where the Project will be realized is the property of the Undersecretariat of Treasury and was allocated to the MoH upon designation as a "Health Campus Area in the 1/5,000 scaled Master Plan. The MoH obtained consent from the former owner and the MoEU to use the site.

In the Project area the vegetation is characterized by low Mediterranean screlophillus shrubland (maquis) more or less heavily grazed and interrupted by many rock outcrops. There is no housing and no ongoing industrial or agricultural activity at the project site. There has been occasional grazing at the project site.

Environmental and Social Assessment

An ESA evaluates a project's potential environmental risks and impacts in its area of influence; examines project alternatives; and includes the process of mitigating and managing adverse environmental and social impacts throughout project implementation.

ESA takes into account the natural environment, community health and safety, and social aspects in an integrated way.

The overall objectives for an ESA will include:

- Identification and assessment of social and environmental impacts, both adverse and beneficial, in the Project's area of influence;
- Evaluation of the main environmental and social risks and potential impacts of the Project;
- Presentation of Environmental and Social Management Plan (ESMP), Environmental and Social Management System (ESMS), Stakeholder Engagement documentation, and Grievance Mechanism against the Applicable Standards;
- Description of the management, mitigation, monitoring and compensation measures, including the ESMS, the ESMP, and the thematic action or management plans (e.g. corrective action plan, resettlement action plan);
- Cumulative impact assessment;
- Assessment of associated facilities.

Environmental and Social Assessment as presented in this report was performed for key issues for each Environmental and Social component. The assessment methodology consists of five main steps:

- Identification of Project activities that could contribute to environmental or social change;
- Evaluation of the potential effects;
- Description of mitigations for significant potential effects;
- Analysis and characterization of residual effects; and
- As necessary, identification of monitoring to evaluate and track performance.

The ESA used the following tools and procedures to analyse and address potential effects: conditions;

- Predictive tools (calculations, models) and methods to quantitatively and qualitatively describe future environmental and socioeconomic conditions;
- Quantitative and qualitative information on the existing baseline environmental and socioeconomic of potential effects, including reference to management objectives, baseline conditions and the views of the proponent and stakeholders; and
- Characterization of potential residual effects after mitigation and their consequences for people and the environment.

Detailed information related to assessment methodology is defined in Appendix J and Section 1.4.

Assessment of Alternatives

No analyses of alternatives with respect to location have been performed. The project land where the Project will be realized is the property of the Treasury, and was allocated to the Ministry of Health upon designation as a "Health Campus Area in the 1/5,000 scaled Master Plan. The MoH obtained consent from the former owner and the MoEU to use the site

The designated location has advantages of being close to already developed areas with civil infrastructure and access possibilities from immediate or regional surroundings.

The Project will utilize highly advanced medical devices and facilities and will meet the health requirements of İzmir province and its nearby surroundings.

A portion of the power for the project during operation will be supplied through a trigeneration plant. The selected gas turbines for the trigenaration plant will be supporting the efficient use of energy resources for the project.

Stakeholder Engagement

A specific Stakeholder Engagement Plan has been prepared for the project. The overall objectives of the Stakeholder Engagement Plan are:

- Continuously informing the local community about the Project-related development activities;
- Ensuring that the local community is informed about the hazards associated with construction, operation activities of the Project and mitigation measures implemented to reduce impacts where possible;
- Minimizing potential disputes between Contractor's and Subcontractors' and the local community;
- Incorporating local knowledge during the entire Project life cycle, by taking into account bottom up information and feedback provided by local communities; and

- Timely and effectively responding to community concerns regarding the issues such as employment of the local workforce reserve in the construction and operation phases, disruption to daily activities, safety issues, disturbances due to noise or dust, and other environmental and social issues.

A Grievance Mechanism has been set up for communities and individuals to formally communicate their concerns, complaints and grievances to the company and facilitate resolutions that are mutually acceptable by the parties.

The identified project stakeholder categories are;

- Governmental authorities at the national, regional and local levels;
- Multi-national and international organizations (i.e. World Bank Group, EBRD, bilateral donors, etc.);
- Non-commercial, non-governmental and public organizations at the international, national, regional and local levels,
- Interest groups, such as universities and their foundations, cooperatives, local business establishments, business associations, chambers of commerce, hospitals, schools and others (i.e., labour, youth, religious, businesses, etc.);
- Local communities;
- Patients and patient families;
- Local businesses and potential Project contractors and suppliers;
- Project, contractor and subcontractor employees; and
- Media;
- Directly affected community members (living nearby the Project area, patients, hospital employees, visitors etc.)

The SEP is a working document that will be revised during the development of the Project.

A public consultation meeting was conducted in İzmir on 29th of May, 2015.

The main output of these activities can be summarised as;

- There is positive perception of the project being a public service infrastructure
- The project would benefit from improvement of existing transportation routes.
- Arrangements should be in place for minimising the social and environmental disturbance to nearby Laka Village during construction activities
- The project is expected to provide employment opportunity to the community members
- An increase in the real estate prices in Laka Village is expected

Public Consultation Meeting

Baseline Data Collection

As a key step in the ESA process; various studies have been conducted to collect information on the existing environmental and social baseline conditions. Apart from the desktop and relevant literature review the following activities were performed for the collection of social and environmental baseline data.

- For social baseline; qualitative baseline information was collected through key informant interviews, community level interviews and focus group discussions
- Air, soil and water quality measurement campaigns were conducted,
- Ambient noise measurements were done at selected points in the project area and surroundings
- Traffic count study was done on the possible approach routes to the project area.
- Site visit was performed for identification of biodiversity concerns
- It is expected that the regional groundwater level is deeper than 55 m. However; it is expected that localized perched groundwater and groundwater originating from fractures may be encountered at the Project Area during rainy seasons.

Baseline Data Collection Activities

IMPACT ASSESSMENT RESULTS

Main features of Current Situation	Potential impacts	Mitigation Measures
Geology and Seismology		
The project area is in 1st degree earthquake zone.	Changes in the local morphology due to the earthworks and excavation during construction. Impacts of seismologic activities on the facilities.	Compliance of design with the provisions of the "Regulation on the Buildings to be Constructed on Earthquake Zones" (06.03.2007 O.G. No: 26454).
Soils		
The project area is a green field and no contamination has been observed in the boundaries of the project area.	The top soil and lower soil removal. Occupation of land, increase of artificial land use and discharge of wastewater. Potential contamination of soil as a result of accidental spills, storage of hazardous material and waste at site.	Removed topsoil will be stored in an appropriate area in the Project Area, to be used for landscaping after the construction. Prevention of leaks and spills. Spill response arrangements.
Hydrogeology and Groundwater Quality		
It is expected that the regional groundwater level is deeper than 55 m. However; it is expected that localized perched groundwater and groundwater originating from fractures may be encountered at the Project	Hydrogeological change and potential groundwater pollution due to uncontrolled release of contaminants onto the ground.	Prevention of leaks and spills.

Main features of Current Situation	Potential impacts	Mitigation Measures
Area during rainy seasons.		
Hydrology and Surface Water Quality		
One small creek (Laka Creek) was observed within the Laka Village. The creek is 100 m of the Project Area. There is contamination observed in Laka Creek due to impacts from the anthropogenic and livestock activities.	Surface water pollution. Sediment pollution.	Engineering and design practices will be in place for the collection and disposal of wastewater from all sources during construction and operation of the project. The disposal of radioactive effluents during operation will be in line with the IFC/EBRD requirements defined for healthcare facilities.
Air Quality		
PM_{10}, settled dust and SO_2&NO_2 measurement values at and around project site comply with limit values from NO_2 values for two locations due to the heavy vehicular traffic on the stabilised road during the measurement period	Calculations on the estimated amount of air emissions during construction indicate no significant contribution to the ambient air quality. Air dispersion modelling shows that there will be only incremental addition of air pollutions to the ambient air quality pollutant levels.	Measures will be in place to minimise the air emissions during construction. Monitoring systems will be in place for the air emissions from the facility to be in compliance with regulatory requirements applicable to the project. A programme will be in place for the monitoring of NO_2 levels where the background NO_2 levels are in exceedance of limit values.
Noise		
During the baseline studies except at a few locations close to road traffic, the measured ambient noise levels were recorded to be in in compliant with the standards.	Noise modelling shows the construction activities will not create additional noise values higher than the regulatory limit. As compared to the construction phase model results, operation phase noise level in the surroundings will be much lower and no exceedances in relation applicable standards are expected for the ambient noise levels.	Engineering controls. Limited construction works during night and weekends.
Traffic		
The main existing access road that was assessed for the Project Site is the highway O-30 which runs along the south border, separating the Project	During construction phase impacts will be mainly associated with the increased road traffic.	Scheduling of traffic to avoid peak hours on local roads. Adopting best transport safety practices with the goal of preventing

Main features of Current Situation	Potential impacts	Mitigation Measures
area from the Bayraklı District. There is a service road which allows drivers to change the direction. The access to the Project would be from this service road..	The land traffic in the operation phase will be generated by the transportation of personnel, patients and visitors to Bayraklı IHC.	traffic accidents and minimizing injuries suffered by project personnel and the public. Adopting traffic control and operations devices and emphasizing safety aspects among project drivers. Regular maintenance of vehicles should be undertaken to ensure that vehicles are safe and emissions and noise are minimized.
Biological Components		
No Critically Endangered (CR) and/or Endangered (EN) endemic and/or restricted-range species (IFC 2012) were observed in the area.	The presence of the facilities will cause a loss of potential habitat for flora and fauna species within the project footprint during operation.	Project footprint will be minimized to the smallest extent possible in order to meet and support the Project works and activities. Inadvertent disturbance to the adjacent vegetated areas will be avoided through clear demarcation of the Project Site boundaries.
Social Components		
The project site is bounded by two settlement areas with different demographic and socioeconomics characteristics. Bayraklı District is a highly populated urban area whereas Laka – Village is a less populated area with rural characteristics The main economic activity in Bayraklı District is trading and small sized business whereas the main economic activity in Laka Village is agriculture and husbandry. Unemployment is specified as a concern at the interviews conducted with stakeholders during site data collection activities.	*The need of workforce that can be considered a positive impact. **Increased traffic and transportation requirements. ***Community health and safety concerns in relation to Project construction and operation.	***A continuous stakeholder engagement process and grievance mechanism will be in place • to exchange information on the project with the local community and other stakeholder and • to record and respond any complaints and concerns raised by the local community members and other stakeholders *Maximising of local employment and procurement in order to increase the positive socio-economic impact of the project on the local community. ***Coordination with the local community for the arrangements of accommodation and establishment of the construction camps.

Main features of Current Situation	Potential impacts	Mitigation Measures
There is not an educational or health services facility in the direct impact area of the project. Though public transportation network is fairly developed in İzmir and Bayraklı direct access to Laka village is only by bus. Other infrastructure; electricity network, communication, water and wastewater is available in Laka Village There is already a management system for the disposal of medical wastes in İzmir. No movable or immovable cultural assets have been identified within the project area.		**, ***Cooperation with local authorities and local community members on minimising the potential negative impacts of the project on animal husbandry in Laka village through measures such as but not limited to; • not disturbing the access routes of the buyers of food of animal origin to Laka Village • locating construction camp away from animal feedstock barns; • scheduling and planning of construction activities in such a way that nuisance to the animal feedstock is minimised ; ***Local waste management authorities will be contacted to ensure the allocation of existing municipality resources and structures for the construction waste management. **A detailed traffic study will be performed to identify the best transportation routes with minimum impact on the existing traffic load and suggesting measures to improve the accessibility to Bayraklı IHC during operation. ***Coordination with the local authorities to confirm the utilisation of existing medical waste disposal facility for the operational medical wastes.

Environmental and Social Management System

The Environmental and Social Management System (ESMS) is required to ensure that the Project:

- complies with all applicable Turkish legislation as well as relevant IFI guidelines provided in the ESA;
- implements Good International Industry Practices (GIIP) to minimize potential environmental and social impacts during the construction, operation and decommissioning phases;

- is executed in compliance with the commitments addressed in the ESA for the minimization of potential environmental and social impacts;
- works in accordance with high standards of safety;
- cares for the protection of own employees and public;
- promotes its policies through training, supervision, regular reviews and consultation;
- generate local socio-economic benefits by using local and regional labour forces;
- engages and communicates with the local community and other stakeholders through a stakeholder engagement programme.

The minimum requirements of an ESMS have been defined in order to mitigate the risks associated with;

- Environmental aspects
- Labour Issues
- Community Health & Safety aspects
- Stakeholder management and social aspects
- Provision of healthcare services
- Waste Management
- Operation of Forensic Hospital
- Patient Data Security
- Dual management of the Facility

The basic framework of ESMS has been described in this study for the general management issues and ESMS will be further developed as the project progresses.

Conclusion

As a result of the Environmental and Social Impact Assessment Study the following conclusions have been driven:

1) A detailed traffic study is required to identify the best transportation routes with minimum impact on the existing traffic load.

2) Stay in contact with local authorities to provide input on any future planning of the road and transportation in line with the developments in the area and maximize the benefit from future transportation network developments in the region.

3) The community health and safety concerns are valid especially in relation to the Forensic Hospital. Continuous liaison is necessary with the local community members to manage the associated risks.

4) Continuous stakeholder engagement is necessary to manage the social risks of the project.

5)

6) The project will develop an Environmental and Social Management System in line with the minimum requirements that are defined as part of the ESA study.

ACRNYMS AND ABBREVIATIONS

µg	Microgram
AoI	Area of Influence
CCHP	Combined Cooling Heat and Power
CO	Carbon monoxide
CO_2	Carbon dioxide
CRA	Community Relation Assistant
CRO	Community Relation Officer
dBA	A-weighted decibels
DPSIR	Drivers-Pressures-State-Impact-Response
EA	Environmental Assessment
EBRD	European Bank for Reconstruction and Development
EEA	European Environmental Agency
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EPA	Environmental Protection Agency
EPFI	Equator Principles Financial Institutions
EPs	Equator Principles
ER	Environmental Representative
ESAP	Environmental and Social Action Plan
ESA	Environmental and Social Assessment
ESHS	Environmental Social Health and Safety
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EU	European Union
GHGs	Greenhouse gases
GIIP	Good International Industry Practice
Golder	Golder Associates Turkey Ltd. Şti
GPLV	Generic Pollutant Limit Value
ha	Hectar
HCF	Healthcare Facilities
HP	Horse Power

hPa	Hecto Pascal
hr	Hour
HSE	Health, Safety and Environment
IBA	Important Bird area
ICU	Intensive Care Units
IFC	International Finance Corporation
IUCN	International Union for Conservation of Nature
IZKA	İzmir Kalınma Ajansı
IZTO	İzmir Ticaret Odası
KBA	key biodiversity area
kg	Kilogram
kVA	Kilovolt Ampere
L	Liter
L&FS	Life and Fire Safety
L&FS	Life and Fire Safety
LDRP	Labour, Delivery, Recovery and Past-partum
Leq	Equivalent continuous sound level
LSA	Local Study Area
LV	Low voltage
m	Meter
mg	Milligram
ml	Milliliter
mm	Millimeter
MoEU	Ministry of Environment and Urbanization
MoH	Ministry of Health
MoJ	Ministry of Justice
MTA	Directorate of Mineral Research and Exploration
MV	Medium voltage
NGOs	Non-governmental organizations
NICU	New-born Intensive Care
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides
O.G.	Official Gazette
OECD	Organization for Economic Co-operation and Development

PDF	Project Description File
PDoEU	Provincial Directorate of Environment and Urbanization
PM	Particulate matter
PM_{10}	Particulate matter with diameter less than or equal to 10 micron
PPE	Personal Protective Equipment
PPP	Public Private Partnership
PRs	Performance Requirements
PS	Performance Standard
QA/QC	Quality Assurance/Quality Control
RSA	Regional Study Area
s	Second
SA	Study Area
SO_2	Sulfur dioxide
SPV	Special Purpose Vehicle
SSA	Social Study Area
ToC	Table of Contents
TOX	Total organic halogens
TPH	Total petroleum hydrocarbons
TÜİK	Türkiye İstatistik Kurumu (Turkish Statistical Institute)
VEC	Valued environmental components
WHO	World Health Organization

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1.0 INTRODUCTION

1.1 Background and objectives

İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. ("Client"), retained Golder Associates Turkey Ltd. Şti. ("Golder") to prepare the Environmental and Social Assessment ("ESA") for the İzmir Bayraklı Integrated Health Campus Project ("Project") in compliance with the national and international requirements.

İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. is a subsidiary of Gama-Türkerler and GE Joint Venture which is called "SPV".

This document represents the ESA report for the İzmir Bayraklı Integrated Health Campus Project. Before the preparation of this document a separate Scoping document was prepared in April 2015.

The Project is legally exempt from the requirement of an official Environmental Impact Assessment ("EIA") Process. However, in Turkey concrete plant(s) with the capacity of 100 m^3/hr and above and Trigeneration plant with the power capacity of 20 MWt and higher, are subject to the preparation of Project Description File ("PDF") in accordance with the Regulation on Environmental Impact Assessment (dated: November 25, 2014, Official Gazette No: 29186, Annex – II Article 18 and Article 44 of the Regulation, respectively).

A Trigeneration plant will be installed as part of the Project to produce part of the power required for the operation of the facilities. The capacity of the unit will be 4 MWt (thermal power). During the operation phase there will be boiler operation combusting natural gas to produce heat for the consumption of the project facilities. The total capacity of the boilers will be 11.2 MWt (thermal power). . The capacity is lower than the aforementioned criteria stated in the Regulation on Environmental Impact Assessment. Hence the Project is not subject to the preparation of PDF in relation to the Trigeneration Plant.

There will not be concrete plant constructed under the scope of the Project. Needed concrete will be supplied from external concrete batching plants which are located close to the site, however there is a also possibilty to construct a concrete batching plant with 90 m3/h capacity which in that case; there will not be requirement for preparing a single PDF.

If in the future during the construction works a requirement arises to increase the capacity of the concrete batching plant which will exceed 100 m3/hr , referring to the aforementioned Turkish EIA criteria, preparation of a single PDF will be necessary

Although the overall Project is legally exempt from the requirement of an official EIA Process, an ESA study, which will be based on the latest design data in accordance with the pertinent international regulations and guidelines including a comprehensive assessment of certain environmental and social issues, is required by the International Finance Institutions which are EBRD, OPIC and EDC.

The İzmir Bayraklı Integrated Health Campus Project ("IHC") is based on a Public - Private Partnership ("PPP") investment-finance model. The construction period (investment) is 3 years, whereas the operation will last for about 25 years. After 25 years of operation IHC will be transferred to the MoH. There will be a dual management system between the Ministry of Health ("MoH") and the Project Company in the campus. Under this system, The MoH will assign doctors, nurses and other clinical staff to the campus.

In the feasibility study conducted by the MoH, there is no information on the closure and capacity decrease of other hospitals located in İzmir An official response has been requested from MoH on the potential closure or capacity decrease of other hospitals.

The objectives of the ESA report are:

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

- Presentation of Environmental and Social Management Plan (ESMP), Environmental and Social Management System (ESMS), Stakeholder Engagement documentation, and grievance mechanism against the Applicable Standards;
- Description of the management, mitigation, monitoring and compensation measures, including the ESMS, the ESMP, and the thematic action or management plans (e.g. corrective action plan, resettlement action plan);
- Cumulative impact assessment (as required by the Applicable Standards);
- Assessment of associated facilities.

Main components of the assessment include:

- the potential environmental and social impacts of the Project throughout the full life cycle;
- a public consultation to ensure that local communities and other key stakeholders are informed of the Project and have an opportunity to express their opinions concerning the Project;
- proposed mitigation activities to minimize adverse environmental impacts;
- the nature and significance of residual impacts (those adverse impacts that occur after mitigation has been applied) and ongoing monitoring and management plans to address them;
- the nature and significance of cumulative impacts.

1.2 Project Rationale

The purpose of the İzmir Bayraklı Integrated Health Campus Project is to improve the quality of healthcare services and the number of beds by constructing a new healthcare facility in İzmir. When completed, the Project will provide high-quality healthcare services for the residents of İzmir and the surrounding settlements.

Health Services Transformation Program has been initiated by MoH in 2003 with the purpose of extending the access to health services and increasing the number of health personnel per capita. Under the scope of this program 29 health regions were defined for 81 provinces. The aim for defining the health regions was to provide high quality health services to the citizens in these regions. The MoH is planning to build 30 health campuses with different bed capacities in 22 cities within this program[1].

İzmir has two Health Regions (20th and 21st Health Regions of Turkey), and the Project is in the 20th Health Region of Turkey which covers northern part of the İzmir, Manisa and Uşak provinces. İzmir is defined as a centre of the region because of the current health personnel number, health facilities, health services capacities, better transportation possibilities and the higher population.

The population of Izmir, according to the census carried out by the Turkish Statistical Institute in 2014 is 4,113,072. The universities in Izmir also attract many students and contribute to an increase of the population. Given an increasing population and the requirements for higher quality of services, new healthcare facilities are needed in İzmir.

Due to the increasing population of the İzmir Province, the need for healthcare services has increased. The present hospital infrastructure in the Province is relatively old and has not been recently upgraded. For example, the Urla State Hospital was built in 1958. It is not possible to expand the present hospital beds capacity since the hospital facilities are located in the central areas of the city with lack of adjacent building space, insufficient car parking capacity and green areas.

[1] MoH, Planning Guide for Facilities Providing Inpatient Healthcare, June 2011

Izmir is the centre for health services for the neighbouring towns while the city provides healthcare for other provinces, as well. According to health data of the Turkish Statistical Institute for 2013, there are 59 hospitals in total in the Izmir Province. Of these, 29 hospitals are Ministerial, meaning that they are administered by the MoH, 4 are university hospitals, 24 are private hospitals, 90 are emergency service units (112) and 1138 are family practice centres. The total bed capacity in the İzmir province is 11,361. Of these, 6,188 of these beds are in the Ministerial hospitals. It is, thus recognized that a major part of the healthcare services is provided by the public sector. When the numbers are compared with the European Union ("EU") countries and EU-candidate countries, Turkey has the lowest number of beds per 10,000 inhabitants. Nevertheless, the bed capacity per 10,000 inhabitants has increased over the years; however this number does not meet the EU requirements (See Figure 2)

In order to close this gap and in the light of above discussion, existing health facilities in İzmir are inadequate for providing health care services, hence facilities located in less crowded part of the city, and providing higher quality services are necessary and new investments for healthcare facilities are needed. (see Figure 1).

After the implementation of the planned projects, the current bed capacity of the MoH will increase from 847 to 2,055 and the bed capacity ratio of İzmir province will become 30 beds for 10,000 individuals.

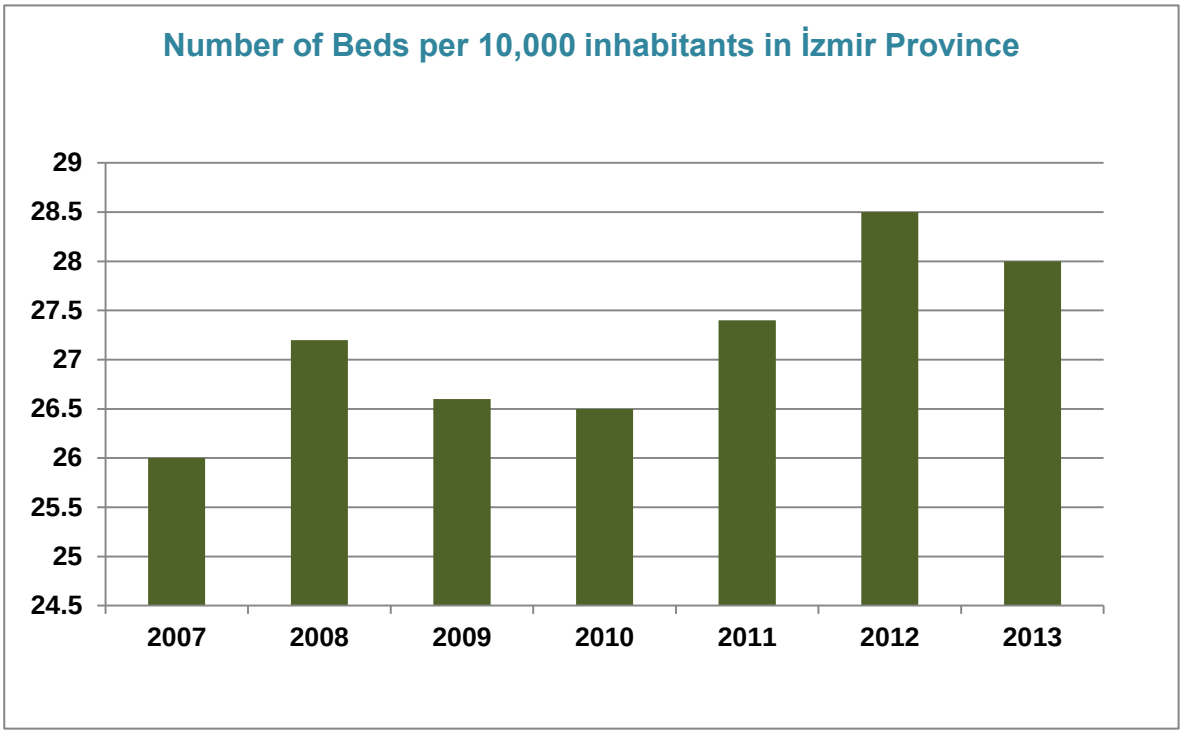


Figure 1: Number of Beds per 10,000 People in İzmir Province (2007-2013)[2]

[2] Turkish Statistical Institute, 2015

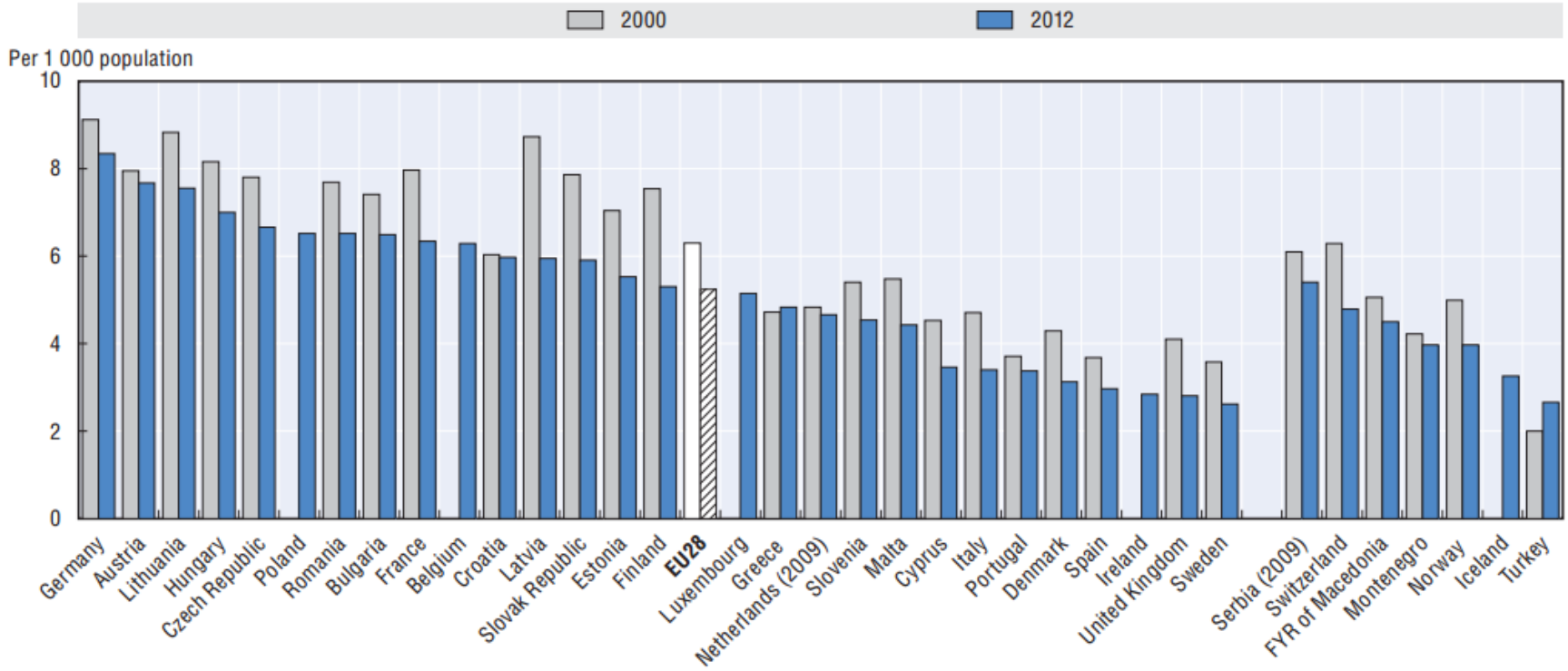


Figure 2: Hospital Beds in EU countries and EU-candidate countries per 1,000 population between the years 2000 and 2012 (if 2012 data is not available, the latest available data is considered)[3]

[3] OECD Health Statistics 2014, http://dx.doi.org/10.1787/health-data-en; Eurostat Statistics Database; WHO Europe Health for All Database

The portion of number of beds in the intensive care units ("ICU") in the total the number of beds in the hospitals in İzmir Province is close to the 7% declared by the MoH for Turkey. However this number is not sufficient for İzmir which is a coastal town with heavy marine traffic and itinerant people (sailors, tourists, etc.). The nearby provinces have rather high ICU bed occupancy rate, as well.

While the average occupancy rate of the beds across all the hospitals in the İzmir Province is 57.4%, the average occupancy rates for several health care facilities and the peak occupancy rates for the province, in general, are much higher. For example, the Menemen State Hospital had an average occupancy rate of 99.24% in 2009 while İzmir Tepecik Training Research Hospital reached 80.37% in 2009 (see Table 1). The increase in the occupancy rate of the beds clearly indicates the need for additional beds and implicitly new facilities.

Table 1: Bed Occupancy Rate (%) in the Hospitals in İzmir Province[4]

	Bed Occupancy Rates (%)	
	2009	**2010**[(a)]
İzmir Aliağa State Hospital	46.32	67.87
İzmir Çeşme Alper Çizgenakat State Hospital	23.27	29.4
İzmir Alsancak Nevvar Salih İşgören State Hospital	51.91	57.39
İzmir Atatürk Training and Research Hospital	83.53	81.28
İzmir Bayındır State Hospital	53.26	66.01
İzmir Bornova Türkan Özilhan State Hospital	73.05	46.37
İzmir Bozyaka Training and Research Hospital	76.15	73.89
İzmir Buca Maternity and Pediatric Hospital	14.19	52.59
İzmir Buca Seyfi Demirsoy State Hospital	61.48	55.58
İzmir Çiğli State Hospital	68.73	57.89
İzmir Dr.Behçet Uz Pediatric Surgery Training and Research Hospital	66.34	65.82
İzmir Dr.E.Hayri Üstündağ Gynecology and Obstetrics Hospital	43.68	57.68
İzmir Bergama Dr.Faruk İlker State Hospital	39.78	43.16
İzmir Dr.Suat Seren Pulmonary Diseases and Pulmonary Surgery Training and Research Center	76.63	79.25
İzmir Ege Maternity and Gynecology Training and Research Hospital	66.47	63.59
İzmir Foça State Hospital	28.3	43
İzmir Karşıyaka State Hospital	56.78	65
İzmir Kiraz State Hospital	39.15	56.41
İzmir Torbalı M.Enver Şenerdem State Hospital	61.19	66.83
İzmir Menemen State Hospital	99.24	85.16
İzmir Seferihisar Nejat Hepkon State Hospital	46.94	43.07
İzmir Ödemiş State Hospital	49.28	49.64
İzmir Selçuk State Hospital	39.64	66.42
İzmir Tepecik Training and Research Hospital	80.37	92.06
İzmir Tire State Hospital	62.51	71.99
İzmir Urla State Hospital	54.81	67.48
(a) Values are referred to the first 3 months of 2010		

[4] Ministry of Health Website http://www.saglik.gov.tr/TR/belge/1-10633/saglik-bolge-planlamasi-hakkinda-genelge-ile-hastane-ya-.html

According to the personnel distribution table obtained from the Provincial Directorate of Health, which indicates the staff quotas needed by the healthcare organizations, there is a need for nurses and midwives at the health facilities in the İzmir Province. The World Health Organization ("WHO") emphasises that the number of health workers is important in reducing the infant and maternal mortality. While the number of health workers is sufficient for existing medical centres in accordance with the personnel distribution table, the new medical centres are required to employ new health workers.

Some health indicators for İzmir province according to the Health Statistics Yearbook - 2013 of the MoH are given in Table 2 and Table 3.

Table 2: Number of Health Personnel in İzmir Province[5]

	Number of Personnel
Specialist Physician	5,688
Practitioner	2,149
Physician Assistant	1,907
Total Number of Physicians	9,744
Dentist	1,549
Pharmacist	1,874
Nurse	8,491
Midwife	2,713
Other Health Personnel	7,562

Table 3: Health Indicators for İzmir Province[6]

	İzmir
Number of Hospitals	59
Number of Beds	11,361
Number of Beds per 10,000 people	28
Qualified Bed Number	4,253
Number of Beds in ICU	1,512
Number of Family Practice Centre	1,138
Population per Family Doctor	3,569
Number of Emergency Service Units (112)	90
Population per Emergency Service Units	45,123
Number of Ambulances (112)	114
Population per ambulance	35,623

According to the 2009 data on haemodialysis patients and treatment facilities across the province, 2,998 patients were treated. Of these 358 patients were treated at dialysis centres of the MoH; 2517 were treated in private hospitals; and 123 in university hospitals. There was an average of 3.3 patients per dialysis machine in the Izmir Province. According to the European Renal Association and European Society of Nephrology, for effective and beneficial treatment, patients should take dialyses 3 days per week, each session lasting 4 hours. As a result, the maximum patient number per machine should be 5. It can, thus, be concluded that the 3.3 average for the province of Izmir is a good rate.

[5] Health Statistics Yearbook, 2013, Ministry of Health

[6] Health Statistics Yearbook, 2013, Ministry of Health

When the above issues are considered, it is obvious that the İzmir Bayraklı Integrated Health Campus Project will be supporting in :

- decreasing the patient load of existing public hospitals;
- increasing the efficiency and quality of health services;
- achieving the adequate quantity and higher quality of patient beds and;
- providing the region with comprehensive healthcare services.

1.3 Project categorisation

The requirements from IFC, EBRD and OPIC regarding the Environmental and Social Assessment process and outcomes differ depending on the category of the project. Projects are categorized as follows:

Table 4: Project Categorisation

Category	Description of the Project		
	IFC	**EBRD**	**OPIC**
Category A	Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented	Project that could result in potentially significant adverse future environmental and/or social impacts which, at the time of categorisation, cannot readily be identified or assessed, and which, therefore, require a formalised and participatory environmental and social impact assessment process.	Project that are likely to have significant adverse environmental and/or social impacts that are irreversible, sensitive, diverse, or unprecedented.
Category B	Projects with potential limited adverse environmental and social risks and/or impacts those are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures.	Projects with potential adverse future environmental and/or social impacts that are typically site-specific, and/or readily identified and addressed through mitigation measures.	Project that are likely to have limited adverse environmental and/or social impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures.

With the findings of the scoping/screening phase of the Project it can be concluded that:

- There are no identified cultural heritage and biodiversity concerns within the direct Project Area of Influence.
- The Izmir Project is located in the vicinity of already existing public infrastructure including traffic infrastructure and hazardous/medical waste handling facilities.
- The Izmir Project is away from densely populated areas.
- The Project land is a greenfield, owned by the Turkish Under-secretariat of Treasury and has been allocated specifically to this project.
- The Izmir Project will not result in closure of any other health service facilities in the province of Izmir or elsewhere.

The potential environmental and social impacts and risks of the projects were identified based on the project screening information presented in the scoping report and the additional information collected during the scoping phase. These impacts and risks are:

- Site specific,
- Readily identifiable and
- Can be readily addressed by standard industry practice mitigation measures (as also detailed in the following sections).
- Largely reversible

Thus, the project is determined to be category B.

1.4 Key steps in the ESA process

1.4.1 Screening & Scoping

Golder prepared a Scoping Report in April 2015 for the Project. The purpose of the Scoping Report was to identify the key environmental and social issues associated with the Project and requiring detailed evaluation as part of the ESA process, to establish the most appropriate approach to the assessment and the categorisation of the project.

The Scoping Report was based on the review of the characteristics of the Project and the associated releases to the environment and a walkover survey of the site and of the surrounding area carried out in March 2015. Major potential environmental and social issues associated with the Project are identified together with the requirement for additional studies on specific issues during that phase. Some further potential impacts, as some of them have been identified after the scoping stage, during the ESA process are considered in detail, specific studies are performed (such as primary baseline data collection modelling and consultation) and all potential impacts are reported in the individual assessment sections.

1.4.2 Baseline data collection

Baseline information has been obtained from the Project specific social and environmental baseline studies that have been carried out as part of this ESA, utilising both desktop and field-based approaches. These studies have been compiled through specifically commissioned surveys, collated from a range of sources including publicly available information and through consultation. Relevant information used to support the assessment process is referenced in the relevant sections.

1.4.3 Stakeholders engagement

EBRD and IFC recommend that the project sponsor consults with the relevant stakeholders at least twice:

a) during scoping and before the terms of reference for the ESA are finalized, and

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

As part of the scoping phase, preliminary engagement activities during the site visit were performed, whereas additional consultations with local people have been implemented during the ESA process.

Detailed information is provided about the Stakeholder Engagement in Section 6.0 of this report.

1.4.4 Impact assessment

Impact assessment was performed for main issues for each Environmental and Social component (discipline). The common impact assessment methodology consists of five main steps:

- identification of Project activities that could contribute to environmental or social change;

- evaluation of the potential effects;
- description of mitigations for potential effects;
- analysis and characterization of **residual effects**; and
- as necessary, identification of monitoring to evaluate and track performance.

The general methodology adopted by Golder for Environmental and Social Impact Assessment Studies is consistent with the **DPSIR framework** (Drivers-Pressures-State-Impact-Response) developed by the European Environmental Agency ("EEA"). The methodology has been designed to be highly transparent and allow a semi-quantitative analysis of the impacts on the various environmental and social components.

1.4.5 Identification of mitigation measures

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

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

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

1.4.6 Uncertainties

This ESA is prepared based on the Project information provided by the Client (refer to Section 4.0). Like most ESAs, the current ESA faced a number of challenges in terms of retrieving baseline information, the level of accuracy of predicting impacts, and developing appropriate mitigation. Furthermore, even with a firm Project design and an unchanging environment, predictions are by definition uncertain.

In order to facilitate decision-making, then areas of uncertainty, data gaps and deficiencies, during further stages of Project development have been highlighted within the ESA report. In order to address the uncertainties, monitoring will be undertaken by the Client to understand whether the identified mitigation measures are sufficient or there is a need for any refinements.

1.4.7 Study Limitations

The ESA is depending on the available and convenient information provided by the SPV.

With regard to the environmental and social baseline data collection; there has been no significant limitations in relation to the site surveys and literature studies.

Regarding to the project description contents, there has been some limitations connected with the MoH. Before beginning of the ESA studies, correspondences were sent by SPV to the MoH on information requests to the closure of the existing hospitals in that region. However, those information requests have not yet been responded.

1.4.8 Environmental and Social Management System

The general framework for the environmental and social management system to be developed and implemented by the Project through the project lifecycle has been defined in Section 10.0.

1.4.9 Environmental and Social Action Plan

The Environmental and Social Action Plan (ESAP) has included APPENDIX N.

1.5 Outline of the ESA report

This document is the ESA report for İzmir Bayraklı Integrated Health Campus Project in compliance with the national and international requirements.

- This document presents the following sections:
- Introduction (Section 1),
- Guidelines and Procedures according to EBRD and IFC (Section 2),
- Regulatory and Policy Framework (Section 3),
- Project Description (Section 4),
- Analysis of Alternatives (Section 5),
- Stakeholder Engagement (Section 6),
- Impact Screening and Definition of the Valued Environmental and Social Components (Section 7),
- Environmental and Socio-Economic Baseline (Section 8),
- Impact Assessment (Section 9),
- Environmental and Social Management System (Section 10),
- Environmental and Social Action Plan (Section 11) and
- Conclusions (Section 12).

2.0 GUIDELINES AND PROCEDURES ACCORDING TO EBRD AND IFC

The present ESA has been structured in accordance with the Performance Requirements (“PR”) of EBRD, Performance Standards (“PS”) of IFC.

The IFC Performance Standards and EBRD Performance Requirements that are triggered by the project summarised in the below table with reference to the chapter where the compliance with these requirements are assessed.

Table 5: Compliance Table Summary

Theme/Sub-Theme	EBRD PRs	IFC PSs	Addressed in Chapter
Environmental and social assessment Take into account all applicable laws and regulations to the project including the laws implementing host country obligations under international law	PR 1	PS 1	3-Regulatory and Policy Framework
Environmental and social assessment/ Examination of technically and financially feasible	PR 1	PS 1	5- Alternatives Assessment

Theme/Sub-Theme	EBRD PRs	IFC PSs	Addressed in Chapter
alternatives, including the non-project alternative			
Environmental and social assessment/ Document the rationale for selecting the alternative	PR 1	PS 1	5- Alternatives Assessment
Resource efficiency/ Identify opportunities and alternatives for resource efficiency relating to the project in accordance with GIP	PR 3	PS 3	5- Alternatives Assessment
Stakeholder Engagement Stakeholder engagement is conducted to provide local communities that are directly affected by the project and other relevant stakeholders.	P10	PS 1	6-Stakeholder Engagement
Stakeholder Engagement Stakeholders are identified, stakeholder engagement plan is prepared, consultation meeting is conducted, and grievance mechanism is described.	PR 10	PS 1	6-Stakeholder Engagement
Environmental and social assessment/ Consider the potential risks and impacts of the project based on current information, including an accurate project description (all components) and appropriate baseline data	PR 1	PS 1	7- Impact Assessment Methodology
Environmental and social assessment/ The assessment process covers direct and indirect environmental and social issues	PR 1	PS 1	7- Impact Assessment Methodology
Identification of Risks and Impacts Environmental and social risks and impacts is identified in the context of the project's area of influence.	PR 1	PS 1	7- Impact Assessment Methodology
Environmental and social assessment/ Consider the potential risks and impacts of the project based on current information, including an accurate project description (all components) and appropriate baseline data	PR 1	PS 1	8-Environmental and Social Baseline
Environmental and social assessment/ Consider the potential risks and impacts of the project based on current information, including an accurate project description (all components) and appropriate baseline data	PR 1	PS 1	9- Impact Assessment
Environmental and social assessment/ The assessment process covers direct and indirect environmental and social issues	PR 1	PS 1	9- Impact Assessment
Identification of Risks and Impacts Environmental and social risks and impacts are identified in the context of the project's area of influence.	PR 1	PS 1	9- Impact Assessment
Mitigation Define mitigation measures in line with mitigation	PR1	PS 1	9- Impact Assessment

Theme/Sub-Theme	EBRD PRs	IFC PSs	Addressed in Chapter
hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment.			
Biodiversity Conservation Identify and characterise, the potential direct and indirect project-related risks and impacts on biodiversity.	PR 6	PS 6	9- Impact Assessment
Land Acquisition and Involuntary Resettlement and Economic Displacement Avoid or minimize physical and/or economic displacement, when displacement cannot be avoided, displaced communities and persons will be offered compensation	PR5	PS5	9- Impact Assessment
Environmental and Social Policy/ Establish and manage mitigation and performance improvement measures and actions that address the risks and impacts	PR 1	PS 1	10-Environmental and Social Management System
Organisational capacity and commitment/ Establish, maintain and strengthen an organizational structure that defines roles, responsibilities and authority	PR 1	PS 1	10-Environmental and Social Management System
Organisational capacity and commitment/ Designate specific personnel, including management representatives with clear lines of responsibility and authority	PR 1	PS 1	10-Environmental and Social Management System
Community Health and Safety Risks and adverse impacts to the health and safety of the potentially affected communities are identified and assessed and protection, prevention and mitigation measures are defined	PR 4	PS4	10-Environmental and Social Management System
Labour and Working Conditions Minimum standards are defined for ensuring labour and working conditions to be in compliance with project requirements	PR2	PS2	10-Environmental and Social Management System
Occupational Health and Safety Minimum standards are defined for ensuring occupational health and safety to be in compliance with project requirements	PR2	PS2	10-Environmental and Social Management System
Health Services Consider the impacts on employees, patients and the immediate community	Sub-sectoral Environmental and Social Guidelines: Health Services and Clinical Waste Disposal	Environmental, Health, and Safety Guidelines; HEALTH CARE FACILITIES	10-Environmental and Social Management System
Cumulative Impacts Cumulative impacts of the project are considered	PR 1	PS 1	11-Cumulative Impact

Theme/Sub-Theme	EBRD PRs	IFC PSs	Addressed in Chapter
during impact assessment process in combination with impacts from other past, existing and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the project that may occur later or at a different location.			Assessment
Cumulative Impacts Potential adverse project impacts on existing ambient conditions are addressed The project-related impacts and issues associated with resource use, and the generation of waste and emissions are assessed in the context of project location and local environmental conditions	PR 3	PS 3	11-Cumulative Impact Assessment

In order to support the reader in the analytical process, a self-explanatory and systematic tool for addressing the relevant requirements or standards is reported. This tool is proposed as a Conformance Table at the beginning of each main section of the ESA and is meant to communicate essential information about the ESA compliances to stakeholders and authority in an efficient, easy-to-read format.

The Conformance Table contains the short description of the themes discussed in the related section and specific PRs and PSs that address the Equator Principles. A case in point is shown in the following:

Conformance Table – [Reference Section to the ESA]		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Release of pollutants	PR 3	PS 3
Identification of potential hazards to workers	PR 2	PS 2
[…]		

3.0 REGULATORY AND POLICY FRAMEWORK

Conformance Table – Regulatory and Policy Framework		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Environmental and social assessment Take into account all applicable laws and regulations to the project including the laws implementing host country obligations under international law	PR 1	PS 1

A Trigeneration plant will be installed as a part of the Project to produce part of the power required for the operation of the facilities. The capacity of the unit will be 4 MWt (thermal power). During the operation phase there will be boiler operation combusting natural gas to produce heat for the consumption of the project facilities. The total capacity of the boilers will be 11.2 MWt (thermal power). There will be 5 boilers. According to this, the total capacity will be 15.2 MWt (11.2 + 4) which is below 20 MW. The capacity is lower than the

aforementioned criteria stated in the Regulation on Environmental Impact Assessment. Hence the project is not subject to the preparation of PDF for the Trigeneration Plant.

There will not be concrete plant constructed under the scope of the Project. Needed concrete will be supplied from external concrete batching plants which are located close to the site, however there is a also possibilty to construct a concrete batching plant with 90 m3/h capacity which in that case; there will not be requirement for preparing a single PDF.

If in the future during the construction works a requirement arises to increase the capacity of the concrete batching plant which will exceed 100 m3/hr , referring to the aforementioned Turkish EIA criteria, preparation of a single PDF will be necessary

Hospitals and healthcare facilities having capacity higher than 20 beds are included in Annex- 2 and the trigeneration plants having capacity more than 1 MW thermal power are included in Annex-2 of the Regulation on Environmental Permits and Licenses (dated: September 10, 2014, Official Gazette No: 29115). Hence, Environmental Permit for operation phase will be received from the Ministry of Environment and Urbanization (“MoEU”).

The regulatory framework for the project is composed of the applicable requirements of :

- Current National Environmental and Social Legislation
- International Conventions and Agreements
- Current European Union Environmental and Social legislation
- Requirements of Equator Principles

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

- EBRD Performance Requirements

  The 2014 Environmental and Social Policy of the EBRD is a document which details the commitments of the agreement establishing the Bank particularly for the "promotion of environmentally sound and sustainable development”. These Performance requirements include;

  - PR1 - Assessment and management of environmental and social impacts and issues
  - PR2 - Labour and working condition
  - PR3 - Resource efficiency, pollution prevention and control
  - PR4 – Health and safety
  - PR5 - Land acquisition, involuntary resettlement and economic displacement
  - PR6 - Biodiversity conservation and sustainable management of living resources
  - PR7 - Indigenous peoples
  - PR8 - Cultural heritage
  - PR9 - Financial intermediaries
  - PR10 - Information disclosure and stakeholder engagement

- IFC Standards and Guidelines

IFC 2012 Performance Standards (IFC 2012 PS) have been considered the main reference as they are the most recent environmental and social standards issued by an International Financial Institution. IFC 2012 PS comprises 8 documents:

- Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
- Performance Standard 2: Labour and Working Conditions
- Performance Standard 3: Resource Efficiency and Pollution Prevention
- Performance Standard 4: Community Health, Safety, and Security
- Performance Standard 5: Land Acquisition and Involuntary Resettlement
- Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- Performance Standard 7: Indigenous Peoples
- Performance Standard 8: Cultural Heritage

- IFC EHS Guidelines

The Environmental, Health, and Safety ("EHS") Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice ("GIIP"). The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

- IFC EHS Guidelines for Healthcare Facilities
  - Workers' accommodation: processes and standards Public guidance note by IFC and the EBRD, 2009
  - Sub-sectoral Environmental and Social Guidelines: Health Services and Clinical Waste Disposal, 2009
- EIB Requirements

The 2013 Environmental and Social Practices handbook of the EIB is a document which provides advice on planning and managing the environmental and social appraisal and monitoring. It describes the steps for determining the scope of the environmental and social review process throughout the project cycle that the EIB shall carry out for all projects in all regions. It also explains the role of highly specialised units or individuals who collectively ensure that the Bank's activities respond to the highest possible standards.

4.0 PROJECT DESCRIPTION

4.1 Project Area

4.1.1 Project Location

İzmir Bayraklı Integrated Health Campus Project is located in İzmir Province, Bayraklı District, near the Bayraklı Tunnels. Access to the Project Site is provided by the E87 (O-30) Highway, Bayraklı Exit.

İzmir province is surrounded by the Balıkesir, Manisa and Aydın Provinces. İzmir has the highest population among the other provinces in the Aegean Region of Turkey.

Bayraklı District is surrounded by the Karşıyaka and Bornova districts.

The Project Site is located between the slopes of the Küçükkalete Mound, southeast of the Doğançay Quarter and the Laka Stream. The O-30 highway borders the south of the Project Site. The Baltali Stream is located west and the Laka Stream is located east of the Project Site.

The nearest residential area to the Project Site is the Laka village which is 50 m from the site. R. Şevket İnce quarter is approximately 190 m from the Project Area across the E87 highway. The Doğançay Quarter is located approximately 1640 m northwest of the Project Area.

The nearest protected area (Spil Mountain Natural Park) are located more than 20 km north-east of the project site (air distance). The main sources of living at the Laka village (the nearest settlement) are agriculture and livestock.

The Project Area is notably steep with slopes over 22%. The Project Area has a trapezoidal shape and a very sharp elevation difference (190 m) between the lowest point (127 m) in its south-eastern corner and the highest (317 m) in its north-western corner. There would be rain water runoff flowing along the slope direction. It is planned to excavate during the construction the entire Project Area to depths varying between 0.45 m to 37.14 m.

4.1.2 Land use

The approximately 62.3 ha of the land where the Project will be realized is the property of the Undersecretariat of Treasury and was allocated to the MoH upon designation as a "Health Campus Area" in the "1/5,000-scaled Master Plan. The MoH obtained consent from the former owner and the MoEU to use the site. MoH transferred the right of construction of the land to the SPV at 06.03.2014.

In the Project area the vegetation is characterized by low Mediterranean screlophillus shrubland (maquis) more or less heavily grazed and interrupted by many rock outcrops.

There is no housing and no ongoing industrial or agricultural activity at the project site.

The Google Earth view of the project site and layout of the project are given in Figure 3 and Figure 4. The Site Photographs are provided in the Appendix B.

Figure 3: Google Earth View of the Project Area

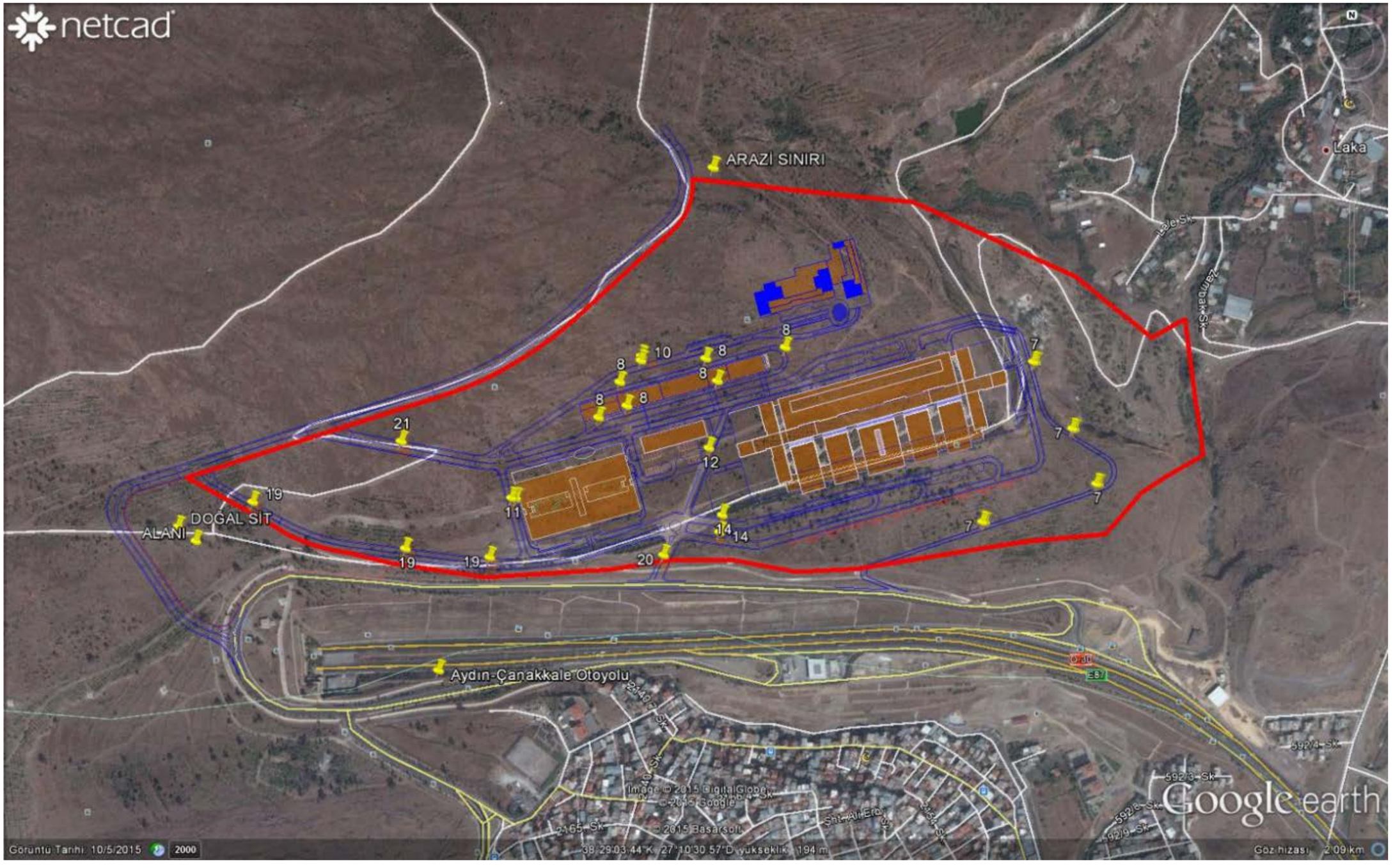


Figure 4: Preliminary Site Layout of İzmir Bayraklı Integrated Health Campus Project

4.2 Project components

Izmir Bayrakli Integrated Healthcare Campus will be constructed over a 622,530 m² land consisting of several hospitals with a total enclosed area of 573,546 m² and bed capacity of 2,060. The health campus is going to include 3 hospitals which are: the Main (General) Hospital, the Physical Therapy and Rehabilitation Hospital and the High Security Forensic Rehabilitation Hospital. The Main Hospital also includes a General Hospital, a Women & Paediatrics Hospital, the Cardiovascular Hospital and an Oncology Hospital. The bed capacities and the closed construction areas of each hospital unit above are given in

Table 6 and Table 7. Table 8 shows the car parking capacity of the main hospitals.

Table 6: Bed Capacity of the İzmir Bayraklı Integrated Health Campus based on project information available at this stage

Hospital	Bed Capacity
Main Hospital	
General Hospital	715
Women & Paediatric Hospital	424
Cardiovascular Hospital	380
Oncology Hospital	141
Physical Therapy and Rehabilitation Hospital	300
High Security Forensic Rehabilitation Hospital	100
Total Number of Beds	**2,060**

Table 7: Closed Construction Areas (m2) of Project Components based on project information available at this stage

Project Component	Closed Construction Areas (m^2)
Main Hospital	433,009
Main Hospital Diagnostics and Beds	283,609
Main Hospital Closed Car parks	149,400
Physical Therapy and Rehabilitation Hospital	94,423
Rehabilitation Hospital Diagnostics and Beds	76,423
Rehabilitation Hospital Closed Car parks	18,000
High Security Forensic Rehabilitation Hospital	23,347
Forensic Rehabilitation Hospital Diagnostics and Beds	20,347
Forensic Rehabilitation Hospital Closed Car parks	3,000
Technical Services Building	22,768
TOTAL CLOSED CONSTRUCTION AREA	**573,547**
TOTAL AREA OF LAND	**622,530**

Table 8: Car Parking Lots

Hospital	Car Parking Lots
Main Hospital	4,980
Physical Therapy and Rehabilitation Hospital	300
High Security Forensic Rehabilitation Hospital	100
Total Car Parking Capacity	**5,380**

The Project, which will have 573,547 m^2 closed area, will meet the health requirements of İzmir province and its nearby provinces. When the new Campus starts to operate at full capacity, it is predicted to provide

healthcare services to an estimated 12,000 people (polyclinics and emergency) per day in modern conditions .

The following facilities are going to be present in İzmir Bayraklı Integrated Health Campus:

Main Hospital Units	General Hospital Units	Cardiovascular Hospital Units	Women and Paediatrics Hospital Units	Oncology Hospital Units	Forensic Hospital Units	Rehabilitation Hospital Units
16 Cardio Intensive Care (ICU) 7 Iodine Treatment 15 Burn 40 Surgery 4 Angiography 12 Angiography Pre/Post Operation 40 Surgery Pre Operation 80 Surgery Post Operation 40 Emergency Observation 5 Emergency Observation Private 12 Emergency Women and Paediatrics Observation, 12 Emergency Women and Paediatrics Treatment 8 Emergency	528 ACUTE7 72 ICU 20 SUITE8 12 Transplant 10 Trauma 96 Clinics	308 ACUT 36 ICU 20 SUIT 96 Clinics	264 ACUT 54 ICU 20 SUIT 16 Labour, Delivery, Recovery and Past-partum (“LDRP”) 70 New-born Intensive Care (“NICU”) 96 Clinics	88 ACUT 36 ICU 20 SUIT 96 Clinics	100 ACUT	300 ACUT 40 Clinics

[8] Private hospital rooms

[8] Private hospital rooms

Main Hospital Units	General Hospital Units	Cardiovascular Hospital Units	Women and Paediatrics Hospital Units	Oncology Hospital Units	Forensic Hospital Units	Rehabilitation Hospital Units
Green Code Exam 10 Triage 12 Emergency Trauma 20 Emergency Yellow Code Exam 2 Emergency Yellow Code Isolation Rooms 24 Haemodialysis Centre 20 Chemotherapy 8 Day Surgery 48 Prison Service						

4.2.1 Trigeneration Plant

The Project is to produce part of its own power through a Trigeneration plant. The capacity of the unit will be 4 MWt (thermal power). During the operation phase there will be boiler operation combusting natural gas to produce heat for the consumption of the project facilities. The total capacity of the boilers will be 11.2 MWt (thermal power). The remaining electricity shall be obtained from the national electricity grid. As it is to be a Trigeneration plant, the wasted energy from the production of electricity shall be recaptured and used to supply some of the both the heating and cooling needs of the Project during the operational phase. The remaining heating needs will be met through the use of boilers.

The emissions from the Trigeneration plant will comply with the Turkish, EU and IFC requirements.

The Trigeneration system is to use natural gas supplied by the city network. In case of shortage, generators and boilers will be fed by diesel tanks that will be located on site. It is envisaged that the fuel tanks will be located next to both technical buildings. The total amount of stored diesel will be designed to suffice the IHC's needs for three days. The exact location and arrangement of the diesel storage tanks is still to be confirmed. These tanks will be attached to the backup generators.

The Proposed Design for the proposed system generates simultaneously Power and Thermal (Hot Water/Steam and Chilled Water) based on a topping cycle. In a topping cycle, energy from the fuel generates shaft or electric power first, and thermal energy from exiting stream is recovered for other applications, in this case steam, hot water and chilled water production.

It is envisaged that the Combined Cooling Heat and Power ("CCHP") system consists of as follows:

- Prime Mover: The prime Movers are reciprocating spark ignition engines, fuelled by natural gas.
- Electricity-Generating System: The electricity generating system consists of generators (alternator system) that are coupled to the prime movers, transformers coupled to a generator to convert low voltage (LV) to a medium voltage (MV), and circuit breakers and switches to stop the flow of current when there is a fault and to turn on or off the electrical current.
- Heat Recovery System: The heat recovery system is subdivided into two systems:
  - Exhaust Gas System: Heat from engine exhaust gas is partially salvaged by using a heat recovery silencer. This heat is used to produce steam.
  - Cooling System: Engines have two cooling systems, one at low temperature and another at high temperature. Heat from the high-temperature cooling system can be salvaged to produce hot water.
- Chilled Water Production System: By Absorption Water Chiller Plants, the system produces chilled water. The absorption plants use the steam produce for the Exhaust Gas System as heat supply.

4.3 Construction phase

The construction period (investment) of the İzmir Bayraklı Integrated Health Campus Project is planned to be 3 years.

It is predicted that approximately 4000 people will be employed during the construction of the health campus at peak times (see below graphic).

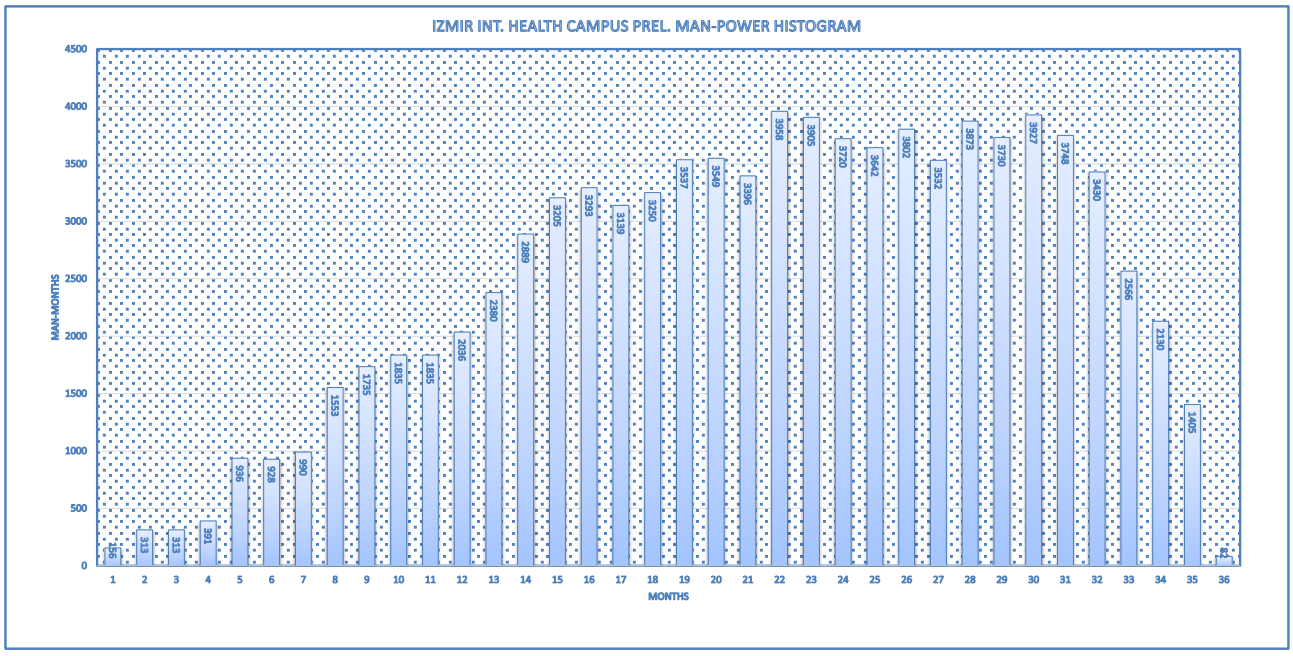


Figure 5: Preliminary Man-Power Histogram

The amount of estimated soil to be excavated during the construction is given in Table 9. The soil to be excavated will be disposed of to appropriate disposal sites. The assessment of these disposal sites is presented in section 5.2.3.

Table 9: Estimated Excavation Quantities (m3)

	Excavation Quantities (m^3)
Main Hospital	1,770,524
Rehabilitation Hospital	453,878
Forensic Hospital	334,106
Technical Buildings	25,897
Pedestrian Area and Roads etc.	118,774
TOTAL	**2,703,180**

90% of the excavated material is planned to be used at the site for refilling.

The construction equipment will possibly use diesel fuel which would lead to the emission of particulate matter (PM_{10}), oxides of nitrogen (NO_x) and sulphur dioxide (SO_2). Construction traffic may also lead to a temporary increase in local air pollutants in the area surrounding the construction activities.

Land transport to the construction site will be through the E87 (O-30). The existing connection road need to be maintained and/or short distance new access roads may need to be constructed to ensure the access of equipment and vehicles to site. There will be service roads inside the project area. This roads will be planned as much as possible to be used as during operation phase in order to reduce the excavation waste.

There will be a construction camp to be established for construction workers. The accommodation blocks will not include kitchen, laundry and social areas. There will be individual block for these services.

4.4 Operation phase

The number of the administration personnel planned for the operation phase of the İzmir Bayraklı Integrated Health Campus Project is estimated to be 3629 in light of the existing information available at this stage. The details of the employment are given in Table 10 below. There will 355 specialist physicians and practitioners, 780 nurses and midwifes, and 340 auxiliary health personnel. The MoH will be the responsible party for the recruitment and management of health employees.

There is going to be a designated management system at the campus where the MoH will assign special health staff to the campus, while the Ministry of Justice (“MoJ”) will only be responsible for the section of the forensic hospital where prisoners with mental problems will be accommodated.

Forensic Hospital

The operation of forensic hospital needs specific engineering design and management considerations to mitigate potential environmental and social risks such as: community health and safety risks associated the accommodation of the prisoners with mental problems, management system challenges; the Ministry of Justice (“MoJ”) will only be responsible for the section of the forensic hospital where prisoners with mental problems will be accommodated, management of security systems and services and treatment of prisoners with mental problems. In order to mitigate these risks the following measures will be in place:

- There will be security systems to eliminate the unauthorized entry and exit to the premises of the hospital.
- There will be a stakeholder engagement and grievance mechanism system in place to ensure the information exchange between the community members in the neighbourhood, record and respond the concerns of these people.

- There will be communication mechanisms in place with community heads. The emergency response plan will include informing them in case of a security breech at the hospital.
- The hospital will be designed to accommodate 100 patients with mental problems. The hospital design will ensure the patient welfare and the security by allocating separate clinics for different gender types, open-air areas for patients and personnel, security provisions in line with security zoning, ensuring patient privacy when deciding on surveillance system design and similar.
- There will be close coordination and communication among Bayraklı IHC management, Ministry of Health, Ministry of Justice and Ministry of Interior for the operation of forensic hospital and provision of security forces

The Regulation on the Associationf of Private Hospitals (dated: 27.03.2002, Official Gazette No: 24708) is taken into consideration during the operation of forensic hospital.

Table 10: Estimated Number of Personnel to be employed during the Operation Phase

	Number of Personnel
Laundry	39
Cafeteria	225
Laboratory	76
Imaging	153
Sterilization	33
Rehabilitation	167
Waste Management	11
Cleaning- Room Cleaning	645
Hospital Information Management System (HBYS)	78
Security	235
Patient Guidance	301
Other Medical Support Services	25
Building and Land Services	64
Common Services	22
Furnishing	11
Garden Care Services	31
Disinfection	9
Parking Lot	34
Specialist physicians and practitioners	355
Nurses and midwives	780
Auxiliary health personnel	340
TOTAL	**3629**

4.5 Waste Management

The details of the waste management are presented in Appendix B. Summary of specific items are given in the following sections.

4.5.1 Water Use and Wastewater

The water supply for construction activities will be from municipality network. Maximum daily amount of water to be used will be 525 m^3/day.

The primary and the only source of water for operation phase consumption will be the municipality network. In the case of groundwater consumption the water physico-chemical and microbiological quality will be ensured to be in line with national and WHO (World Health Organization) standards through appropriate treatment and monitoring.

The domestic wastewater during construction will be collected by the municipality sewage network. Maximum daily amount of domestic wastewater will be approximately 525 m^3/day (assuming worst case of; the supplied amount of water is converted to wastewater at a ratio of 1/1).

During operation phase, wastewater from departments will be collected via different piping systems and discharged directly into the municipality sewer system, except for the wastewater that is contaminated with radioactive substances (i.e. from nuclear medicine department) which will be collected separately and/or subject to neutralization prior to being discharged into the sewer system. It is important to note that several conditions are set for liquid wastes contaminated with radioactive substances in the Regulation on Wastes Generated upon Usage of Radioactive Substances (OG date/no: 02.09.2004/25571) related to discharging this type of wastewater into the sewer system.

4.5.2 Medical Wastes

Medical wastes are the most important type of wastes which will be created during the operation of the project. Medical wastes are classified into three main groups according to the Regulation for Medical Waste Control:

- Infectious waste
- Sharps
- Pathologic waste

The main strategy of waste management of medical wastes is to separate all medical wastes from other hazardous wastes (such as chemical wastes or radioactive wastes) and non-hazardous general waste. However, to provide a minimum level of safety to staff and patients, each type of medical wastes would be collected separately. Waste management methods used for each type of medical waste in operation phase of the project is summarized below:

Table 11 Medical Waste Management Methods of the Hospital Project[9]

Type of Medical Waste	Contents	Segregation Options	Disposal Options
Infectious Waste	Includes waste suspected to contain pathogens (e.g. bacteria, viruses, parasites, or fungi) in sufficient concentration or quantity to cause disease in susceptible hosts. Includes pathological and anatomical material (e.g. issues, organs, body parts, human fetuses, animal carcasses, blood, and other body fluids), clothes, dressings, equipment / instruments, and other items that may have come into contact with infectious materials.	Yellow or red coloured bag / container, marked “infectious” with international infectious symbol. Strong, leak proof plastic bag, or container capable of being autoclaved	Bayraklı Belediyesi and/or licensed medical waste sterilization/disposal plants

[9] IFC EHS Guidelines for Health Care Facilities, 2007

Type of Medical Waste	Contents	Segregation Options	Disposal Options
Sharps	Includes needles, scalpels, blades, knives, infusion sets, saws, broken glass, and nails etc.	Yellow or red colour code, marked “Sharps”. Rigid, impermeable, puncture-proof container (e.g. steel or hard plastic) with cover. Sharps containers should be placed in a sealed, yellow bag labelled “infectious waste”	İzmir Municipality and/or licensed medical waste sterilization/disposal plants
Pharmaceutical Waste	Includes expired, unused, spoiled, and contaminated pharmaceutical products, drugs, vaccines, and sera that are no longer needed, including containers and other potentially contaminated materials (e.g. drug bottles vials, tubing etc.).	Brown bag / container. Leak-proof plastic bag or container.	İzmir Municipality and/or licensed medical waste sterilization/disposal plants

Main points in medical waste management activities are given in APPENDIX B. A detailed Waste Management Plan will be prepared in the operation phase of the project, which specifies separate collection and storage, equipment and vehicles used in waste storage and transportation activities, waste types and quantities, frequency of collection, temporary storage systems, cleaning and disinfection of collecting equipment, measures and actions during accidents, responsible staff etc., according to the Regulation on Control of Medical Wastes.

4.6 General Facility Design Issues

The design of the health care facility will ensure the following general principles are followed;

- Provision of adequate separation of clean/sterilized and dirty/contaminated materials and people flows
- Provision of adequate disinfection/sterilization procedures and facilities
- Provision of adequate space for the storage of recyclable materials (e.g., cardboard and plastic) for pickup
- Provision of ventilation and air conditioning systems that provide isolation and protection from airborne infections
- Water system is designed to provide adequate supplies of potable water to reduce risks of exposure to *Legionella* and other water borne pathogens
- Provision of adequate hazardous materials and waste storage and handling areas
- Provision of treatment and exhaust systems for hazardous and infectious agents

- Use of easily cleaned building materials that do not support microbial growth, are slip-resistant, non-toxic and non-allergenic and that do not include VOC-emitting paints and sealants

Waste Management

Health care waste management system will be in place that includes the following elements:

- Source reduction measures (e.g., product/material substitution to avoid products containing hazardous materials that require products to be disposed as hazardous wastes; use of physical rather than chemical practices where such practices do not affect disinfection or patient safety)
- Waste toxicity reduction measures (e.g., product/material substitution for equipment containing mercury, PVCs, VOCs, PBT compounds and products that contain substances known to be carcinogenic, mutagenic or teratogenic)
- Use of efficient stock management practices and monitoring (for chemical and pharmaceutical stocks)
- Safe equipment re-use procedures (e.g., reuse of sharps following sterilization and disinfection)
- Adequate waste segregation strategies that specifically address mercury, cadmium, thallium, arsenic and lead; biomedical wastes, and aerosol cans and PVCs (to avoid disposal via incineration, if incineration will be used)
- Adequate on-site handling transport and storage procedures that specifically address limits on storage periods, mercury, cytotoxic waste and radioactive waste.
- Dangerous goods transport guidelines, including adequacy of packaging, labelling and transport vehicles
- Treatment and disposal technologies for infectious wastes, sharps, pharmaceutical wastes, genotoxic/cytotoxic wastes, chemical wastes, radioactive wastes, wastes with high concentrations of heavy metals, pressurized containers and general health care wastes (e.g., food wastes, paper, plastics)
- The details of the waste management plan is presented in Appendix B.

Air Emissions

- Control measures will be in place for exhaust gases from HVAC systems and fugitive emissions from waste storage areas, medical research areas and isolation wards

Wastewater

- There will be procedures and mechanisms for separate collection of urine, faeces, blood and vomit from patients treated with genotoxic drugs
- There will be prevention of large quantities of pharmaceuticals, and all antibiotics and cytotoxic drugs from discharge to municipal sewer systems
- There will be engineered controls for removal of pharmaceutical active ingredients

4.7 Occupational Health and Safety

Following occupational health and safety measures will be included in the design and panning of the facility;

- Exposure control plan for blood borne pathogens
- Staff and visitors informed on infections control policies and procedures

- Immunize staff, as necessary
- Use and adequate supplies of gloves, masks, gowns and other personal protection gear
- Adequate facilities for hand washing
- Procedures and facilities for handling contaminated laundry
- Adequate sharp management procedures
- Policies regarding animals on the property
- Procedures to reduce exposure to waste anaesthetic gases
- Comprehensive plan for reducing exposure to radiation
- Adequate fire and life safety measures, including smoke alarms and sprinkler systems, training in evacuation procedures, and fire prevention, emergency response and evacuation plans
- Occupational health and safety related to personnel of forensic hospital unit.

4.8 Accreditation

The project will obtain an accreditation based on a quality evaluation of the technical competence of the institution's resources and organization by an internationally recognized accreditation organization (such as Joint Commission International.

4.9 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and since the future use of the Project site and the surrounding areas is unknown, it is not possible to discuss the details of the decommissioning activities at the closure phase. Once closure timing and the objectives are clearer, decommissioning can be addressed. After 25 years of operation, the IHC will be transferred to the MoH.

In general, the decommissioning activities would comprise the removal of the plants and the associated facilities. Also the foundations of the structures would be removed. The impacts during decommissioning phase are likely to be similar to the construction phase. The description of the decommissioning/closure phase would include:

- Duration
- Personnel employed during decommissioning/closure (number of people and timeline for presence on site)

The details of this information are not available at this stage of the project. These details will be available and used for the preparation of the ESA report.

5.0 ANALYSIS OF ALTERNATIVES

Conformance Table - Analysis of Alternatives		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Environmental and social assessment/ Examination of technically and financially feasible alternatives,	PR 1	PS 1

Conformance Table - Analysis of Alternatives		
including the non-project alternative		
Environmental and social assessment/ Document the rationale for selecting the alternative	PR 1	PS 1
Resource efficiency/ Identify opportunities and alternatives for resource efficiency relating to the project in accordance with GIP	PR 3	PS 3

The Project is planned to achieve compliance with the regulatory requirements and Health Services Transformation Program has been initiated by Turkish MoH in 2003. For the purpose of analysis of alternatives for the project is assessed focusing on the following topics:

- No-project option
- Technological selection
- Location selection

5.1 No project option

The “No project option” implies that Project will not be realized (i.e. the no go alternative) no construction activities will occur and therefore there will be no positive and negative environmental and social risks connected to the Project. Furthermore no socio-economic benefits would accrue to the nearby communities and the government.

The positive local, regional and national socio-economic effects of the Project will occur over a long period of 25 years (operations), with the potential to extend benefits past that time due to Project improvements. Planning has emphasized integration of the Project with the nearby communities and Authorities, with mutual benefits for all parties.

The Project was planned to meet the demand in terms of health facilities and beds availability. A development activity in an area inevitably involves its alteration from the environmental point of view. However, to manage this alteration, an analysis of the Project also considered all the socio-economic elements in question in addition to ensuring the maximum protection of environment by use of latest, state-of-the-art technologies.

Failure to implement the proposed Project would involve the following:

- loss of opportunity to increase bed capacity and provision of health services with better quality in the project area;
- loss of opportunity to create direct employment for hundreds of workers, including health workers and non-health workers;
- loss of opportunity to create a new investment for the health care system
- failure to rationalize the use of health facilities in the project area.

Expanding the patient demands by extending the existing hospital facilities may as well be an option however would have the following limitations and risks:

- existing facilities are in the populated areas with limited capacity of land extension
- existing facilities would need refurbishment in addition to extension

- during the extension of the existing facilities there may be disruptions to the health services provided to the patients
- there is no forensic hospital at the current condition in İzmir and surroundings

5.2 Technological selection

5.2.1 Medical Services and Technologies

The Project will utilize highly advanced medical devices and facilities and will meet the health requirements of İzmir province and its nearby provinces. When the new Campus starts to operate at full capacity, it is predicted to provide healthcare services to an estimated 12,000 people (polyclinics and emergency) per day in modern conditions with 355 specialist physicians and practitioners, 780 nurses and midwifes, and 340 auxiliary health personnel.

Example of relevant high-tech devices and technologies chosen are listed in Section 4.0.

5.2.2 Energy Efficiency

The technology chosen for the Project is to produce part of its own power through a Trigeneration plant. The capacity of the unit will be 4 MWt (thermal power). During the operation phase there will be boiler operation combusting natural gas to produce heat for the consumption of the project facilities. The total capacity of the boilers will be 11.2 MWt (thermal power). There will be 5 boilers. According to this, the total capacity will be 15.2 MWt (11.2 + 4) Traditional gas turbines typically operate at an efficiency of 35% whereas trigeneration systems operate up to 85% by converting 45% of the source energy to electricity, 40% to heating and cooling.

The remaining electricity shall be obtained from the national electricity grid. As it is to be a Trigeneration plant, the wasted energy from the production of electricity shall be recaptured and used to supply some of the both the heating and cooling needs of the Project during the operational phase. The remaining heating needs will be met through the use of boilers.

In addition the in-design planning has incorporated the design of a system generating simultaneously Power and Thermal (Hot Water/Steam and Chilled Water) based on a topping cycle instead of alternative thermodynamic cycles.

The energy technologies selected as described above will guarantee increased efficiency throughout the Project life by recovering productions.

5.2.3 Soil disposal during construction

Alternatives analyses have been conducted for the site selection of disposal of excavated material.[10]

There are three disposal locations for excavated materials in İzmir. These are;

- Yelki Excavated Material Storage Area (50 km from the Project area),
- Gökdere Excavated Material Storage Area (15 km from the Project area),
- Belkahve Excavated Material Storage Area (16 km from the Project area),

[10] It is planned to use the excavated soil as much as possible for refilling. Current planning foresee to reuse 90% of the excvataed soil for refilling purpuses at site and send 10% to potentail dumping sites.

Gökdere and Belkahve excavated material storage areas were identified as suitable for disposal of excavated material, with other areas ruled out on the basis of potential environmental impacts (e.g. interference with natural habitats). These areas were assessed based on a number of criteria including distance, availability of dumping volumes, traffic and infrastructure facilities. The assessment identified that Gökdere and Belkahve are the best option due to the closeness and availability. This choice will result in a lower impact on the surrounding area (i.e., reduction of noise and air emissions to the receptors) and reduced transport movements across the area, leading to a lower impact on the local transport movements.

5.3 Location selection

No analyses of alternatives with respect to location have been performed. As a matter of fact should be considered that approximately about 62.3 ha of the land where the Project will be realized is the property of the Treasury, and was allocated to the Ministry of Health upon designation as a "Health Campus Area" in the "1/5,000-scaled Master Plan.

The MoH obtained consent from the former owner and the Ministry of Environment and Forestry to use the site.

For such a large urban development, there is a need for a large piece of land at or close to the city centre, yet site alternatives within the city are insufficient in İzmir. The Project Site is advantageous in that respect that is also away from the crowded parts of the city. This site is considered further advantageous due to the fact that it is located in a developed area close to existing urban infrastructures such as transportation and waste handling.

The project is located in the north of the City in Bayraklı District nears the Bayraklı Tunnels in an area with a topographic structure based on hills. The plot limited to the site by the O-30 (E87) highway which articulates to the City. The air distances of the site planned for the Health Campus to some of the Main transport centres are as follow,

- İzmir Bus Terminal 6.70 km
- Basmane Gar Station 7.20 km
- İzmir Adnan Menderes Airport 21.50 km

There are, in fact, no sites which is owned by the State and planned to be a Health Campus within İzmir that are large enough to hold such a facility, owned by the public and close enough to the city to be relevant. Thus, no other alternative sites have been evaluated for this Project.

6.0 STAKEHOLDER ENGAGEMENT

Conformance Table - Stakeholder Engagement

Theme/Sub-Theme	EBRD PRs	IFC PSs
Stakeholder Engagement Stakeholder engagement is conducted to provide local communities that are directly affected by the project and other relevant stakeholders.	P10	PS 1
Stakeholder Engagement Stakeholders are identified, stakeholder engagement plan is prepared, consultation meeting is conducted, grievance mechanism is described.	PR 10	PS 1

6.1 Stakeholder engagement plan

Detailed information on the Stakeholder Engagement process is provided in Appendix E.

6.2 Stakeholder management activities realised

During the baseline data collection activities for Bayraklı IHC following local authorities have been contacted to request various information on the Project Area and exiting baseline conditions.

- Ministry of Health, Health Investments Directorate
- İzmir Environment and Urbanisation Provincial Directorate, Protection of Natural Resources Department
- Ministry of Culture and Tourism, İzmir Regional Directorate of Protection of Cultural Heritage

Considering the social context and the nature of the project and in addition to the secondary data the qualitative primary baseline information has been collected at district and village/quarter level by using four different means of site data collection. During the socioeconomic baseline data collection following engagement activities were conducted with the project stakeholders between 7th and 11th of April, 2015

Key informant interviews with various stakeholders;

Interviews have been performed with the following groups of stakeholder using a customized in-depth questionnaires. (See APPENDIX C)

Bayraklı Municipality Environmental Protection Directorate

- Bayraklı Municipality Development Directorate
- Bayraklı District Health Directorate
- İzmir Greater Municipality Development General Secretariat
- Northern Hospital Association

In-depth interviews focused on economic activities

In depth interviews have been carried out with stakeholders engaged with economical activities in the local study area..

The stakeholders contacted in Laka Village are;

- Husbandry owners
- Shop owners
- Workshop owner

Community level interviews with village people,

Information on the socioeconomic status at local study area has been collected through interviews with the following local stakeholders using community level questionnaires

- Laka Village Mukhtar
- Osmangazi Village Mukhtar
- Osmangazi Village Mukhtar
- Laka Village Council Member
- Laka Village Religious Head
- Head of Laka Municipality Sports and Cooperation Association

During the interviews the concerns of the stakeholders on the potential impacts of the project have also been collected.

Focus groups.

Focus group meetings where the attending stakeholder can interactively engage to the meeting, have also been conducted with the following groups. (See questionnaire for focus group discussions.(See APPENDIX C):

- Laka Village women
- Laka Village men
- Bayrakli City Council

Engagement with the project sponsor

SPV has been requested through a filling a specific questionnaire to provide information on the recruitment policy and the social and environmental management plans to be prepared to minimize the impacts of the project.

A Public Consultation Meeting has been conducted in İzmir on 29th of May, 2015 at Laka Coffehouse. This place was easily accessible by the local people and communities. Announcements were made for the meeting in the areas, which were most likely to be affected by the Project and public notices with agenda, date, and time of the meeting was announced. Photos of the meeting are shown in Appendix F.

The number of the participation to the meeting was sufficient. In general, local stakeholders are aware of public benefit of the project and significant contribution to national economy.

The stakeholder groups that attended the meeting are:

- Local authority (İzmir Provincial Directorate of Health) (1 representatives)
- Local Public (20 representatives)
- Project Employees (1 representatives)
- ESA consultant (2 representatives)

The points that were discussed during the meeting were:

- Project information,
- Construction period,
- Environmental and social studies that were conducted for the project,

No specific concern for public on community members. The opinions and issues that were raised during the answer and question session is shown below:

- Will the Project be called off due to the election?
- Will there be the transportation from village to the Hospital?

The main outputs of those meetings are provided in Section 6.3

6.3 Summary of stakeholder input

The stakeholder input collected during the socio-economic baseline data collection survey can be summarized as;

- Laka village residents consider the overall project impacts as tolerable with the fact that there will be a health care facility in accessible distance to the village and the real estate value in the village will increase.
- The PPP model for the construction and operation of the project is not known by the community members and this creates concern on the affordability of the provided health care services.
- Laka village mukhtar has contacted various local authorities for getting information on the Bayraklı IHC project. However he has come to the conclusion that even the local authorities don not have detailed information on the project and requests being informed on the project in the future.
- One important factor for choosing the Bayraklı IHC by the local public has been stated by the District Health Directorate is the provision of high service quality of the emergency services. He stated that the emergency services at the existing health care facilities are not adequate for the patients and the waiting times for getting the services can reach up to hours. The management of Bayraklı IHC not by public authorities may create advantages in the form of the quality of services.
- During the interviews conducted with local public it has been stated that the project would benefit from the extension of transportation routes. One other alternative to the Integrated Health Campus would have been improving the preventive health care services in İzmir.

7.0 IMPACT ASSESSMENT METHODOLOGY

Conformance Table - Impact screening and definition of the valued environmental and social components		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Environmental and social assessment/ Consider the potential risks and impacts of the project based on current information, including an accurate project description (all components) and appropriate baseline data	PR 1	PS 1
Environmental and social assessment/ The assessment process covers direct and indirect environmental and social issues	PR 1	PS 1
Identification of Risks and Impacts Environmental and social risks and impacts is identified in the context of the project's area of influence.	PR 1	PS 1

The general methodology adopted by Golder for Environmental and Social Impact Assessment Studies is consistent with the **DPSIR framework** (Drivers-Pressures-State-Impact-Response) developed by the European Environmental Agency ("EEA"). The methodology has been designed to be highly transparent and allow a semi-quantitative analysis of the impacts on the various environmental and social components. In the following paragraphs the methodology is described in its general terms; however the final methodology will be the result of consultation with the client and the relevant stakeholders.

The framework is based on the identification of the following elements:

- **Drivers**: project actions which can interfere significantly with the environment as primary generative elements of the environmental pressures;
- **Pressures** (impact factors): forms of direct or indirect interference produced by the project actions on the environment, able to influence the environmental state or quality;

- **State** (sensitivity): sum of the conditions which characterize the present quality and/or trends of a specific environmental and social component and/or of its resources';
- **Impacts**: changes undergone by the environmental state or quality because of the different pressures generated by the drivers;
- **Responses** (mitigation measures): actions adopted in order to improve the environmental conditions or to reduce pressures and negative impacts.

The overall impact analysis methodology has been developed by Golder based on its experience in the field of the environmental and social impact assessment; the methodology includes the following phases:

- definition of the current state or quality of the different environmental and social components potentially impacted based on the results of the baseline studies;
- identification of the impacts potentially affecting the environmental and social components in the different phases of the project (construction, operation and decommissioning/closure);
- definition and assessment of the effects of the planned mitigation measures.

Impact assessment was performed for main issues for each Environmental and Social component (discipline). The common impact assessment methodology consists of five main steps:

- identification of Project activities that could contribute to environmental or social change;
- evaluation of the potential effects;
- description of mitigations for potential effects;
- analysis and characterization of **residual effects**; and
- as necessary, identification of monitoring to evaluate and track performance.

The general methodology adopted by Golder for Environmental and Social Impact Assessment Studies is consistent with the **DPSIR framework** (Drivers-Pressures-State-Impact-Response) developed by the European Environmental Agency ("EEA"). The methodology has been designed to be highly transparent and allow a semi-quantitative analysis of the impacts on the various environmental and social components. In the following paragraphs the methodology is described in its general terms; however the final methodology will be the result of consultation with the client and the relevant stakeholders. The details of the impact assessment methodology is presented in Appendix J.

7.1 Identification of area of influence

The area of influence is defined by IFC performance standard 1 as "The area likely to be affected by: (i) the project and the client's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project; (ii) impacts from unplanned but predictable developments caused by the project that may occur later or at a different location; or (iii) indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent."

The Area of Influence is defined for each environmental and social component. The baseline data collection and impact assessment is focused on the geographical extends of the area of influence for each individual component and referred as Study Area in the context of the Impact Assessment Methodology.

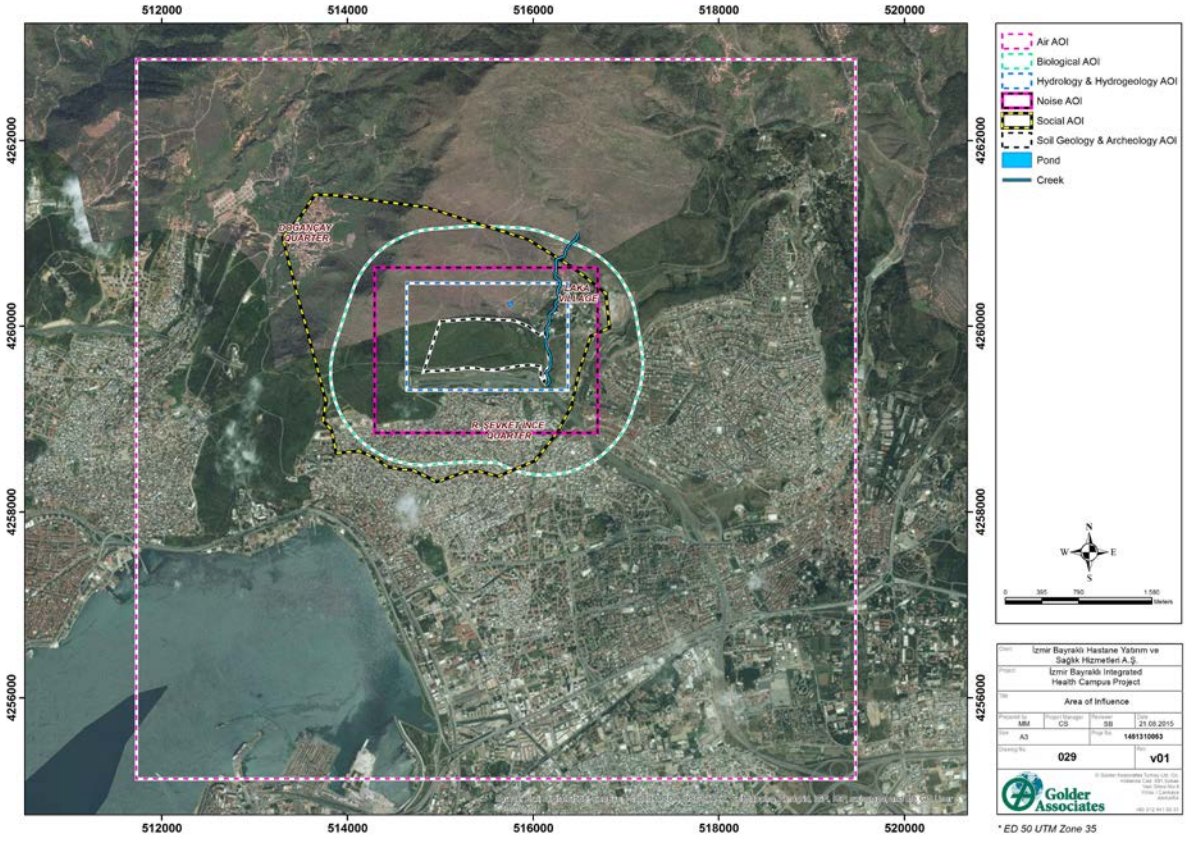
The area of influence of the project would also include;

- Project area occupied by the project facilities
- New and existing transportation routes to be used for construction and operation

- Dumping sites for construction debris
- Waste and waste water disposal facilities to be used during operation and construction

The following drawing presents the AoI set as study area for baseline data collection to be used during impact assessment for environmental and social components.

- Though the actual waste disposal facilities, dumping sites and transportation routes are not specifically included in any of the AoIs drawing below; they are included in the assessment and impacts associated with these facilities are discussed in relevant sections accordingly.
- Considering the dispersion of air quality impacts, the area of influence, where the air quality impacts are to be assessed, will be extended in relation to the results of any applicable dispersion study to be conducted.
- When available, literate information is also collected and presented at a national level and regional level to support the description of the baseline conditions.



Please note that :

Noise and air quality AoI is set by the modelling boundaries

Social components AoI approximates the nearest settlement boundaries however specific social impacts of a broader region including İzmir Municipality are also addressed in relevant sections.

Though the natural protected areas are not included in this drawing they are discussed in relevant sections.

Figure 6 Area of Influence (Study Area)

8.0 ENVIRONMENTAL AND SOCIO-ECONOMIC BASELINE

Conformance Table - Impact screening and definition of the valued environmental and social components		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Environmental and social assessment/ Consider the potential risks and impacts of the project based on current information, including an accurate project description (all components) and appropriate baseline data	PR 1	PS 1

The physical, biological and socioeconomic baseline data has been collected through literature and site surveys as detailed in the appropriate subsections below.

The baseline site data collection was performed through January and April 2015 being in line with the project execution plan. The data collection period would not cover a specific season however the data collection team has considered that the period would establish a baseline condition that would be appropriate for a sound impact assessment. The team has also considered recording any observed seasonality sensitivities of the baseline components during data collection activities and plan additional data collection surveys if required. The findings of the site data collection does not point out a necessity to collect additional baseline data in other seasons of the year except for ambient NO_2 levels that are measured to be higher than national and international standards over the sampling period. Recommendations are provided for the additional monitoring of NO_2 in Section 8.

8.1 Physical components

The study area and methods for the collection of baseline information on physical components are for the each subcomponent and presented in the subsequent sections below. The regional baseline characteristics collected through desktop review are presented in APPENDIX H.

8.1.1 Geology and Geomorphology

Study area for this component is presented in Figure 6.

Geology and geomorphology baseline conditions have been assessed through desktop studies and literature data review.

Main sources reviewed is İzmir-Bayrakli Integrated Health Campus Geological – Geotechnical Investigation Report Phase I, January 2015;

8.1.1.1 Baseline

A geological and geotechnical investigation was carried out in the Project Area to determine its geological characteristics and geotechnical parameters. It included field works and laboratory test.

The field studies were conducted by the Toker Drilling and Construction Eng. Cons. Co. between December 9th and 22nd 2014. They followed the Technical Specification of Foundation Borings for Structures published by The Ministry of Environment and Urban Planning. Nineteen boreholes with 832.40 m of total depth were drilled and 23 test pits were excavated during investigation. The depths of the boreholes varied between 32 m and 55 m below ground level and their locations are shown in Appendix H. Borehole logs and geological cross-sections are given APPENDIX G.

Based on the characteristics described above, geology and geomorphology are a component with a low sensitivity.

8.1.2 Seismology

Study area for this component is presented in Figure 6.

Baseline conditions of seismology component have been assessed from desktop studies and literature data review.

Main sources reviewed are listed below:

- Pamukçu, Oya et al., "A Microgravity Model for the City of İzmir (Western Anatolia) and its Tectonic Implementations", Acta Geophysica vol. 62, no. 4, Aug. 2014, pp. 849-871;
- Bozkurt, E., 2000, "Neotectoncis of Turkey - a synthesis", Geodinamica Acta, 14, 3-30;
- Emre O, Ozalp S, Dogan A, Ozaksoy V, Yildirim C, Goktas F (2005), "The active faults and their earthquake potential in Izmir Province". MTA General Directorate of Geology Etudes Official Report no: 10754, Ankara, Turkey;
- Modelling of ground seismic behaviour for construction design safety in the Izmir Metropolitan Area, Aliağa and Menemen Districts, September 2007;
- "2012 Annual Earthquake Report" published by Prime Ministry; Disaster & Emergency Management Authority; Department of Earthquake;
- The Map of Turkey Seismic Zones published by Prime Ministry; Disaster & Emergency Management Authority; Department of Earthquake.

8.1.2.1 Baseline

Project Area is located in 1st degree earthquake zone according national classification criteria for earthquake zoning.

8.1.3 Soil and Subsoil Characteristics

Study area for this component is presented in Figure 6.

Information regarding soil and land use had been collected through desktop studies and available reports.

Soil baseline conditions have been assessed from desktop studies, literature data review and also baseline studies including soil sampling.

- Main sources reviewed are listed below:
  - İzmir Provincial Environmental Status Report, 2013;
  - "Technical Instructions for the Classification Standards of the Soil and the Land Use" prepared by the Ministry of Food, Agriculture and Livestock;
  - Soil Groups, Land Use and Land Use Capability Classification Maps published by the Ministry of Food, Agriculture and Livestock;
  - Helvacı, Cahit, "Relationships between boron and arsenic elements in nature", Dokuz Eylül Uni., Geological Engineering Dept., International Medical Geology Symposium, 2008;
  - Regulation on Soil Pollution Control and Point Source Contaminated Sites" ("Soil Regulation") originally published in the Official Gazette number 27605, dated 8 June 2010; and amended on 11 July 2013 in the Official Gazette number 28704 stating that the binding articles became effective as of 08 June 2015.

- Soil sampling
  - Observations were made during the site walk over to identify any visual indications of contamination or potential contamination sources;
  - Soil samples (and duplicate sample for QA/QC) were collected from the topsoil layer (upper 30 cm);
  - During sampling, the collected samples were observed for any visual and olfactory signs of contamination;
  - During sampling the photographs were taken at each soil sampling location;
  - The samples were stored in a sealed glass jar and preserved in cooler boxes at around 4°C for shipping to the laboratory;
  - After the samples were collected, the locations were recorded using a hand-held GPS instrument;
  - Prior to commencing sampling at each location, the sampling equipment (gloves, shovel etc.) were decontaminated or replaced with the new one in accordance with Golder's in-house procedure (Golder Procedure 10_Proc-04 - Decontamination of Equipment) in order to prevent cross contamination of the samples.

8.1.3.1 Baseline

The Project Area is considered a Greenfield. The land surface of the Project Area is mainly covered with bare soil and weeds. A geotechnical investigation (mentioned before) was carried out at the Project Area. Based on this investigation Andesite/Agglomerate has been observed as the dominant formation while Tuff forms interlayers within the Andesite/Agglomerate. Topsoil and fill /debris with a thickness varying between 0.40-0.50m and 0.30-1.30, respectively [11] have also been observed above the base rock in 8 boreholes.

The "Land Use Profile" for the Project Area, based on the classification assigned by the Ministry of Food, Agriculture and Livestock is meadow land (Figure 7). As seen in Figure 8, the soil in the Project Area is non-calcareous brown soil and has a "Land Use Capability Classification" as Class VI.

[11] This is an indication of less suitable soil for agricultural activities.

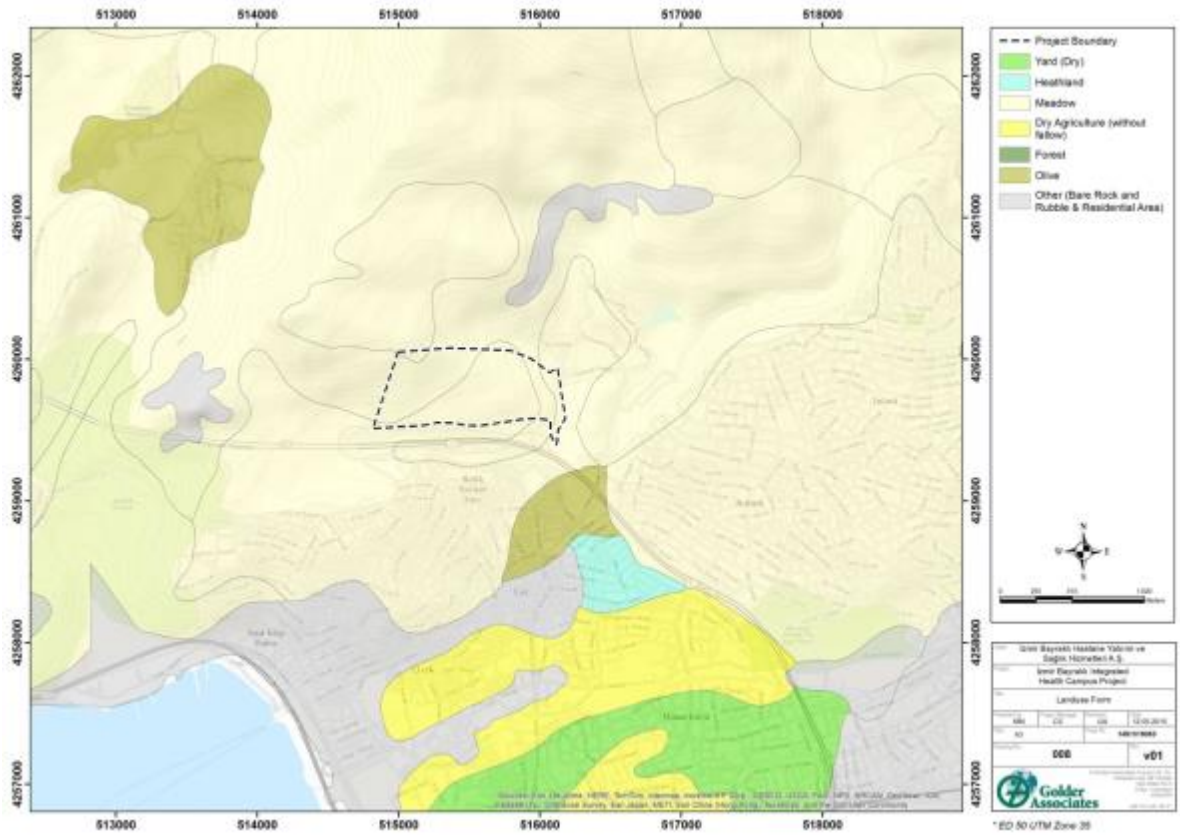


Figure 7: Land Use Profile of the Project Area

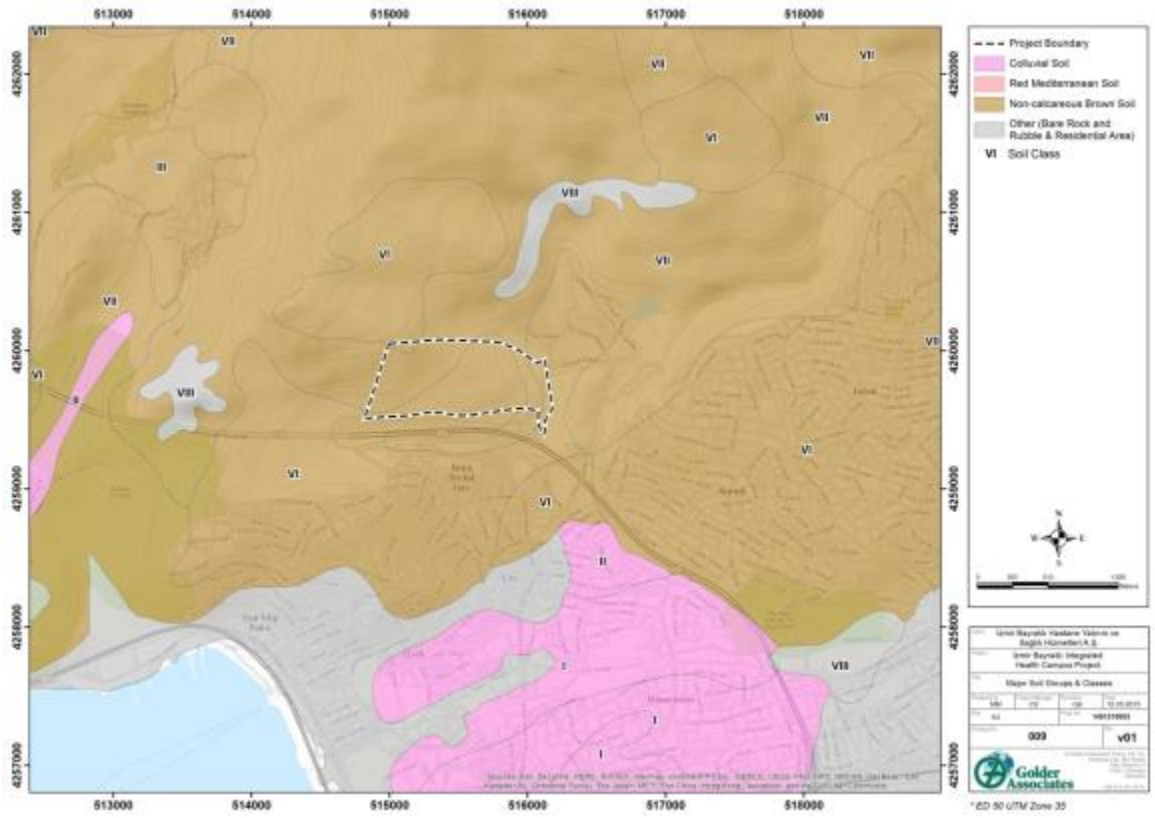


Figure 8: Soil Groups and Land Use Capability Classification of the Project Area

No visual indications of contamination or potential contamination sources were observed at the Project Area during the site visit conducted on 2 - 3 February 2015. In the light of this observation, in order to describe the baseline soil quality, 4 soil samples (and 1 duplicate sample for QA/QC) were collected from the topsoil layer (upper 30 cm) during the site visit. The soil sampling locations and the relevant sample information (coordinates, names, sampling date and time) and the comparison of the soil chemical analysis results to the Turkish Regulatory Limits are given APPENDIX L .

All samples, except TZ-3, have concentrations of Arsenic exceeding the Regulation Limit. There are trace concentrations of TPC and TOX in all samples. Samples TZ-1 and TZ-2 have Chromium concentrations exceeding the regulatory limit.

The Arsenic exceedance does not necessarily indicate a Site impact. Naturally occurring soil in the region is known to have elevated Arsenic concentrations[12].

Chromium occurs naturally in volcanic rocks as a mineral in combination with sulphurs of other metals (Fe, Cu, etc.) in andesite (which are present in the greater site area). In contact with atmospheric oxygen and water sulphuric acid is formed which produces a rapid degradation of the andesite into clay and the release of metals. Undefined human activities may also have contributed to the concentrations found, but these cannot be defined.

The results of the chemical analyses performed on the soil samples do not show significant soil impact on the Project Area. Some presences may be due to natural and anthropogenic causes as the Project Area is located within an industrially developed province.

[12] Helvacı, Cahit, "Relationships between boron and arsenic elements in nature", Dokuz Eylül Uni., Geological Engineering Dept., International Medical Geology Symposium, 2008

Based on the characteristics described above, soil and subsoil characteristics are a component with a low sensitivity.

8.1.4 Hydrology and Surface water quality

Study area for this component is presented in Figure 6.

Information regarding hydrology had been collected through desktop studies and available reports.

Surface water quality baseline conditions have been assessed from desktop studies, literature data review and also baseline studies including surface water sampling.

- Main sources reviewed are listed below:
  - The website of The Republic of Turkey, Ministry of Culture and Tourism;
  - Süzal Ayşın et al., "Dissolved Nutrient Behaviour along the Estuarine Salinity Gradient at the Gediz River Mouth (Aegean Sea, Turkey)", Turkish J. Eng. Env. Sci. 32 (2008) , 67 – 84, August 2008;
  - Şimşek, Celalettin, "The GIS-Integrated Surficial Aquifer Potential Mapping and Its Importance for Aquifer Protection, Küçük Menderes Basin/ West Turkey", Dokuz Eylül University;
  - İzmir Provincial Environmental Status Report, 2013;
  - Regulation on Surface Water Quality" originally published in the Official Gazette number 28483, dated 30 November 2012 and amended in the Official Gazette number 29327, dated 15 April 2015.
- Surface water sampling
  - A desktop study was carried out to identify water bodies in the 1,000 m buffer around the project footprint;
  - Grab surface water samples were collected from the identified water bodies;
  - During sampling the collected samples were observed for any visual and olfactory signs of contamination;
  - During sampling the photographs were taken at the each surface water sampling location;
  - The samples were stored in a sealed plastic/glass jar and preserved in cooler boxes at around 4°C for shipping to the chemical analysis laboratory;
  - After the samples were collected the locations were recorded using a hand-held GPS instrument;
  - The surface water samples that would be analysed for the coliform parameters were directly transported to the laboratory with in the 6 hours period to avoid any disturbance;
  - Prior to commencing sampling at each location the gloves were replaced with the new ones and the bottles were washed with water from the sampling water body in order to prevent cross contamination of the samples.

8.1.4.1 Baseline

No streams or any other natural surface water bodies were observed during the site visit within the Project Area. There is one artificial pond located 150 m north of the Project Area. The pond was constructed by the Regional Directorate of Forestry for firefighting purposes. Additionally, one small creek (Laka Creek) was observed within the Laka Village. The creek is 100 m of the Project Area.

The Project Area is notably steep with slopes over 22%. The Project Area has a trapezoidal shape and a very sharp elevation difference (190 m) between the lowest point (127 m) in its south-eastern corner and the highest (317 m) in its north-western corner. There would be rain water runoff flowing along the slope direction. It is planned to excavate during the construction the entire Project Area to depths varying between 0.45 m to 37.14 m.

In order to describe the baseline surface quality, 2 surface water samples were collected from the Laka Creek and the artificial pond during the site visit conducted on 2 - 3 February 2015. (See APPENDIX L for details).

The assessment of surface water in Turkey is based on the "Regulation on Surface Water Quality" originally published in the Official Gazette number 28483, dated 30 November 2012 and amended in the Official Gazette number 29327, dated 15 April 2015. Table 5 in the Appendix 5 of the Regulation on Surface Water Quality gives the limit concentration values for the water quality classes. The summary of the definitions of the classes are given below. The results of the analyses were compared with the values stated in the Regulation on Surface Water Quality and are given in the APPENDIX L.

- Class I – High Quality Water:
  - Surface water with high potential for drinking water use;
  - Suitable for recreational purposes (dermal contact, including swimming);
  - Suitable for trout farming;
  - Suitable for animal husbandry and farming.
- Class II – Slightly Contaminated Water:
  - Surface water with a potential for drinking water use;
  - Suitable for recreational purposes;
  - Suitable for fish farming except for trout farming;
  - Suitable for irrigation, provided the irrigation water quality criteria are met.
- Class III – Contaminated Water:
  - Can be used for industrial water supply with proper treatment except for industries such as food, textile etc. that require high-quality water.
- Class IV – Heavily Contaminated Water:
  - Lower quality water where the quality parameters do not meet the Class III criteria and can be used only upon treatment to achieve higher quality classification criteria.

The concentrations of the parameters analysed in the sample collected from the Laka Creek (SZ-1) are below the Class I Surface Water limits, except for Nitrite, Total Kjeldahl Nitrogen, Phosphorus, Faecal and Total Coliform. The resulting water classification for the sample collected from the Laka Creek is Class IV - Heavily Contaminated Water. Animal farming is the main source of the income for most of the residents of Laka Village. Animal faeces were observed along the banks of the Laka Creek during the sampling and the creek is highly impacted from the anthropogenic and livestock activities.

The concentrations of the parameters analysed in the sample collected from the artificial pond (SZ-2) are below the Class I Surface Water limits, except for colour, Total Kjeldahl Nitrogen, Aluminium and Total Coliform. The resulting water classification for the sample collected from the Artificial Pond is Class II - Slightly Contaminated Water. The slight contamination is assumed to be a result of anthropogenic activities at the region.

Based on the characteristics described above, hydrology and surface water quality characteristics are a component with a low sensitivity.

8.1.5 Hydrogeology and Groundwater Quality

8.1.5.1 Study area

Study area for this component is presented in Figure 6.

Hydrogeology and groundwater quality baseline conditions have been assessed from desktop studies and literature data review.

- Main sources reviewed are listed below:
  - İzmir Provincial Environmental Status Report, 2013;
  - İzmir-Bayrakli Integrated Health Campus Geological – Geotechnical Investigation Report Phase I, January 2015.

8.1.5.2 Baseline

A geotechnical investigation (mentioned before) had been carried out at the Project Area. Nineteen boreholes with 832.40 m of total depth were drilled and 23 test pits were excavated during the investigation. According to the Geological-Geotechnical Investigation Report, groundwater was not encountered in the borings drilled down to depths varying from 32 m to 55 m. It is expected that the regional groundwater level is deeper than 55 m.

However; it is expected that localized perched groundwater and groundwater originating from fractures may be encountered at the Project Area during rainy seasons.

It is planned to excavate the entire Project Area during the construction between 0.45 m to 37.14 m.

Based on the characteristics described above, hydrogeology and groundwater quality characteristics are a component with a low sensitivity.

8.1.6 Meteorology and Climatology

This section presents the baseline data collection methods and summary of the Meteorological and Climatic Features of the study area. No impact assessment is conducted for this component; however the data are used for the impact assessment conducted for other components.

Data concerning wind, temperature and rainfall recorded by İzmir Meteorological Station, for the 1960-2014 periods, were used for determining general meteorological and climatic conditions of the project area and surroundings. The İzmir Meteorological Station, a body of General Directorate of Meteorology (“MGM”), is situated in Konak District which is approximately 15 km away from the Project Site.

8.1.6.1 Baseline

The subject area is classified as a low-precipitation area in the Mediterranean Basin. The Mediterranean climate is characterized by warm to hot, dry summers and mild to cool, wet winters.

Mediterranean climate can vary in areas due to factors like altitude, distance from the sea, and pressure. Winter precipitation is more influential on plant growth owing to less evaporation in the areas with Mediterranean climate. Average temperature in Mediterranean climate is below 15ºC in winters. Duration of temperature falling below 0^0C is very significant for plant growth. However this duration is below 3% of all cold days in a year in the subject area. Precipitations results show that the sites away from rocky spaces remain green throughout the year. Annual precipitation values are 275 mm at the coast and 350 mm inland; and these values are sufficient for meeting the need for humidity in winter for vegetation.

The precipitation regime in the area is central Mediterranean precipitation regime. In this type of precipitation regime, an area receives rainfall mostly in fall and winter while summer is the driest season. The information concerning precipitation regime is of critical importance in the biology of the area. As a matter of fact, natural vegetation is directly affected by the distribution of rainfalls by seasons. This climate type is characterized by original Mediterranean vegetation series.

8.1.7 Air Quality

Study area for this component is presented in Figure 6.

Set of results of emission measurements, ambient air quality measurements and quality assessment studies, which were conducted by various parties in the region in the last 2 months, were summarized here for determination of the existing air quality.

Methodologies used for the ambient air quality measurements are listed below:

- Particulate matter sampling was conducted according to the gravimetrical method in compliance with EPA 40 CFR Part 50 National Ambient Air Quality Standards for Particulate Matter as recommended by World Bank and Ministry of Environment and Urbanization.
- Settled dust measurements were conducted by using the BS: 1747 Air Quality Measurements Methods Chapter 5, Settled Dust by 4 Directions.
- The SO_2&NO_2 diffusion tubes were analysed at the Gradko U.K. laboratory by UV Spectrophotometry and Ion Chromatography for NO_2 and SO_2, respectively.

8.1.7.1 Baseline

There are two sources of potential impacts on air quality during the construction phase. These are:

- The excavation works and movement of vehicles and.
- The release of engine emissions from the construction equipment and vehicles.

Dust produced during the excavations could be important during the dry weather conditions and may cause negative effects to nearby settlements, public areas and institutions. The exhaust from construction equipment and vehicles may cause nitrogen oxides (NO_x) and sulphur dioxide (SO_2).

Ambient Air Quality

The existing ambient air quality has been evaluated at and around the Project Site for dust and nitrogen oxide (NO_2) and sulphur dioxide (SO_2)..

The ambient air quality measurements were conducted by an accredited firm named Disten for the Project. Settled dust and first campaign of (4 of the total 12) SO_2&NO_2 diffusion tubes measurements were conducted between February 18 and April 18, 2015 and PM_{10} measurements were conducted between February 18 and 19, 2015. Rest of 8 diffusion tube measurements were conducted between March 15 and May 15, 2015.

As a total within the ESA studies, the field measurements listed below were conducted to support the baseline data:

- 24 hour PM_{10} measurements at 4 locations.
- Settled dust measurements at 4 locations.
- SO_2&NO_2 measurements at 12 locations.

The coordinates and locations of the measurement points are shown in below figure.

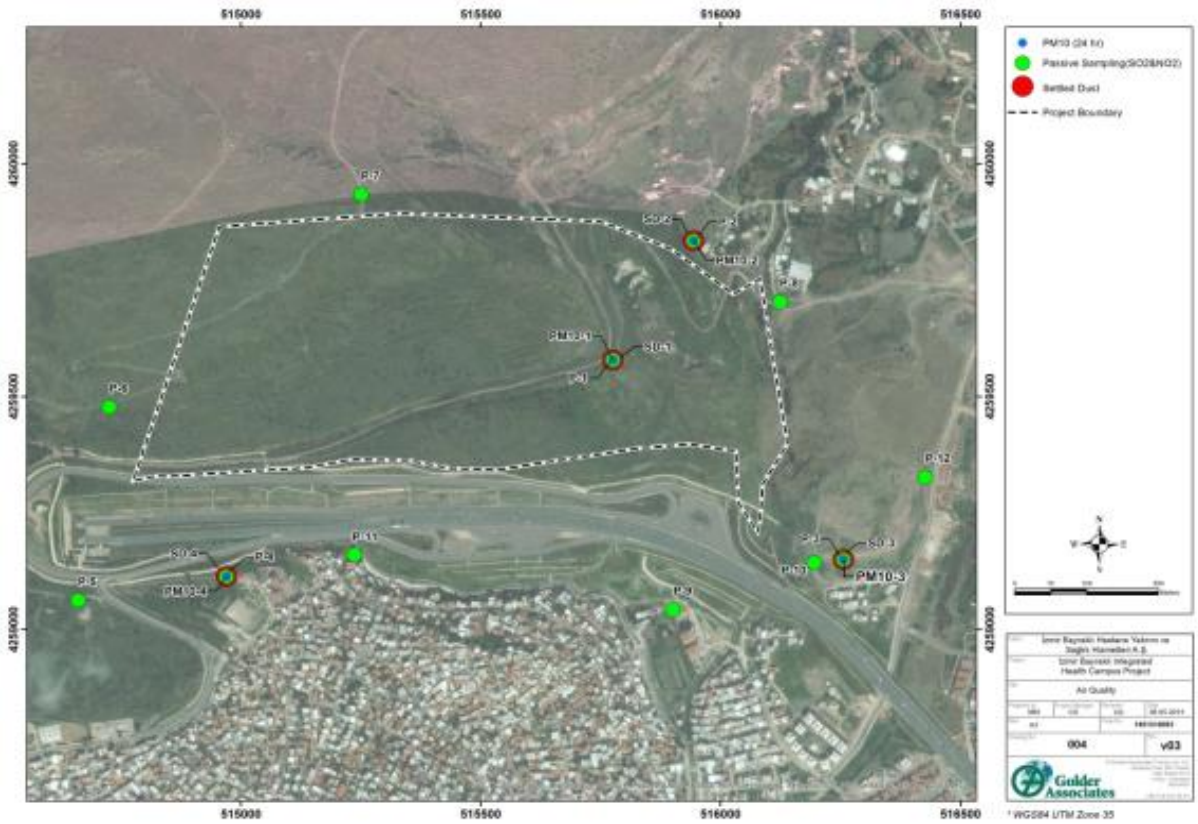


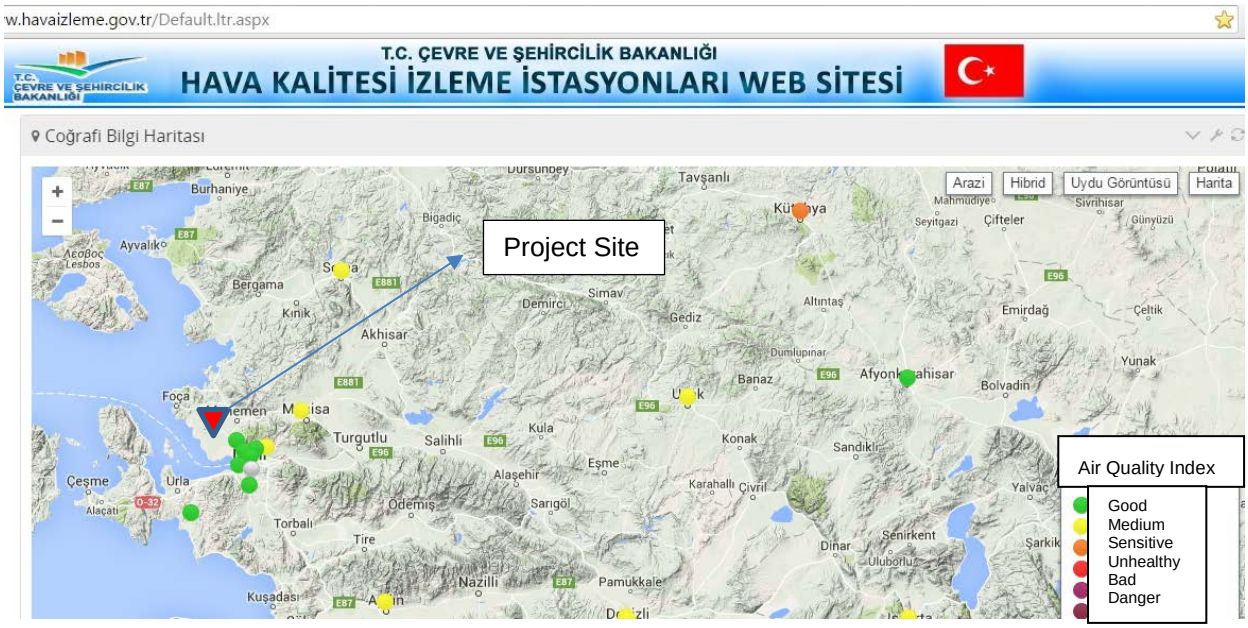
Figure 9: Measurement Locations

Measurement results with respect to the relevant Turkish and International standards limits for ambient air quality are summarized in APPENDIX L.

As seen from the measurement summary tables, PM_{10}, settled dust and SO_2&NO_2 measurement values comply with limit values of both national and international standards except from NO2 values for P-2 and P-3 due to the heavy vehicular traffic close these measurement points on the stabilised road during the measurement period

National Air Quality Monitoring Network, which is operated by the Ministry of Environment and Urbanization, has monitored air quality data[13] in order to assess the "air quality index" of the region. There are 18 stations in Aegean Region. 8 of them are located in İzmir. The locations of those stations are shown in below figure.

[13] PM10, SO2&NO2, NOx, O3, CO parameters.9



According to the National Air Quality Monitoring Network, the air quality in İzmir Bayraklı is in "good" condition.[14]

The closest stations to the Project Site are İzmir Bayraklı and İzmir Bornova Stations.[15] Both station has no O3 and PM2.5 measurements. The closest station to project site which has O3 measurements is Manisa Soma Station (about 80 km northeast direction from the Project site). The average O3 measurement values for last 2 months at the station is shown below table. As seen from the below table, all values are in compliance with both European and IFC limit values.

Date	O3 (µg/m³)	Date	O3 (µg/m³)	Date	O3 (µg/m³)	Limit Values (µg/m³)
01.02.2016	6	01.03.2016	9	30.03.2016	46	120 (for EBRD) [16] 100 (for IFC) [17]
02.02.2016	4	02.03.2016	8	31.03.2016	57	
03.02.2016	5	03.03.2016	11	01.04.2016	55	
04.02.2016	9	04.03.2016	11	02.04.2016	50	
05.02.2016	10	05.03.2016	8	03.04.2016	59	
06.02.2016	8	06.03.2016	7	04.04.2016	56	
07.02.2016	7	07.03.2016	7	05.04.2016	65	
08.02.2016	3	08.03.2016	6	06.04.2016	53	
09.02.2016	4	09.03.2016	7	07.04.2016	67	
10.02.2016	9	10.03.2016	10	08.04.2016	56	
11.02.2016	9	11.03.2016	10	09.04.2016	63	
12.02.2016	8	12.03.2016	5	10.04.2016	40	
13.02.2016	11	13.03.2016	7	11.04.2016	66	

[14] http://index.havaizleme.gov.tr/Index/Station/117

[15] http://www.havaizleme.gov.tr/Default.ltr.aspx

[16] http://ec.europa.eu/environment/air/quality/standards.htm & http://www.mevzuat.gov.tr/Metin.Aspx?MevzuatKod=7.5.12188&MevzuatIliski=0&sourceXmlSearch=hava%20kalitesi

[17] http://www.ifc.org/wps/wcm/connect/532ff4804886583ab4d6f66a6515bb18/1-1%2BAir%2BEmissions%2Band%2BAmbient%2BAir%2BQuality.pdf?MOD=AJPERES

Date	O3 (µg/m³)	Date	O3 (µg/m³)	Date	O3 (µg/m³)	Limit Values (µg/m³)
14.02.2016	10	14.03.2016	9	12.04.2016	37	
15.02.2016	8	15.03.2016	30	13.04.2016	47	
16.02.2016	5	16.03.2016	62	14.04.2016	53	
17.02.2016	3	17.03.2016	62	15.04.2016	61	
18.02.2016	4	18.03.2016	44	16.04.2016	64	
19.02.2016	4	19.03.2016	41	17.04.2016	70	
20.02.2016	7	20.03.2016	46			
21.02.2016	8	21.03.2016	44			
22.02.2016	6	22.03.2016	43			
23.02.2016	6	23.03.2016	74			
24.02.2016	4	24.03.2016	84			
25.02.2016	6	25.03.2016	55			
26.02.2016	5	26.03.2016	53			
27.02.2016	10	27.03.2016	58			
28.02.2016	7	28.03.2016	61			
29.02.2016	6	29.03.2016	44			

During the ESA studies, PM2.5 measurements were not conducted. PM10 (24 hr) measurements reflect the particulate matter situation of the Project Site. However, the special experiment conducted in South Korea by Dr. Sarath K. Guttikunda[18] presents the following convertion table could be used[19]:

Measured PM10 AQI	5	10	15	20	25	30	35	40	45	50	55	60	65	100
Deducted PM2.5 AQI	9	26	40	54	61	68	76	83	92	99	116	132	149	175

According to the table, PM2.5 values (with range) at the baseline PM10 measurement locations are summarised in below table:

Measurement No:	Measurement Location (UTM ED-50, X, Y)	Measurement Date	Measurement Results (µg/m³)	Measurement Results (PM2.5) (µg/m³)[20]
PM10-1 (µg/m³)	515776 – 4259578	18.02.2015-19.02.2015	18,1	40-54
PM10-2 (µg/m³)	515944 – 4259834	18.02.2015-19.02.2015	18,8	40-54
PM10-3 (µg/m³)	516256 – 4259149	18.02.2015-19.02.2015	19,2	40-54
PM10-4 (µg/m³)	514970 – 4259113	18.02.2015-19.02.2015	19,1	40-54

As seen from the table, estimated PM 2.5 values are in compliance with the interim target of IFC which is 75 µg/m³.

[18] http://www.dri.edu/directory/4902-sarath-guttikunda

[19] http://aqicn.org/experiments/south-korea-pm25-air-quality/

[20] The first interim target limit value of pm2.5 for IFC is 75 µg/m3

Based on the characteristics described above, air quality characteristics are a component with a medium sensitivity.

8.1.8 Noise and Vibration

Study area for this component is presented in Figure 6.

During the baseline studies, baseline noise measurements were conducted at 8 points inside and around the project area. Information on the location of measurement points is presented in Table 12 and the location map of the measurement points is presented in Figure 10.

Table 12: Noise measurement points

Location No	Duration of the Measurement[21]	UTM ED 50 Zone 39		Justification for selection
		X	Y	
N(15)-1	15 minutes	516036	4259438	Project Area
N(15)-2	15 minutes	515845	4259857	Close distance to Laka Village
N(15)-3	15 minutes	515563	4260155	Close distance to Laka Village
N(15)-4	15 minutes	516025	4259819	Close distance to Laka Village
N(15)-5	15 minutes	515635	4259704	Project Area
N(15)-6	15 minutes	515042	4259535	Project Area
N(15)-7	15 minutes	514742	4259252	Close distance to highway
N(15)-8	15 minutes	516178	4259865	Close distance to Laka Village
N(24)-1	24 hours	515776	4259578	Project Area
N(24)-2	24 hours	515944	4259834	Close distance to Laka Village
N(24)-3	24 hours	516256	4259149	Close distance to nearby settlements
N(24)-4	24 hours	514970	4259113	Close distance to nearby settlements

[21] 21. Noise baseline measurements were 24-hour and 15-minute Leq values in line with the methodologies of Ministry of Environment and Urbanisation ad EPA, USA. 15 miniute measurement interval is defined in line with the national and ISO 1996-2 requiremnets considering the measruement location characteristics. 24 hr measurements are taken at selected locations to validate the 15 minutes measurment results. The results are found to be in corrolation and used for comparison with national and IFC noise limits.

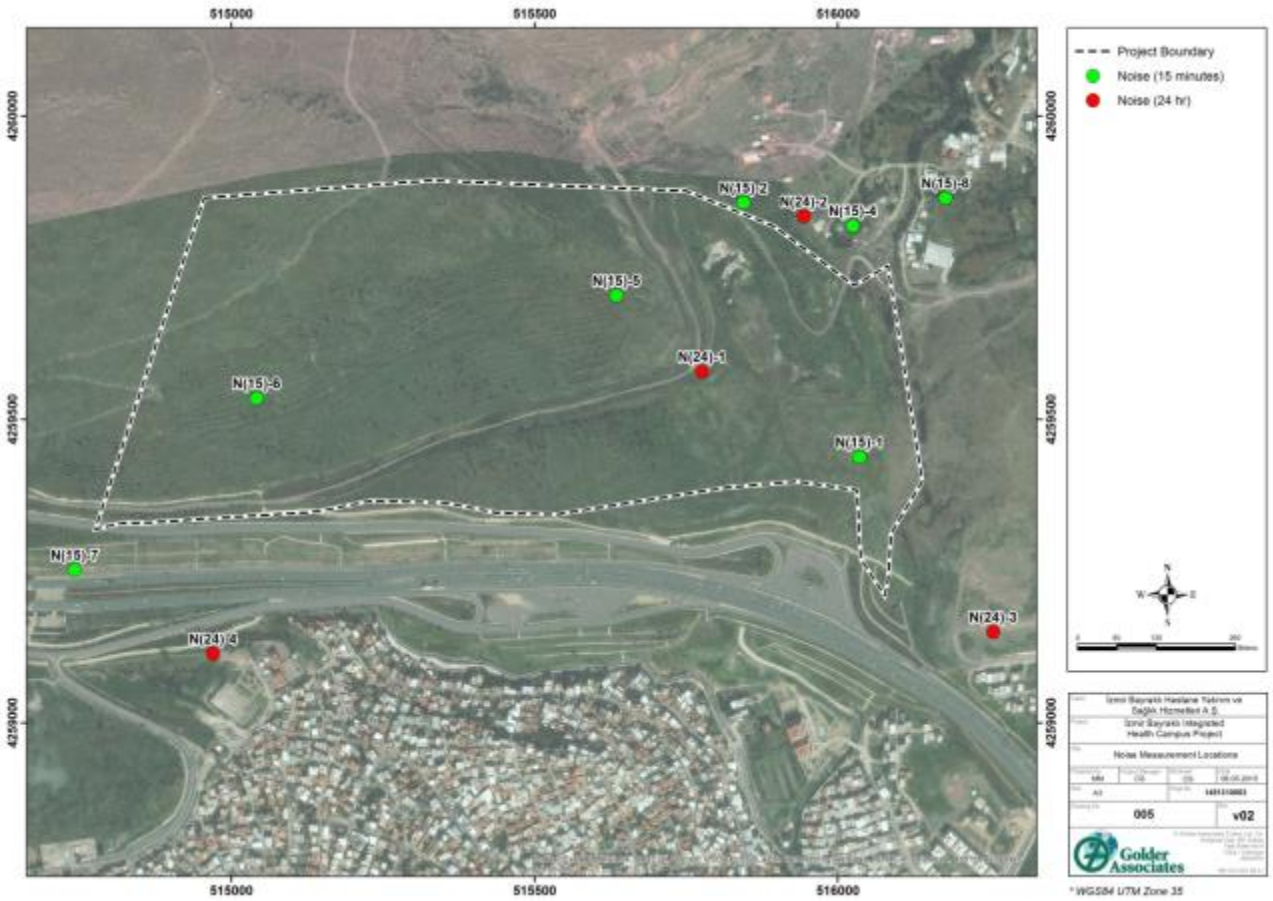


Figure 10: Locations of noise measurements points

The following methodology was applied:

- all measurements are performed at different periods and all of them are in the direction of project area.
- The standards used are TS 9315 ISO1996-1 Definition of Acoustic-Environmental Noise, Measurement and Assessment Section 1: Standard of Basic Quantities and Assessment Procedures
- The measurements are done at 1/3 octave band. The frequency values between 63 Hz and 8000 Hz are recorded.

The measurements were done in front of the receptor with minimum 3,5 m distance, in the direction of project area and at 1,5 m height from the ground with 90 degree angle.

Noise measurements were conducted using a Svan 957 device with HP filter.

8.1.8.1 Baseline

The measurement points and the results of the measurements are presented in Appendix L.

The Project Site itself is classified within “noise sensitive areas where education, culture and health facilities and recreational areas are densely located” in Turkish limits. As it is seen in Appendix L, day time noise levels are between 45.2 – 67 dBA and except the result in N(15)-1, measured noise levels are lower than 60 dBA according to 15 minutes measurements; however according to the 24 hour measurements, day time noise levels are vary between 64.3 – 71.7 dBA which are higher than the limit. Evening and night time

measurements are between 64.7 – 70.0 dBA and 62.7 – 68.6 dBA respectively and these results are above the Turkish limits of 55 dBA and 50 dBA given in Table 13.

Table 13: Turkish Ambient Noise Standards

Receptor Areas	L_{day} (dBA)	$L_{evening}$ (dBA)	L_{night} (dBA)
Noise sensitive areas where education, culture and health facilities and recreational areas are densely located	65	60	55
Areas where commercial buildings and noise sensitive areas are located but residential houses are densely located	65	60	55
Areas where commercial buildings and noise sensitive areas are located but business buildings are densely located	68	63	58
Industrial areas	70	65	60

Source: Regulation on Assessment and Management of Environmental Noise

The Project Site is classified within “residential areas” in IFC limits. The baseline measurements indicated that day time noise levels are between 45.2 – 67 dBA and except the result in N(15)-1 and N(15)-7, measured noise levels are lower than 55 dBA (IFC day time limit) according to 15 minutes measurements. Day time and night time baseline measurements according to 24 hours measurements vary between 65 – 71.1 dBA and 62.2 – 68.1 dBA respectively and these results are higher than the IFC standards of 55 dBA and 45 dBA, given in Table 14.

Table 14: Ambient Noise Standards in IFC General EHS Guidelines

Receptor	One Hour LAeq (dBA)	
	Day time 07:00 - 22:00	Night time 22:00 - 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

The main noise source at N(15)-1, N(15)-5, N(15)-6, N(15)-7, N(24-1), N(24-3) and N(24)-4 points is vehicle movements on the main road at south border of the project area.

Based on the characteristics described above, noise and vibration characteristics is defined to be medium sensitivity.

8.1.9 Traffic and Infrastructure

Traffic baseline data is collected to be used in the traffic impact assessment.

Sources that were used during the baseline data collection are:

- Available information in the literature
- Special traffic study were conducted by the SPV
- Special traffic study were conducted by Golder

The main existing access road that was assessed for the Project Site is the highway O-30 which runs along the south border, separating the Project area from the Bayraklı District. The O-30 highway runs east-west direction of the road connecting to the close neighbourhoods of Bornova and Karşıyaka with Bayraklı. There is a service road which allows drivers to change the direction. The access to the Project would be from this service road. According to the traffic study that was conducted by the Client, accesses to the project site were proposed through two different points, placed in the south-east and south-west points (APPENDIX A).

The Study Area for the traffic and infrastructure is defined as roads approaching to the project site and the surrounding area including İzmir Province. Study area for this component is presented in Figure 6

8.1.9.1 Methodology

The traffic study has been made in order to assess the traffic impact of Project to the current infrastructure and traffic. The scope of the study is:

- Research and observation of existing transportation, infrastructure and traffic condition on Project site.
- Determination of the traffic load of Project
- Projection of traffic volume in the future
- Geometric analysis of the car parking.
- Recommendations on the improvements on the transportation infrastructure, if required.

On February 01st, 2015, a specific study was conducted to assess the vehicular traffic at two connecting service roads (Route 1 and Route 2). Information on actual traffic flow data based on the vehicle category (light vehicle or heavy vehicle) was collected; the number of average hourly passages was counted on roadways on the two different locations indicated in the figure below.

The study was conducted between 15:00 and 16:00.

Figure 11: Traffic routes

8.1.9.2 Baseline Results

The literature data reviewed for the recorded vehicle movements on the O-30 highway. Turkish Highway Directorate records the traffic movement on the main roads and the recorded traffic loads on these sections are shown in the following figure.

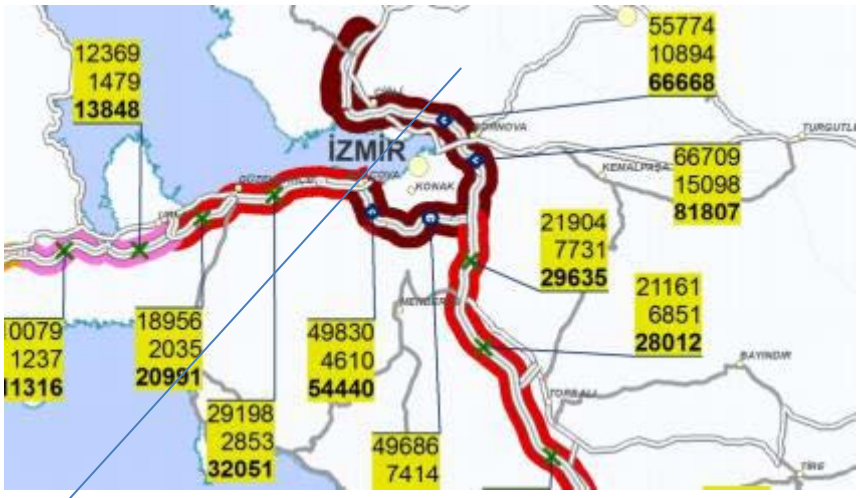


Figure 12: Vehicle Movements on O-30 Highway

Where:

Average number of vehicles recorded per day on O-30 highway	
55774	Light vehicle
10894	Heavy vehicle
66668	Total

There is a service road connecting to the O-30 highway for accessing to the Project site. Number 1 and 2 which is shown in above traffic routes figure are single-lane, paved roads in good condition. During the construction and operation period of the Project the existing roads will be used.

The land traffic in the construction phase will be generated by the machinery, equipment, material and staff to be transported to the Project Site. During the construction phase an increase especially of trucks is expected.

Based on the specific study conducted on February 01st, 2015 the traffic flow of study area is estimated as 60 heavy vehicles and 180 light vehicles per hour for the route 1, 72 heavy vehicles and 186 light vehicle per hour for the route 2.

Based on the characteristics described above, traffic and infrastructure are a component with a medium sensitivity.

8.1.10 Conclusions

The following points can be concluded on the physical environmental characteristics of the project area;

- The Andesite-Agglomerate unit which is observed as the dominant formation in the Project Area.
- Project site is in 1st earthquake zone

- The results of the chemical analyses performed on the soil samples do not show significant soil impact on the Project Area. Some presences may be due to natural and anthropogenic causes as the Project Area is located within an industrially developed province.
- In order to describe the baseline surface quality, 2 surface water samples were collected from the Laka Creek at 100 m of the Project Area and the artificial pond located 150 m north of the Project Area during the site visit conducted on 2 - 3 February 2015. . The resulting water classification for the sample collected from the Laka Creek is Class IV - Heavily Contaminated Water. Animal farming is the main source of the income for most of the residents of Laka Village. Animal faeces were observed along the banks of the Laka Creek during the sampling and the creek is highly impacted from the anthropogenic and livestock activities. The resulting water classification for the sample collected from the Artificial Pond is Class II - Slightly Contaminated Water.
- According to the Geological-Geotechnical Investigation Report, groundwater was not encountered in the borings drilled down to depths varying from 32 m to 55 m. It is expected that the regional groundwater level is deeper than 55 m.
- PM_{10}, settled dust and SO_2&NO_2 measurement values at and around project site comply with limit values of both national and WHO standards except from NO2 values for P-2 and P-3 due to the heavy vehicular traffic on the stabilised road during the measurement period. Annual monitoring of ambient NO2 levels will provide a robust description of the baseline conditions for the ambient levels of NO2 in air in the project area of influence.
- The baseline measurements indicated that day time noise levels are between 45.2 – 67 dBA and except two results measured noise levels are lower than 55 dBA (IFC day time limit) according to 15 minutes measurements. Day time and night time baseline measurements according to 24 hours measurements vary between 65 – 71.1 dBA and 62.2 – 68.1 dBA respectively and these results are higher than the IFC standards of 55 dBA and 45 dBA. The recorded exceedances are estimated to be result of traffic and pedestrian movements close to the sampling points.
- Considerable traffic movement is present on the southern access route to the project area.
- Traffic routes providing connection to the Project Site are single-lane, paved roads in good condition. During the construction and operation period of the Project the existing roads will be used.

8.2 Biological components

Study area for this component is presented in Figure 6.

A **literature research** was performed focused on the RSA area in order to document species and habitat types potentially present in the study area. Scientific literature and “grey” literature were considered in order to give an overview of the vegetation occurring in the area. The literature survey output is presented in Appendix H.

A **field survey** was conducted on March 25th (2015) in the LSA in order to confirm the habitats and identify the presence of flora and fauna species with particular regard for characteristic, exotic, threatened or protected species. Analysis of flora species assemblages helped to confirm the habitat classification and the potential for hosting fauna species. A list of flora species was created from these field surveys and their global and national conservation status

Studies on fauna were supported by literature research and incidental field observations during the field survey. in Appendix H. includes the findings of the field survey.

8.2.1 Baseline

8.2.2 Terrestrial Flora and Vegetation

Studies on terrestrial flora and vegetation are supported by literature research and incidental field observations during the field survey that took place in March 27th (2015).

No Critically Endangered (CR) and/or Endangered (EN) endemic and/or restricted-range species (IFC 2012) were observed or in the study area. The species present are influenced by anthropogenic disturbances (grazing, discharge of construction waste, pollution, reforestation with exotic species).

Based on the characteristics described above, terrestrial flora and vegetation is a component with a low sensibility.

8.2.3 Terrestrial Fauna

Studies on fauna are supported by literature research and incidental field observations during the field survey that took place in March 25th (2015).

No Critically Endangered (CR) and/or Endangered (EN) endemic and/or restricted-range species (IFC 2012) were observed or are expected to be present in the LSA. The only threatened species potentially present is the common tortoise (*Testudo graeca)* listed as vulnerable (VU) by IUCN. Numerous species potentially present in the region are also listed in Appendix II and III of Bern Convention and Appendix I, II or II of M.A.K. decisions.

It should be noted that populations or individuals of the fauna species that could occur in or visit the study area are already impacted by anthropogenic disturbances such as urbanization, grazing, discharge of construction waste, pollution and reforestation with exotic species. Therefore the stable presence of sensitive species in the situ is considered improbable.

Based on the characteristics described above, terrestrial fauna is a component with a medium/low sensibility.

8.2.4 Habitats and Biodiversity

The following habitat types were defined in the LSA:

- re-forested Mediterranean maquis;
- Mediterranean maquis;
- pond;
- stream;
- garden and agriculture;
- urbanized.

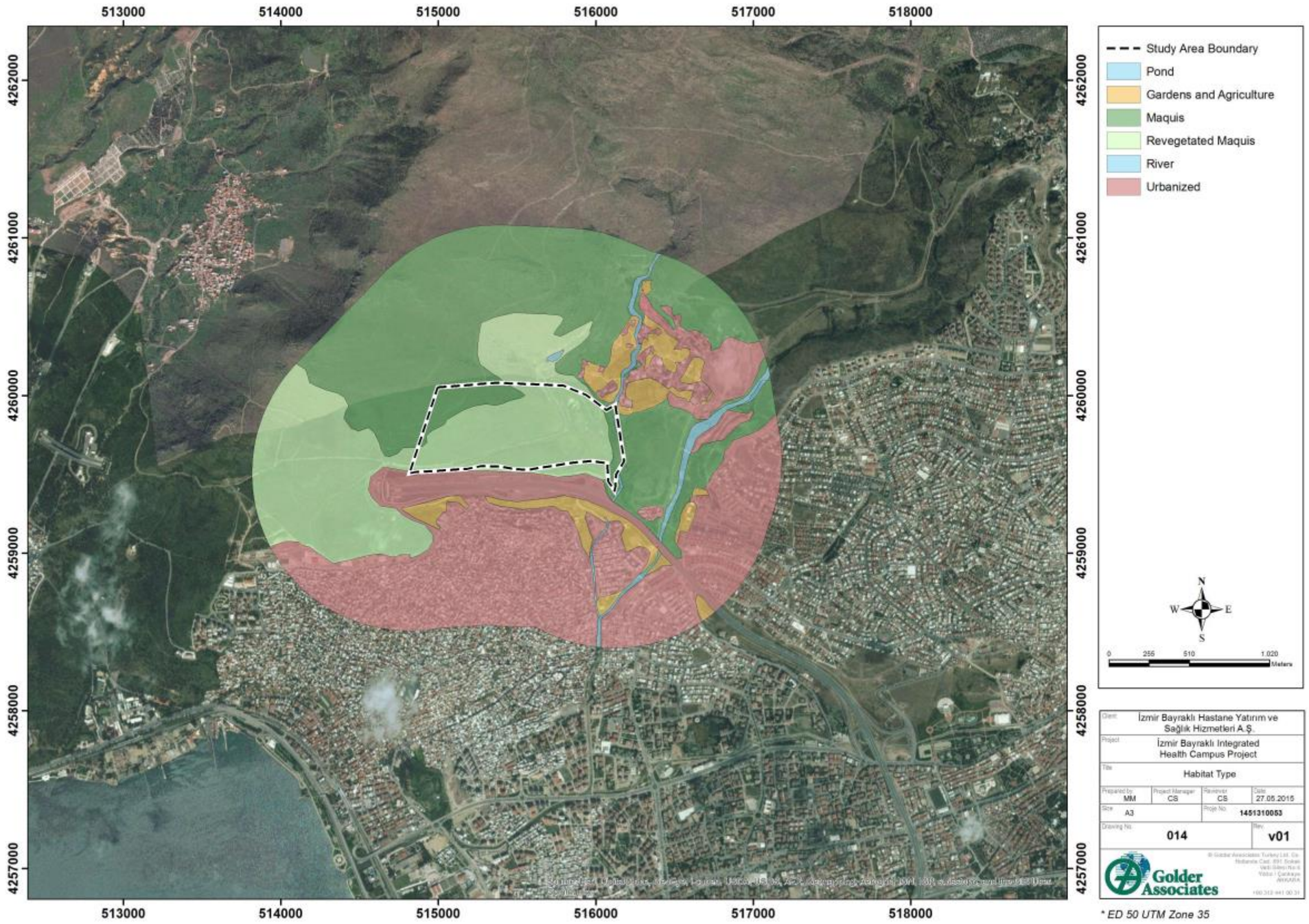
The habitat types present in the LSA were mapped based on satellite imagery and on the data collected during the site survey performed on March 25th 2015. The area of each habitat type identified in the LSA was calculated and are presented in Table 15and Figure 14.

Table 15: area of each habitat type for the footprint area, the buffer area and the total LSA

Habitat Type	LSA (ha)	LSA (%)
re-forested Mediterranean maquis	163.53	23
Mediterranean maquis	241.84	34
artificial pond	0.38	<0.1
stream	11.37	2
garden and agriculture	38.03	5

Habitat Type	LSA (ha)	LSA (%)
urbanized	261.00	36
Total	*716.14*	*100*

Figure 13: Habitat types mapped within the LSA



* ED 50 UTM Zone 35

Figure 14: Mediterranean maquis (top left), artificial pond (top right), re-forested Mediterranean maquis (bottom left), degraded stream at the margins of an urbanized area (bottom right)

The main habitat present within the LSA in Mediterranean maquis (57% of the LSA characterized by rock outcrops and rocky slopes. The areas at lower elevation are heavily grazed by cattle. Better preserved and less grazed maquis with more diverse and natural vegetation is present on the hill top, in the buffer area north of the planned footprint.

Part of the maquis vegetation present in the LSA (23% of the LSA) was reforested in 2012 using the exotic species eucalyptus (*Eucaliptus* sp.) tougher with *Cupressus sempervirens* and *Pinus* sp. Eucalyptus is still extensively used in reforestation since it a robust fast growing species that guaranties the success of the afforestation even in difficult and arid condition. However, the introduction of Eucalyptus could have negative effects on the local environment, e. g., inducing soil degradation, decline of groundwater level, and decrease of biodiversity. Eucalyptus plantations are effective in reducing groundwater level because of high rate of transpiration and evaporation (White et al. 2002). In general, Eucalyptus uses more water than native species (Zahid et al. 2010). The increased water use by Eucalyptus depletes ground water and may lead to desertification (Zahid and Nawaz 2007).

The urbanized areas, gardens and agricultural areas are also an important component within the LSA (36 and 5 % of the LSA respectively). The project site is situated in the suburbs of Izmir and the area is used not only for cattle grazing and bee keeping but also for recreational purposes.

A small artificial pond is present I the north west part of the LSA, uphill from the project. The Pond is used for water buffalo Bubalus bubalis but it has developed some natural wetland vegetation (ex. *Salix* sp., *Phragmites australis*) and it is an important area for wildlife.

The two streams present in the LSA are degraded due to the removal of natural vegetation and pollution caused by illegal dumping of waste and construction material. Cattles farms present in the area also contribute to the eutrophication of the streams.

The biodiversity level of the area is highly impacted by the anthropogenic disturbances described; however Mediterranean seminatural maquis habitats in good conservation conditions are present in the buffer area at higher elevations. The site is also situated in the proximity of key biodiversity areas (section 8.2.5).

Based on the characteristics described above, habitat and biodiversity has a medium sensibility

8.2.5 Protected areas

A National Park and a Natural Park are present a within a buffer of 20 km from the Project site

Örnekköy Tabiat Nature Park (119 ha) is situated at about **5 km** from the site. Nature Parks are areas that contain characteristic vegetation and wildlife features and are particularly suitable for recreational activities.

The **Spil Dagi (Spil Mountain) National Park** is found at about **20 km** north east from site in Manisa province. This National Park was established in 1968 for its wide variety of flora and fauna and its mythological and historical heritage. The area is characterized by canyons, caves and steep valleys. The main species of trees here include pine, juniper, poplar, walnut, elm and oak. The Manisa tulips, which gave their name to a period of the Ottoman Empires, is the iconic species of the park. Species of wildlife living in the park include bears, jackals, roe deer, foxes, badgers, wild goats, vultures and eagles.

In addition to those two protected areas, the presence of four areas identified for their biodiversity value as **key biodiversity area (KBA) and Important Bird area (IBA)** should also be mentioned since they can be considered as “priority biodiversity features” (EBRD 2014). These areas are listed below:

- Yamanlar Dagi key biodiversity area (KBA) in the proximity of the Site the Nord –East;
- Gediz Delta Important Bird area (IBA) is situated about 8 km West of the site;
- Nif Dagi (Nif Mountain) key biodiversity area (KBA) about 9 km South-East of the site
- Spil Dagi (Spil Mountain) key biodiversity area about (KBA) 10 km East of the site

In addition to the protected areas described, three key biodiversity areas (KBA) called Yamanlar Dagi, Nif Dagi and Spil Dagi were identified in the proximity of the Project. These areas are not strictly “protected areas” but they are recognized internationally as important for their biodiversity value.

Yamanlar Dagi (362 km^2) is situated in the proximity of the Site Nord –Est. This particular site is characterized by Phrygana-maquis formations, Coniferous forests (*Pinus brutia* and *P. nigra*), deciduous forests (Castanea sativa) and rocky lands. 18 IUCN red list species are present in this area (Eken et al., 2006) including striped hyena (*Hyaena hyaena*), lynx (*Lynx lynx*), and caracal (*Caracal caracal*) all considered endangered (EN) at National level.

The key biodiversity area (KBA) **Nif Dagi (Nif Mountain)** is about **9 km** South-East of the site. Its extension is of about 214 km^2 and it is characterized by Phrygana-maquis formations, Coniferous forests (*P. brutia* and *nigra*) and mountain pastures. I contains up to 30 IUCN and National/Regional red list species including large carnivores such as striped hyena (*Hyaena hyaena*), lynx (*Lynx lynx*), and caracal (*Caracal caracal*).

Spil Dagi (Spil Mountain) key biodiversity area about (KBA) 10 km East of the site and it surrounds the Spil Dagi (Spil Mountain) National Park

A Ramsar Region, also recognized as Important Bird area (IBA) called **Gediz Delta** (175 km^2) is situated about **8 km** West of the site. The Gediz Delta Ramsar Area (The List of Wetlands of International Importance, 1 March 2012) has an extension of 14,900 ha. The site is an extensive coastal wetland with bays, salt and freshwater marshes, large saltpans, and four highly saline lagoons located at the mouth of the Gediz River near Izmir. The site supports dry grasslands, arable land, and some woodland. The globally threatened pelican *Pelecanus crispus* breeds at the site, since this is an important area for breeding, feeding,

wintering, and sheltering of internationally important numbers of species of water birds. The Gediz River is of vital importance for agriculture in the region, but is becoming significantly polluted; human activities include fishing, agriculture, cattle grazing, and the largest salt production centre in the country is present here.

Based on the characteristics described above, protected areas are a component with a high sensitivity.

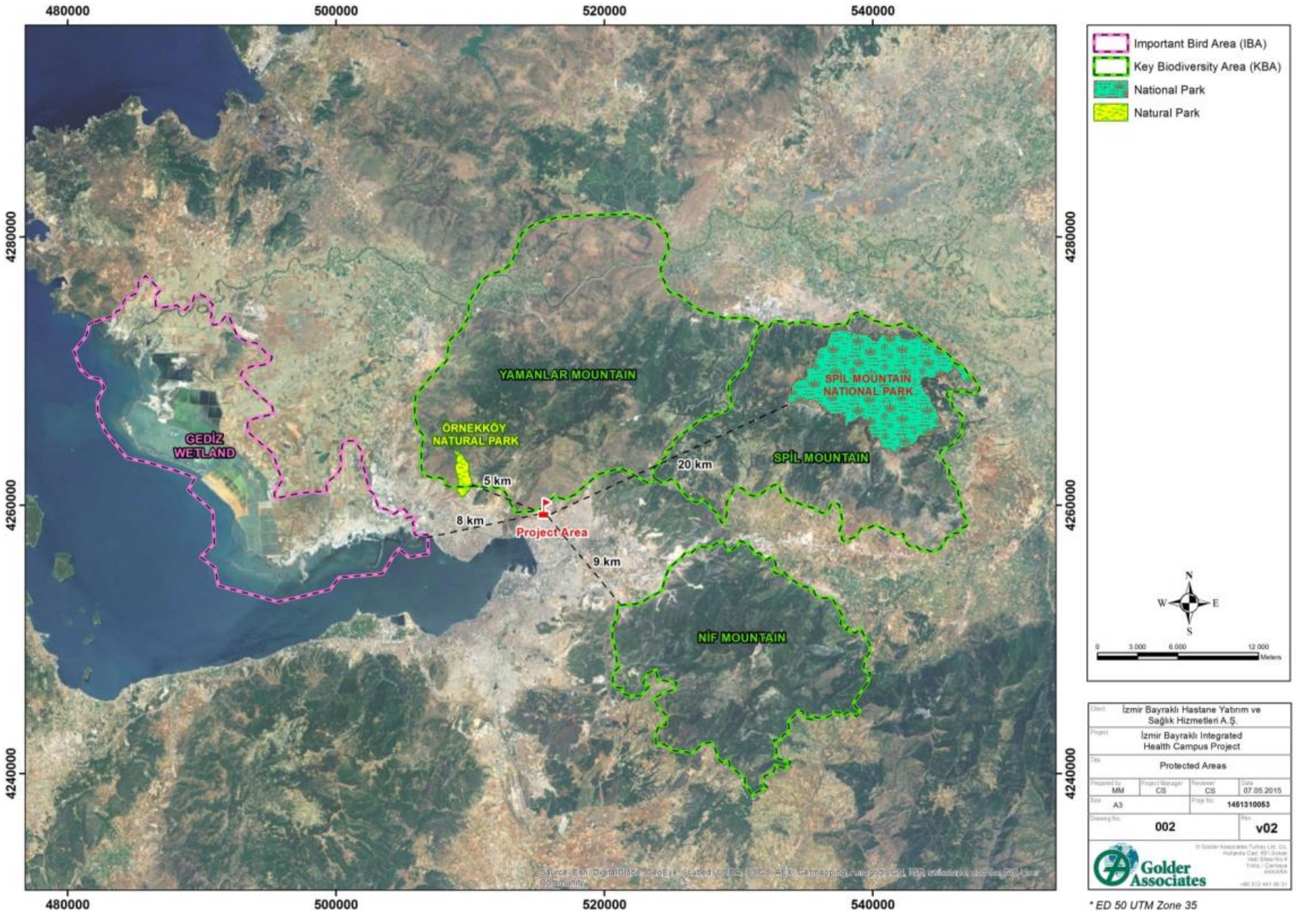


Figure 15: Protected Areas

8.2.6 Conclusions

The following points can be concluded on the biological environmental characteristics of the project area;

- No Critically Endangered (CR) and/or Endangered (EN) endemic and/or restricted-range species (IFC 2012) were observed or in the LSA. The species present are influenced by anthropogenic disturbances (grazing, discharge of construction waste, pollution, reforestation with exotic species).
- The only threatened species potentially present is the common tortoise (*Testudo graeca)* listed as vulnerable (VU) by IUCN. Numerous species potentially present in the region are also listed in Appendix II and III of Bern Convention and Appendix I, II or II of M.A.K. decisions. The populations or individuals of the fauna species that could occur in or visit the LSA are already impacted by anthropogenic disturbances such as urbanization, grazing, discharge of construction waste, pollution and reforestation with exotic species. Therefore the stable presence of sensitive species in the LSA is considered improbable.
- The biodiversity level of the area is highly impacted by the anthropogenic disturbances described; however Mediterranean seminatural maquis habitats in good conservation conditions are present in the buffer area at higher elevations. The site is also situated in the proximity of key biodiversity areas.
- **Yamanlar Dagi** (362 km^2) is situated in the proximity of the Site Nord –Est. This particular site is characterized by Phrygana-maquis formations, Coniferous forests (*Pinus brutia* and *P. nigra*), deciduous forests (Castanea sativa) and rocky lands. 18 IUCN red list species are present in this area (Eken et al., 2006) including striped hyena (*Hyaena hyaena*), lynx (*Lynx lynx*), and caracal (*Caracal caracal*) all considered endangered (EN) at National level.

8.3 Social Components

The study area for social components is decided based on the administrative units, considering that statistical information is usually aggregated and presented according to these boundaries. Study area for this component is presented in Figure 6.

In the case of the present project information has been collected on an area that extends to Greater İzmir with a specific focus on the neighbouring settlements around the project site for primary data collection and is determined as follows:

- Greater İzmir Municipality area
- Bayraklı District
- Laka Village
- R. Şevket İnce Quarter
- Doğançay Quarter
- Osmangazi Village

The project site is located in Laka Village of Bornova District in İzmir province[22]. Though the project site is inside Bornova District administrative unit, Bayraklı district centre is in the close vicinity of the project site. Therefore baseline data collection is focused on Bayraklı District Center but not Bornova District Center.

When available, information is also collected at a national level, to allow comparisons between the local context and the overall situation in Turkey.

[22] The rural areas of Laka village is part of Bayraklı District while the settlement area is part of Bornova District.

A portion of baseline socioeconomic data was collected through desktop, as significant amount of literature secondary socio-economic data on the study area can be found through these means.

In particular most of the information was found through;

- Turkish Statistical Databases,
- Izmir Chamber of Commerce and
- İzmir Development Agency Reports.
- http://www.bornova.bel.tr
- http://www.izmir.bel.tr

Desktop research is primarily focused at gathering hard data and statistics that will then be validated through the collection of qualitative information from the field studies.

Considering the social context and the nature of the project and in addition to the secondary data the qualitative primary baseline information has been collected at district and village/quarter level by using four different means of site data collection. During the socioeconomic baseline data collection following engagement activities were conducted with the project stakeholders between 7th and 11th of April, 2015

Key informant interviews with various stakeholders;

Interviews have been performed with the following groups of stakeholder using a customized in-depth questionnaires. (See APPENDIX C)

Bayraklı Municipality Environmental Protection Directorate

- Bayraklı Municipality Development Directorate
- Bayraklı District Health Directorate
- İzmir Greater Municipality Development General Secretariat
- Northern Hospital Association

In-depth interviews focused on economic activities

In depth interviews have been carried out with stakeholders engaged with economical activities in the local study area.

The stakeholders contacted in Laka village are;

- Husbandry owners
- Shop owners
- Workshop owner

Community level interviews with village people,

Information on the socioeconomic status at local study area has been collected through interviews with the following local stakeholders using community level questionnaires

- Laka Village Mukhtar
- Osmangazi Village Mukhtar

- Osmangazi Village Mukhtar
- Laka Village Council Member
- Laka Village Religious Head
- Head of Laka Municipality Sports and Cooperation Association

During the interviews the concerns of the stakeholders on the potential impacts of the project have also been collected.

Focus groups.

Focus group meetings where the attending stakeholder can interactively engage to the meeting, have also been conducted with the following groups. (See questionnaire for focus group discussions.(See APPENDIX C):

- Laka Village women
- Laka Village men
- Bayrakli City Council

Engagement with the project sponsor

SPV has been requested through a filling a specific questionnaire to provide information on the recruitment policy and the social and environmental management plans to be prepared to minimize the impacts of the project.

8.3.1 Socio-economic conditions and employment issues

Izmir is the third most populous city of Turkey and has the country's largest port after Istanbul. It lies on the coast of The Aegean Sea. Bayrakli is one of the 30 districts of İzmir province.

The population density in Bayrakli District is 12,257 which is considerably higher than the İzmir Province average of 322. This makes Bayraklı District the second most populated district after Konak (with a population density of 17,130).

Bayrakli district is the sixth most populated district of İzmir. (İZKA, 2013). Referring to Turksat 2014 figures of Address Based Population Registration System (ABPRS) the total population of Bayraklı district is 310,765. The change in population figures through the years and the gender distribution , the annual population increase rate are presented in APPENDIX L.

The average age among people in İzmir is 34.1 (higher than national average of 30.1). The average age of people in Bayrakli district is 32.8 which is higher than national average while lower than province average. (İZKA, 2013). The population distribution over age groups in Bayraklı District is presented APPENDIX L

The district has the fifth highest average household size figure of 3.35 in the overall Izmir (TÜİK, 2013).

The total population in Laka village is 381; 198 of which is male and 183 are female and the population density is 60.(2011, http://www.bornova.bel.tr)

As stated by the Laka village mukhtar;

There are 120 household in the Laka village. Nearly 50% of the village population is elementary school graduate and 25% of the village population is high school graduate. There is not significant change in the village population in the last five years.

There are three handicapped persons and 8 woman household heads in the village that can be categorized as vulnerable groups.

Laka has taken the village status in 1994 and the mukhtar of Laka village has not changed since 1994.

8.3.1.1 Economic Structure

Bayraklı district is rather developed as a residential area than a trading, industrial or agricultural region. The economic structure is based on the tradesmen and small sized businesses. The large scale food manufacturing facilities such as Piyale, Tariş Cottonoil, Altınbaşak Flour Factory and Turyağ are demobilising or have demobilised since the Distrcit is becoming more and more residential. The lands of these facilities will be part of Business Centre Areas to be built as part of the new city centre development plan . (IZTO,2008)

Lands available for agricultural activities are nearly extinct in Bayraklı District. Majority of the agricultural land is occupied with residential buildings and the rest is not cultivated.

The milk production in the district is 105 tonnes/year, and honey production is 36 tons/year. 465 sheeps/goats and 119 cattles produced per year in the district. There is not poultry animal breeding in the district. With these figures the income from animal husbandry in the district is below the province average. (TUİK, 2013)

Though the district is cited to host historic settlement like Smyrna (Tepekule) of 3000 ages, the cultural tourism has not developed in the Bayraklı. (İZTO, 2008).

Laka Village

There was apiculture activity observed in Laka Village during social surveys before the conrsuction phase. The beehive owners did not reside in Laka Village. According to the social survey, beehive owners are living in Giresun (north of Turkey) and were using the lands seasonally around the project . Their bee hives were located outside the project site, which was north-east direction of the Site and they abondoned the sites before the startof the construction activities.

There are 400 stalled cattles and 1000 stalled sheeps/goats owned in Laka Village as stated during the site survey interviews with the mukhtars and the livestock owners. They do not use the Project area as a grazing land. Besides that nearly every household in the village has poultry coop serving for the household own consumption and also creating economic income for the household. Laka neighbourhood serves as the meat, milk and egg supplier to the nearby urbanised provincial areas. There are cultivated agricultural areas in the form of orchard, vineyards and gardens in the village also providing economic income at the household level.

30% of the population in Laka is retired. 20% of the population is self employed, 5% is tradesmen/craftsmen and the rest is occupied at agricultural activities. The average income per housed is 1500TRL. There is workforce in the village with construction works experience that could be employed as :

- Logger
- Heavy vehicle driver
- Administrative and office personnel with computer literacy
- Welders, metal worker
- Drivers

8.3.1.2 Conclusions

The presented baseline data for socioeconomic conditions and employment issues point out that;

- The project site is bounded by two settlements areas with different demographic and socioeconomics characteristics.
- Bayraklı District is a highly populated urban area whereas Laka –Village is a less populated area with rural characteristics
- The main economic activity in Bayraklı District is trading and small sized business whereas the main economic activity in Laka Village is agriculture and husbandry.
-
- The sensitivity of the socio-economic and employment context is reported to be medium.

8.3.2 Social Services and Facilities

8.3.2.1 Education

The literacy rate in Turkey is %96 by the year of 2013. The literacy rate in İzmir is %97.7 and higher than national average. The literacy rate among total population of Bayraklı District is 97%. (TUIK, 2013)

The total number of illiterate people in Bayraklı District is 5,828 by 2013 where 4,904 of them are female and 924 are male. (TÜİK, 2013TÜİK)

There are 26 public primary schools, 20 public middle schools and 9 public high schools , 1 community education centre and 1 counselling research centre and three pre-schools in the District. There are many private education facilities in the District.

The average number of students per classroom in İzmir General area and Bayraklı Distrcit are given in APPENDIX L . As can be seen in APPENDIX L the student numbers per classroom in Bayraklı are higher than the figures for İzmir. The situation is similar in middle schools and high schools; Bayraklı District has the fifth and third in İzmir Province with the highest number of students per classroom in middle schools and high schools respectively.

Based on the statistics of İzmir Development Agency, Bayraklı District has lower schooling rate than General İzmir Province has, in relation to the preschool, elementary school and middle schools as seen in (See APPENDIX L)

However the district has better positioning among İzmir districts and at national level in relation to percentage of people with higher education in the general population.

The percentage of people with higher education in Bayraklı district is %15,79. The percentage of people with higher education in Izmir Province is %14,81 (İZKA, 2013).

The total number of cultural facilities in the district is 47. There are two libraries in the district and in addition there are three cultural centres, one open air theatre, one exhibition venue and one movie heather.

There are no preliminary, middle of high school in Laka Village. There are 30 students in the village. Since the location of the village is in close distance to the other settlement areas, the resident students in the village can go the schools in neighbouring settlement areas. 50 % of the village population is primary school graduate.

Any educational facility has not been identified in the impact area of construction activities. The nearest school is Trade Stock-Exchange High School which has 500ms of air distance from construction site and located at south of main İzmir Highway O-30.

8.3.2.2 Health

Substantial information on the exiting health services in İzmir Province in general is provided in Section.1.2.

More specifically, there is a district polyclinic of Alsancak State Hospital located in Bayraklı. There is one private healthcare facility with 89 beds. There are 23 Family Health Center, 96 Family Medicine Units, 1 Family Planning Unit, 6 private dialysis centre, 17 private practices and 46 dental private practices in Bayraklı District. (İZKA; 2013).

In the case of the present project, specific information has been collected during socioeconomic survey activities on the status, adequacy and availability of health services in İzmir Province and in the Bayraklı Distrcit and summarized as below;

- It has been stated during the focus group meeting with Bayraklı City Council that there is requirement for a general hospital in the region or capacity increase of existing hospitals.
- It has been stated by the representative of North Hospital general Directorate that though the population İzmir has increased in the last 20 years, however the rate of increase in the available health care services has not been able to meet the increase rate in population. Another concern stated by the representative was that new health care services established in the last 20 years has difficult access.
- The Health District Directorate stated there are 325000 people registered under family medicine system in Bayraklı and the existing health services capacity in the district is not adequate to respond the needs of this population.
- Majority of the Laka Village residents use Ege University Hospital which has approximately 4,5 kms of air distance to Laka Village.

8.3.2.3 Conclusions

The presented baseline data for social services point out that;

- Literacy rate in Bayraklı District is close to İzmir general average and higher than the national average.
- Although there are various number of educational facilities at different levels the schooling rate in the district is lower than general İzmir average
- There are no educational facilities in Laka village. The students are travelling to the educational facilities in nearby settlements.
- There are various health care facilities in Bayraklı District and no health care facility in Laka village. The officials interviewed states that there is requirement for a general hospital in the region or capacity increase of existing hospitals.
- There is not an educational or health services facility in the direct impact area of the project.
- The sensitivity of the social services context is reported to be low.

8.3.3 Infrastructure

8.3.3.1 Transportation

The transportation system in İzmir Province is composed of public transportation system and the highway and road network.

The public transportation system has the following service components:

- Maritime services
- Railway services

- Bus services
- Dolmuş services[23]

Access to project area from various locations in İzmir by using the public transportation is only possible via a combination of these systems.

The closest maritime port is Bayraklı Port as seen in Figure 16.

Figure 16: Maritime Services in İzmir Province-Bayraklı Port

The closes railway stations are Bayraklı, Salhane and Bornova stations as seen in Figure 17.

[23] Private public transportation means similar to bus services by individual minivan drivers

Figure 17: Public railway transportation system

Access to Laka village (closes location to project site) via public transportation is only possible by shuttle/bus services from Bayraklı (Port and the railway station), Salhane (railway station) and Bornova (railway station) as seen in Figure 18, Figure 19.Figure 20.

Except from Bornova railway station; access by bus services requires changing bus service lines at intermediate stations.

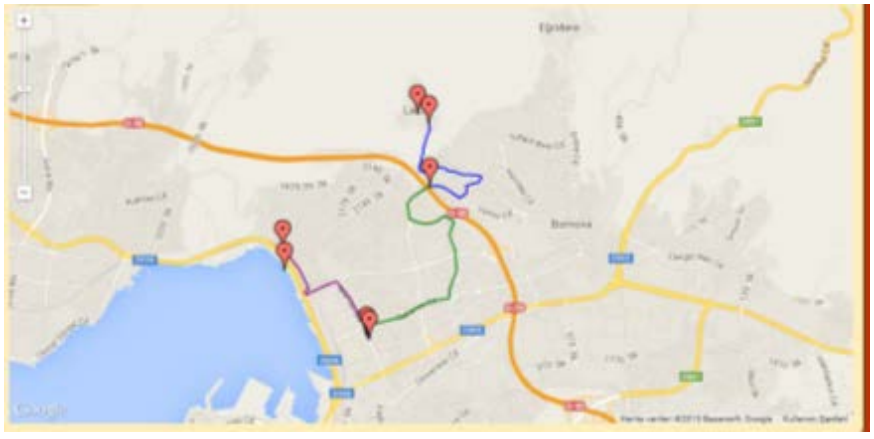


Figure 18: Bus services from Bayraklı to Laka Village-project site

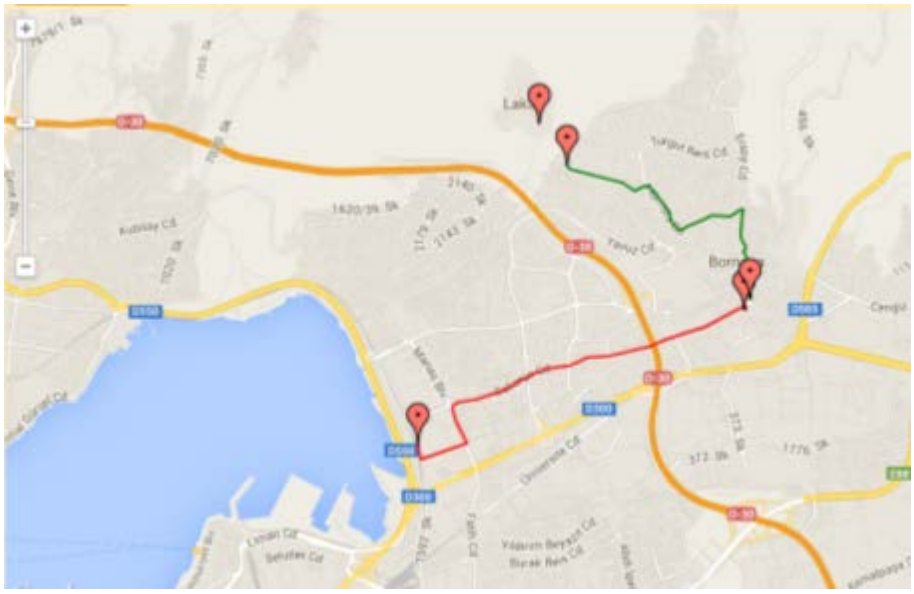


Figure 19: Bus services from Salhane to Laka Village-project site

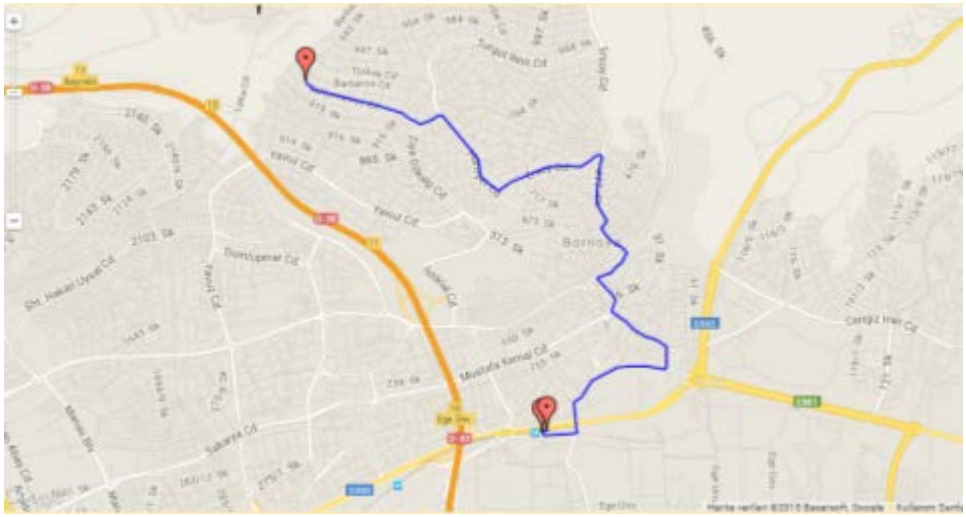


Figure 20: Figure 8: Bus services from Bornova to Laka Village-project site

The project site is close to Izmir Highway E87(O30) and to Laka street. There is no direct connection from existing road network to the project site at the moment as seen in Figure 21:

Figure 21: Road network close to project site

8.3.3.2 Others

In 2010 the ratio of the population with access to drinking and consumption water network to the general population in İzmir municiaplity service area has become equeal to the national average of 99%.
The infrastructure of electricity and communication is also developed in the general municipality area. The electricity consumption is 3774kWh per capita which is above the national average of 2344kWh. (Turstat, 2013).

The waste management system in İzmir municiaplity area has the following components;

- Collection at source and transportation of waste to the transfer stations which is under the responsibility of the district authorities.
- Transportation of waste from the transfer station to the final disposal area by the municiaplity authority.

  There are two waste disposal facility serving Izmir Municipality area:

  - Harmandalı Landfill Area for domestic wastes, non-hazardous industrial wastes, waste sludge
  - Bergama Landfill Area for domestic wastes

The total amount of waste produced in İzmir city is 4500 tonnes/day and the amount of medical waste produced in İzmir city is 12tonnes/day. (http://www.izmir.bel.tr)

The medical waste produced by any facility in the city of İzmir is transported to Manisa Medical Waste Sterilisation Facility licenced by Manisa Municipality. (http://www.izmir.bel.tr).

As per the situation in the Laka village the Table 16 summarizes the general infrastructure conditions at the village.

Table 16 Infrastructure in Laka Village

Infrastructure	Yes	No	Remarks
Water (well, springs)	X		
Electricity	X		

Waste collection	X		By the municiaplity
Shopping	X		
Roads	X		
İnternet	X		
Telephone line	X		
Transportation	X		Bus service: Three in the morning, three at night as a total six per day
Irrigation		X	

8.3.3.3 Conclusions

In the light of the baseline information presented above on infrastructure following conclusions can be drawn;

- Though public transportation network is fairly developed in İzmir and Bayraklı direct access to Laka village is only by bus.
- The project site is close to Izmir Highway E87 and to Laka street. There is no direct connection from existing road network to the project site at the moment.
- Other infrastructure; electricity network, communication, water and wastewater is available in Laka Village
- There is already a management system for the disposal of medical wastes in İzmir.
- The sensitivity of the socio-economic and employment context is reported to be medium.

8.3.4 Land use

The rural areas of Laka village is part of Bayraklı District while the settlement area is part of Bornova District.

The total amount of land owned by the villages is 190 ha. Since stock-farming is done in the village, the land is not used for routine animal grazing as stated by the village mukhtar.

As stated by the District Municipality representatives, the land where the proposed project is to constructed is forestation area. However when Bayraklı is given the district status in 2009 it has been estimated that the urbanisation will extend towards this area. The representative stated that the soil quality in the project land is not suitable for forestation. The foresters in the region has also stated that it will not be possible to perform a successful forestation on this land.

The sensitivity of the socio-economic and employment context is reported to be low.

8.3.5 Cultural Heritage

Study area for this component is presented in Figure 6.

In order to collect baseline data on possible archaeological or immovable cultural assets within the project area, the following studies were conducted;

- desktop studies
- field works, and

- meetings with related public authorities.

The archaeological publications regarding the area were reviewed. Consequently, an academic background on the archaeological potential of the area was established. Indication of any previously identified and registered cultural assets were searched by contacting the İzmir Regional Preservation Board for Cultural Assets. Before the field works, REGIO Site Team has analysed the aerial photographs of the project area together with the GIS Team (Map1). In addition, a 1/25000 scale map with corner coordinates of the project area were produced for the field work (Map 2).

Archaeological sites identified during the desktop studies were marked on the map to form an association with the project area. Desktop studies were implemented in parallel with the field works. Resources used during the desktop studies are:

- Academic Publications
- Historical maps
- Reports on previous Cultural Heritage Works and Field Survey Results
- Inventory Archives of the Ministry of Culture and Tourism.

A study plan for field works has been developed considering the geographical context of the project area. According to the methodology, the project area was divided into grids on the east-west direction and the survey was conducted by walking across the grids in order to scan archaeological assets within the area. The survey carried out by 2 archaeologists experienced on construction and infrastructure projects[24] (Figure 22).

No negative factor (trees and bushes) that prevents the effective observation during the archaeological survey were found on the project area. With the methodology, it is aimed to observe, register and evaluate the visible archaeological traces (potsherds, architectural remains, burials, tumuli, etc.) with respect to geological and archaeological features of the region. In the areas where the archaeological potential is high, archaeological studies were conducted to identify any archaeological assets to the extent permitted by the surface conditions.

Figure 22: Archaeological Team in the Project Area

[24] Halim ÖZATAY, Serkan AKDEMİR.

8.3.5.1 Baseline Study Results

The field work was conducted on 05.03.2015. During the field works, no movable or immovable cultural assets have been identified within the project area. However, it is understood that there are some historical and archaeological sites in the vicinity of the project area based on the inventories of the relevant preservation board and the literature survey,. Two of these sites are Kale Tepee and Küçükkale Tepe archaeological sites.

Kale Tepe is located approximately 1060 m west of the Project area. Küçükkale Tepe is located on 750 m northeast of the Kale Tepe and approximately 920 m west of the Project area (Image 2). The Preservation Board stated that each of these sites is an acropole.

Figure 23: Archaeological Sites in the Vicinity of the Project Area

8.3.5.2 Conclusions

The following conclusions can be drawn in the light of the collected baseline information in the area;

- History of old İzmir is dated back to much earlier periods and there are widespread cultural herniate and archaeological remaining in general İzmir Area.
- No movable or immovable cultural assets have been identified within the project area.
- The closes archaeological site to the project area is at 920 m west of the Project area.

9.0 IMPACT ASSESSMENT

Conformance Table - Impact screening and definition of the valued environmental and social components		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Environmental and social assessment/ Consider the potential risks and impacts of the project based on current information, including an accurate project description (all components) and appropriate baseline data	PR 1	PS 1

Conformance Table - Impact screening and definition of the valued environmental and social components		
Environmental and social assessment/ The assessment process covers direct and indirect environmental and social issues	PR 1	PS 1
Identification of Risks and Impacts Environmental and social risks and impacts are identified in the context of the project's area of influence.	PR 1	PS 1
Mitigation Define mitigation measures in line with mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment.	PR1	PS 1
Biodiversity Conservation Identify and characterise, the potential direct and indirect project-related risks and impacts on biodiversity.	PR 6	PS 6
Land Acquisition and Involuntary Resettlement and Economic Displacement Avoid or minimize physical and/or economic displacement, when displacement cannot be avoided, displaced communities and persons will be offered compensation	PR5	PS5
Cultural Heritage Cultural heritage sites are identified through consultation, literature survey and site studies, protection measures are identified	PR 8	PS 8

9.1 Physical components

9.1.1 Geology and Geomorphology

9.1.1.1 Impact Analysis

9.1.1.1.1 Construction phase

According to geotechnical investigation results, as the dominant rock unit is Andesite/Agglomerate and Tuff, and the groundwater was not encountered in the geotechnical borings, issues related to liquefaction and horizontal spreading are not expected at the Project Area.

In case the stresses transferred from superstructure to foundation level do not exceed the bearing capacity values for the structures to be seated on Andesite/Agglomerate and Tuff which are given in the Geological-Geotechnical Investigation Report[25], settlement related problems are not expected to occur at the Project Area.

Additionally, because Andesite/Agglomerate and Tuff have no swelling potential, swelling related problems are not expected to occur at the Project Area.

The major geo-hazard, expected during the all phases of the Project, would be an earthquake. The earthquake zoning map of İzmir Province according to the Map of Turkey Seismic Zones is given in Section 8.2. Based on the seismic zone classification of Turkey, İzmir Province is in the 1th degree seismic zone which is the most active zone in Turkey where numerous historical earthquakes were recorded.

[25] Geological-Geotechnical Investigation Report Phase I, January 2015

In the event of earthquakes, during the all phases of the Project, significant impact on the community and the workers' health and safety, such as accidents, fire etc., may arise. Additionally, an earthquake may cause adverse impacts on the environment, such as spills, leaks and erosion.

During the construction operations in the Project Area, the project design and engineering will comply with the provisions of the "Regulation on the Buildings to be Constructed on Earthquake Zones" (06.03.2007 O.G. No: 26454). The Regulation requires certain parameters to be determined prior to the construction. These parameters, determined via the geological and geotechnical investigations for the Project Area are:

- Building significance coefficient (I): 1.5
- Soil Type: B
- Local soil class: Z_2
  - Ground spectrum periods: T_A= 0.15 T_B= 0.40
- Effective ground acceleration coefficient (A_o): 0.40 (1st degree earthquake zone)

The Project design and construction operations will take into account the above mentioned parameters and also other specific regulatory requirements related to construction and seismic design at 1st degree earthquake zone.

During the construction phase, impacts will be mainly associated to the following **impact factor:** changes in the local morphology.

The **project actions** related to the abovementioned impact factor are the following: surface levelling and grading, temporary stockpiling of material and construction of the plants and facilities.

The impact is mainly related to the changes inflicted on the current morphology of the area due to the earthworks and excavations, and for the site preparation (scarified, excavated, filled with proper material, and flattened) and the construction of the buildings' foundations.

9.1.1.1.2 Commissioning and operational phase

As a result of the impact screening no impacts on the geology and the geomorphological components are expected during the commissioning and operational phases.

9.1.1.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and since the future use of the Project Area and the surrounding areas is unknown, it is not possible to discuss the details of the decommissioning activities at the closure phase. Once closure timing and the objectives are clearer, decommissioning can be addressed.

In general, the decommissioning activities would comprise the removal of the plants and the associated facilities. Also the foundations of the structures would be removed. The impacts during decommissioning phase are likely to be similar to the construction phase. The same considerations described for geology and geomorphology during the construction phase would be applicable to the decommissioning phase as well.

9.1.1.2 Mitigation measures

The mitigation measures, for the impacts on the geology and geomorphology are listed below for the construction and the commissioning/operational phases:

- Measures incorporated in the Project Design:
  - The Projects design and construction operations will take into account the parameters, for design at a 1st Degree Earthquake Zone, mentioned in Section 8.1.2.
  - The Projects design and construction operations will take into account all relevant regulatory requirements for construction and seismic design at a 1st Degree Earthquake Zone.

- The foundations' footprints and depths have been properly dimensioned; hence the excavations and the consequent physical-mechanical disturbances will be minimized.

- General mitigation measures:
  - The flattening and excavation operation will be minimized to the extent possible in order to limit the morphological disturbances;

Part of the removed material might be re-used as fill at the Project Area, provided that it presents the suitable geotechnical characteristics, in order to limit the use of raw material.

9.1.1.3 Residual Impacts

The residual impacts on the geology and seismology component after the application of the abovementioned mitigation measures are (See Section 9.1.1.2 for details).;

Table 17: Residual impacts on geology and seismology components

Construction phase	Commissioning and operational phase
negligible	negligible

9.1.1.4 Monitoring

No specific monitoring activities are required for this component.

9.1.2 Soil and subsoil characteristics

9.1.2.1 Impact Analysis

9.1.2.1.1 Construction phase

During the construction phase, impacts on the soil and subsoil characteristics component will be mainly associated to top soil and lower soil removal, pollutant emissions to the soil and the occupation of land.

The **project actions** related to the abovementioned impact factors are surface levelling and grading, rock fragmentation, temporary stockpiling of material, transport of construction material, construction of the facilities and disposal of waste deriving from construction (including excavated soil).

In the construction phase, activities related to civil engineering will involve excavation and removal of top and lower soil. It is planned that the entire Project Area would be excavated at varying depths between 0.45 m to 37.14 m during the construction. The main impact will be due to the soil removal for the dismantling and lowering of the natural areas prior to the construction of new facilities. The total amount of excavated material is estimated to be **2,703,180 m^3** (See section 4.3 for the amount of excavated material.). 90% of the amount will be used at site for refilling.

Potential pollutant emissions to the top soil can be caused by; pollution from vehicles such as oil spills, accidental spill of any chemicals or hazardous materials that might be used during the construction, pollution caused by temporary storage of hazardous materials and/or wastes, emissions from truck traffic and transport of construction materials and excavated materials. Hazardous waste would include small amounts of machinery maintenance materials, such as oily rags, used oil filters, and used oil, as well as spill clean-up materials from oil and fuel spills. The temporary storage of waste and/or hazardous substances deriving from the construction operations, if not properly conducted, could induce a release of pollutants into the ground. Also, accidental leakages from machinery and vehicles, potentially polluted water that is not properly collected or managed can also pollute the top soil/soil.

A temporary occupation of land during the construction activities will be necessary for the camp area and to stock excavation or construction material. The planned camp and temporary stockpiling areas will be located

within the boundaries of the Project Area. The construction of new roads is not planned; instead existing infrastructures will be used with the enlargement of the roads.

9.1.2.1.2 Commissioning and operational phase

During the commissioning and operational phases, impacts will be mainly associated to the following **impact factors**: occupation of land, pollutant emissions to the top soil and increase of artificial land use.

The **project actions** related to the abovementioned impact factors are the following: temporary storage and disposal of waste (including medical and radioactive wastes), presence of fuel storage tanks and operations of the facilities. Details of medical and radioactive waste management are provided in Appendix B.

The presence of buildings and facilities will increase the artificial surfaces, as the structures are planned to be constructed on undeveloped land. Occupation of land will occur due to the construction of new infrastructure and road enlargement.

Impacts on soil/topsoil might arise from pollution due to accidental leakages of hazardous materials/products from equipment or chemicals and hazardous wastes/materials storage areas. There will be diesel/fuel storage tanks located in the Project Area. The generators and boilers will be fed by these tanks in case of any shortage. The total amount of the stored diesel/fuel will be designed to suffice the IHC's needs for three days. The pollutant emissions in the soil can also be caused by the leakage from the diesel/fuel storage tanks if the tanks are not properly constructed or maintained or damaged by geo-hazards.

9.1.2.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and since the future use of the Project Area and the surrounding areas is unknown, it is not possible to discuss the details of the decommissioning activities at the closure phase. Once closure timing and the objectives are clearer, decommissioning can be addressed.

In general, the decommissioning activities would comprise the removal of the plants and the associated facilities. Also the foundations of the structures would be removed. The site is expected to be restored for its future use. The impacts during the decommissioning phase are likely to be similar to the construction phase and the same considerations described for soil and subsoil during the construction phase would be applicable to the decommissioning phase as well.

The transfer of construction and excavated materials by trucks will cause emission of dust and pollutants on soil. The dust emissions will be increased during the demolition of the buildings, surface levelling, grading and temporary stockpiling of the material.

At the end of the decommissioning phase, the soil restoration in the areas, once occupied by buildings and infrastructures might have an overall positive impact on the component.

9.1.2.2 Mitigation measures

The mitigation measures are listed in the following for the construction and the commissioning/operational phases:

- Measures incorporated in the Project Design:
  - The foundations' footprints and depths have been properly dimensioned, hence the excavations and the consequent physical-mechanical disturbances will be minimized;
  - In order to minimize the earthworks, allow the traffic and pedestrian access, the buildings have been located in the most accessible part of the site, tiered in the dominant dip direction. The buildings have been arranged so that their highest level is parallel in the direction of the topography;
  - The Project will comply with relevant legal and project safety requirements to avoid leakages from hazardous chemicals and liquids storage facilities on-site;

- The areas, where the diesel tanks located, will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems etc.);
- The temporary storage areas will be constructed based on the Regulation on Landfills (Regular Storage of Wastes) issued on March 26, 2010, at Official Gazette no:27533 and Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314.

- Specific mitigation measures for soil:
  - If soil contamination is suspected during construction related excavation, a detailed assessment should be conducted in order to determine if there are any contaminants sources present within the site or in the near vicinity and the provisions of "Regulation on Soil Pollution Control and Point Source Contaminated Sites" originally published in the Official Gazette number 27605, dated 8 June 2010; and amended on 11 July 2013 in the Official Gazette number 28704, and became effective as of 08 June 2015, should be implemented;
  - In case that results of a soil assessment show the compliance with site-specific soil quality limits set by the regulation, materials coming from levelling activities could be excavated, transported, and used in the construction of embankments and/or backfill, after an assessment of physical properties;
  - If the soil is contaminated, it is recommended to work with the local regulatory agencies to select solutions for treatment or disposal, follow the provision of the abovementioned regulation and in general to follow a standard practice:
  - avoid or minimize temporary stockpiling of contaminated soils or hazardous material;
  - if temporary stockpiling is necessary:
    - isolate the stockpile with impermeable liner or tarps;
    - install a berm around the stockpile to prevent runoff, from leaving the area;
    - do not stockpile in or near storm drains or water bodies or unconfined aquifer zones with high groundwater elevation.
  - if some construction areas need to be located onto vegetated and uncontaminated land, the topsoil will be temporarily removed and properly stockpiled to be returned to the stripped area upon completion of the works;
  - In order to reduce loss of top soil due to project actions during the construction phase, removed topsoil could be stored in an appropriate area in the Project Area, to be used for landscaping after the construction (As required by the Regulation on Excavation, Construction and Demolition Wastes issued on March 18, 2004 at Official Gazette no.25406);
  - if some vegetated/uncontaminated land is expected to be permanently removed (e.g. onto the new buildings' footprints), the topsoil should be properly stored (As required by the Regulation on Excavation, Construction and Demolition Wastes issued on March 18, 2004 at Official Gazette no.25406) and re-used for reclamation of nearby artificial sites.

- General mitigation measures:
  - Construction site will be minimized to the smallest extent possible in order to meet Project's works and activities;
  - Excavations and soil/subsoil abstractions will be minimized as possible in order to meet the building design and construction requirements;

- Part of the removed/excavated material might be re-used for fillings when it presents the proper geotechnical characteristics in order to limit the use of raw material;
- Regular maintenance of vehicles and equipment engines will be undertaken to ensure that leakages of oil/fuel or any other hazardous material is prevented;
- Use of machinery/vehicles will be strictly limited within the construction sites and along the appropriate access roads;
- Impervious (concrete etc.) surfaces will be designated for the refuelling of the machinery/vehicles;
- Portable spill containment and clean-up equipment will be made available and easily accessible at the construction site;
- Training on spill response, use of containment and clean-up equipment will be provided;
- Adequate and properly maintained tanks, paved ground, spill containment materials and proper secondary containment systems with sufficient volume will be provided for fuel storage and for the storage of other fluids and hazardous substances to prevent loss into the soil;
- Although the connection road from the Project Area exists and is paved; it is assumed that during the construction phase the road could be extended and could be partially unpaved. Concerning potential emission of dust and generation of pollution in top soil due to settled dust and traffic emissions, during the construction phase, mitigations measures could consist in the following:
  - Vehicle restrictions to limit the speed, weight, or number of vehicles;
  - Surface improvement, such as paving or adding gravel to the surface;
  - Surface treatment, such as watering.

9.1.2.3 Residual Impacts

9.1.2.3.1 Construction phase

The residual impacts on the soil component after the application of the above mentioned mitigation measures are (See Section 9.1.2.2 for details).;

Table 18: Residual impacts on soil component

Construction phase	Commissioning and operational phase
Low to negligible	Low to negligible

9.1.2.4 Monitoring

Following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- Routine site inspections will be carried out and reported to identify any possible leakages;
- Training programs for spill response will be provided;
- Routine maintenance programme will be set-up and maintenance records will be kept;
- Soil quality monitoring:

- Monitoring sites would be selected among areas in which critical actions or activities are planned;
- Monitoring frequency will be high during construction to plan corrective actions at the initial stage of pollution;
- During the operational phase monitoring would be conducted if deemed necessary.

Monitoring of the application of the waste management plan will be required through inspections and audits as necessary in order to ensure that the disposal of hazardous and medical wastes are in line with the industry practices and regulatory requirements.

9.1.3 Hydrology and Surface water quality

9.1.3.1 Impact Analysis

9.1.3.1.1 Construction phase

Impacts on the hydrology and surface water quality component during the construction phase are related to hydrological change, surface water pollution and surface water run-off.

Impacts could be due to increase of water needs, wastewater generation, disposal of waste deriving from construction (including excavated soil), suspended sediments in surface water run-off and construction of the facilities.

During the construction phase; drinking and potable water for the usage by workers would be provided from the city water network or external sources. In addition to these, there will be water needs for the construction activities such as dust suppression. Construction of a groundwater well and groundwater abstraction for the Project is not planned.

The wastewater generation during the construction phase will consist of the domestic wastewater from the construction camp and wastewater from the construction works. During the construction phase, domestic wastewater would be collected in impermeable septic tanks and disposed according to the provisions of the Water Pollution Control Regulation (WPCR, Issued on 31.12.2004 in the Official Gazette No: 25687) Article 32 and other relevant regulations. Domestic wastewater would be collected in leak-proof septic tanks and the septic tanks would be emptied periodically by a vacuum truck and disposed of to the wastewater sewage system.

The wastewater generation and water requirements during the construction are provided in Appendix B.

The surface runoff patterns in the Project Area would be impacted by the Project with the changes in the characteristics of the surface and the topography.

The temporary storage of waste and/or hazardous substances deriving from the construction operations, if not properly conducted, could induce a release of pollutants onto the ground. Accidental leakages from the use of hazardous substances or refuelling or maintenance operations of machineries are also potential hazards. During the construction, such pollution can migrate with surface water run-off and reach the surface water body close to the Project Area.

Even though there are no plans to construct a groundwater well, drilling at a depth below the water table or dewatering or increase of water demand during the construction and operational phases could have potential impacts on the local hydrology. The impact related to artificial drainage systems has also been considered, as well as the potential pollution due to an inefficient management of water and wastewater.

9.1.3.1.2 Commissioning and operational phase

Impacts on this component during the commissioning and operational phases will be same as the construction phase and are related hydrological change, surface water pollution and surface water run-off.

Impacts could be due to increase of water needs, wastewater generation and disposal of waste deriving from construction (including medical and radioactive wastes).

Abovementioned three project actions for the operational phase are same as the construction phase. The main difference is the generation of medical and radioactive wastes and medical wastewater during the operation phase.

The increase of water needs and wastewater generation is detailed in the previous section (construction phase). The only difference is that, there would be a storm water (rain water) collection system constructed at the Project Area separate from the domestic wastewater network, once the hospital is commissioned. The storm water will be collected to reservoirs where it would be stored, filtered and reused for irrigation.

Medical and radioactive wastes and medical wastewater would be generated during the commissioning and operational phase. The generation of these wastes could cause pollution if they are not managed, stored and discharged or disposed of properly in accordance with the legislation and the IFC requirements.

IFC requirements for Process Wastewater (medical wastewater) from Healthcare Facilities are as follows:

Process Wastewater from Healthcare Facilities often has a quality similar to urban wastewater. Contaminated wastewater may result from discharges from medical wards and operating theatres (e.g. body fluids and excreta, anatomical waste), laboratories (e.g. microbiological cultures, stocks of infectious agents), pharmaceutical and chemical stores; cleaning activities (e.g. waste storage rooms), and x-ray development facilities. Wastewater may also result from treatment disposal technologies and techniques, including autoclaving, microwave irradiation, chemical disinfection, and incineration (e.g. treatment of flue gas using wet scrubbers which may contain suspended solids, mercury, other heavy metals, chlorides, and sulphates).

There will not be an incineration plant within the scope of the Project. The waste water will be generated during the operation of the project as detailed in Appendix B.

If wastewater is to be discharged to sanitary sewage treatment systems, the healthcare facilities would:

- ensure that the wastewater characteristics comply with
  - all applicable permits (regulations on surface water and groundwater pollution control, waste management, etc.)
  - as well as the requirements set forth by the receiving facility and,

ensure that the municipal facility is capable of handling the type of effluent discharged, as discussed in the General EHS Guidelines of IFC.

9.1.3.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and since the future use of the Project Area and the surrounding areas is unknown, it is not possible to discuss the details of the decommissioning activities at the closure phase. Once closure timing and the objectives are clearer, decommissioning can be addressed.

Decommissioning phase activities are likely to be very similar to the construction phase. Decommissioning of infrastructures could have a positive impact if the natural state of the land is recovered; however this is not likely as the area will probably continue to be used for other purposes.

9.1.3.2 Mitigation measures

The mitigation measures are listed for the construction and the commissioning/operational phases:

- Measures incorporated in the Project Design:
  - The Project will comply with safety requirements to avoid leakages from hazardous chemicals and liquids stored on-site;
  - At the construction areas without cover, ground will be seeded and the areas with highest slopes will be terraced to prevent erosion and sediment transport with surface run-off water;

- The areas where the diesel tanks located, will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems etc.);
- The temporary storage areas will be constructed based on the Regulation on Landfills (Regular Storage of Wastes) issued on March 26, 2010, at Official Gazette no:27533 and Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314.

- General mitigation measures:
  - During the construction phase, the surface drainage and site runoff, particularly heavy rain will be properly managed;
  - During the operational phase, the grids of the drainage system will be controlled and cleaned on a periodical basis, in order to prevent possible blockages during rain events;
  - Regular maintenance of vehicles and equipment engines will be undertaken to ensure that leakages of oil/fuel or any other hazardous material is prevented;
  - Use of machinery/vehicles will be strictly limited within the construction sites and along the appropriate access roads;
  - Impermeable surfaces (concrete etc.)will be designate for the refuelling of the machinery/vehicles;
  - Portable spill containment and clean-up equipment will be made available and easily accessible at the construction site;
  - Training on spill response, use of containment and clean-up equipment will be provided;

Adequate and properly maintained tanks, paved ground, spill containment materials and proper secondary containment systems with sufficient volume will be provided for fuel storage and for the storage of other fluids and hazardous substances to prevent loss into the soil.

9.1.3.3 Residual Impacts

The residual impacts on the hydrology component after the application of the above mentioned mitigation measures are (See Section 9.1.3.2 for details).;

Table 19: Residual impacts on hydrology component

Construction phase	Commissioning and operational phase
negligible	negligible

9.1.3.4 Monitoring

Following monitoring activities are foreseen to ensure the implementation and effectiveness of the proposed mitigation measures:

- Design checks to ensure the measures listed above are in place will be undertaken;
- Routine site inspections will be carried out and reported to identify any possible leakages;
- Training on spill response, use of containment and clean-up equipment will be provided;
- Routine maintenance programme will be set-up and maintenance records will be kept;

- Monitoring actions to verify compliance of wastewater with regulatory requirements will be required. A monitoring plan will be set-up to verify the contents of wastewater; samples will be collected per the regulation;
- Monitoring and resource management plan will be prepared to prevent impacts on water and wastewater due to additional wastewater production and usage water needs. Plans will be prepared for minimizing the use of water during construction and operation and for minimizing the natural resource consumption;

Monitoring of the application of the waste management plan will be required through inspections and audits as necessary in order to ensure that the disposal of hazardous and medical/radioactive wastes are in line with the industry practices and regulatory requirements.

9.1.4 Hydrogeology and Groundwater Quality

9.1.4.1 Impact Analysis

9.1.4.1.1 Construction phase

Impacts on this component, during the construction phase are related to the hydrogeological change and groundwater pollution.

Impacts could be due to: increase of water needs, wastewater generation, disposal of waste deriving from construction (including excavated soil) and construction of the facilities.

During the construction phase; drinking and potable water for the usage by workers would be provided from the city water network or external sources. In addition to these, there will be water needs for the construction activities such as dust suppression. Construction of a groundwater well and groundwater abstraction for the Project is not planned.

Even though there are no plans to construct a groundwater well, drilling at a depth below the water table or dewatering or increase of water demand during the construction and operational phases could have potential impacts on the local hydrogeology.

The wastewater generation during the construction phase will consist of the domestic wastewater from the construction camp and wastewater from the construction works. During the construction phase, domestic wastewater would be collected in impermeable septic tanks and disposed according to the provisions of the Water Pollution Control Regulation (WPCR, Issued on 31.12.2004 in the Official Gazette No: 25687) Article 32 and other relevant regulations. Domestic wastewater would be collected in leak-proof septic tanks and the septic tanks would be emptied periodically by a vacuum truck and disposed of to the wastewater sewage system.

The wastewater generation and water requirements during the construction are not quantifiable at this stage.

During the construction phase, groundwater pollution is a potential impact. The temporary storage of waste and/or hazardous substances deriving from the construction operations, if not properly managed could induce a release of pollutants onto the ground. Accidental leakages from the use of hazardous substances or refuelling or maintenance operations of machineries are also potential hazards. During construction, pollution may reach groundwater. No particularly hazardous material is predicted to be used during construction; accidental spills of pollutants from machinery/vehicles would reach groundwater only if the spilled material is in large quantities and the material is spilled over a period of time.

It is planned that the entire area would be excavated with varying depths between 0.45 m to 37.14 m during the construction. It is expected that the regional groundwater level is deeper than 55 m and no major pollution risk is foreseen.

In case groundwater is encountered during the construction, groundwater should be abstracted from the work area; treatment, storage and disposal should be done according to the regulatory requirements after necessary analyses have been performed and relevant permits are obtained.

9.1.4.1.2 Commissioning and operational phase

Impacts on this component during the commissioning and operational phases will be same as the construction phase and are related to the following **impact factors:** hydrogeological change and groundwater pollution.

Impacts could be due to the following **project actions**: increase of water needs, wastewater generation and disposal of waste deriving from operation (including medical and radioactive wastes).

The increase in water demand and waste water generation, and the actions to be taken are detailed in the previous section (construction phase).

Medical and radioactive wastes and medical waste water would be generated during the commissioning and operational phase. The generation of these wastes could cause pollution if they are not managed, stored and discharged or disposed of properly in accordance with the legislation and the IFC requirements.

IFC requirements for Process Wastewater (medical wastewater) from Healthcare Facilities are described in Section 3.4.

9.1.4.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and since the future use of the Project Area and the surrounding areas is unknown, it is not possible to discuss the details of the decommissioning activities at the closure phase. Once closure timing and the objectives are clearer, decommissioning can be addressed.

Decommissioning phase activities are likely to be very similar to the construction phase. Decommissioning of infrastructures could have a positive impact if the natural state of the land is recovered; however this is not likely as the area will probably continue to be used for other purposes.

9.1.4.2 Mitigation measures

The mitigation measures are listed for the construction and the commissioning/operational phases:

- Measures incorporated in the Project Design:
  - The Project will comply with safety requirements to avoid leakages from hazardous chemicals and liquids stored on-site;
  - The areas where the diesel tanks located, will be designed and constructed to avoid potential contamination into the soil (paved areas with sufficient secondary containment, proper drainage systems etc.);
  - The temporary storage areas will be constructed based on the Regulation on Landfills (Regular Storage of Wastes) issued on March 26, 2010, at Official Gazette no:27533 and Regulation on Waste Management issued on April 02, 2015 Official Gazette no: 29314.
- General mitigation measures:
  - Regular maintenance of vehicles and equipment engines will be undertaken to ensure that leakages of oil/fuel or any other hazardous material is prevented;
  - Use of machinery/vehicles will be strictly limited within the construction sites and along the appropriate access roads;
  - Impermeable surfaces (concrete etc.) will be designate for the refuelling of the machinery/vehicles;
  - Portable spill containment and clean-up equipment will be made available and easily accessible at the construction site;
  - Training on spill response, use of containment and clean-up equipment will be provided;

Adequate and properly maintained tanks, paved ground, spill containment materials and proper secondary containment systems with sufficient volume will be provided for fuel storage and for the storage of other fluids and hazardous substances to prevent loss into the soil.

9.1.4.3 Residual Impacts

The residual impacts on the hydrogeology component after the application of the abovementioned mitigation measures are (See Section 9.1.4.2 for details).;

Table 20: Residual impacts on the hydrogeology component

Construction phase	Commissioning and operational phase
negligible	negligible

9.1.4.4 Monitoring

Following monitoring activities are foreseen for ensuring the implementation and effectiveness of the proposed mitigation measures:

- Design checks to ensure the measures listed above are in place will be undertaken;
- Routine site inspections will be carried out and reported to identify any possible leakages;
- Training on spill response, use of containment and clean-up equipment will be provided;
- Routine maintenance programme will be set-up and maintenance records will be kept;
- Monitoring actions to verify compliance of wastewater with regulatory requirements will be required. A monitoring plan will be set-up to verify the contents of wastewater; samples will be collected per the regulation;
- Monitoring and resource management plan will be prepared to prevent impacts on water and wastewater due to additional waste water production and usage water needs. Plans will be prepared for minimizing the use of water during construction and operation and for minimizing the natural resource consumption;
- Monitoring of the application of the waste management plan will be required through inspections and audits as necessary in order to ensure that the disposal of hazardous and medical/radioactive wastes are in line with the industry practices and regulatory requirements.

9.1.5 Meteorology and Climatology

9.1.5.1 Impact Analysis

9.1.5.1.1 Commissioning and operational phase

This section presents the assessment of the impacts that the project is envisioned to generate on meteorological and climatic characteristics by the emission of greenhouse gases during the operation phase.

Greenhouse gases (GHGs) include atmospheric gases that absorb and emit radiation in the thermal infrared spectrum, thus causing a warming effect on earth (greenhouse effect).

The greenhouse effect is primarily from CO_2 and water vapour, along with other trace gases in the atmosphere. A number of gases are typically considered as anthropogenic GHGs, including carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons (e.g., CF compounds), and sulphur hexafluoride. Changes in the atmospheric concentration of GHGs may affect the energy balance between the land, the seas, the atmosphere, and space. A measure of such changes in the energy available to the

system from a gas is termed “radiative forcing”, and, holding everything else constant, atmospheric increase of a GHG produces positive radiative forcing.

GHGs can contribute to the greenhouse effect both directly and indirectly. A “direct” contribution is from a gas that is itself a greenhouse gas, while indirect radiative forcing occurs when the original gas undergoes chemical transformations in the atmosphere to produce other greenhouse gases, when a gas influences the atmospheric lifetimes of other gases, and/or when a gas affects processes that alter the atmospheric radiative balance of the earth.

Effects of GHG emissions are generally not relevant on a local scale, except in cases of massive uncontrolled or fugitive emissions, but are rather global in nature as the various gases are rapidly dispersed in the atmosphere where they reside for varying periods of time, from months to thousands of years, and they continue to exert their effects.

Global Warming Potential (GWP) is the index that has been developed to compare different GHGs on a common reporting basis. CO_2 is used as the reference gas to compare the ability of a particular gas to trap atmospheric heat relative to CO_2. GWP is defined as the ratio of the time-integrated radiative forcing from the instantaneous release of 1 kg of a substance relative to 1 kg of the reference gas (i.e., GWP is weight-based, not volume-based). Thus, GHG emissions are commonly reported as CO_2 equivalents (e.g., tonnes of CO_2eq, where a tonne is 1000 kg). Since GWP is a time-integrated factor, the GWP for a particular gas is dependent upon the time period selected. A 100-year GWP is the standard that has been broadly adopted (see table below).

Table 21: Global Warming Potentials (100 Year Time Horizon, 1996 Intergovernmental Panel on Climate Change - IPCC)

Gas	GWP
Carbon dioxide (CO_2)	1
Methane (CH_4)	21
Nitrous oxide (N_2O)	310
HFC-23	11,700
HFC-32	2,800
HFC-125	1,300
HFC-134	3,800
HFC-236	6,300
CF_4	6,500
C_2F_6	9,200
C_4F_{10}	7,000
C_6F_{14}	7,400
SF_6	23,900

There is a Turkish Regulation on the Monitoring of Greenhouse Gases (RMGG) (Official Gazette date/no: 25.04.2012/28274) was released.

This regulation defines the monitoring, reporting and verification procedures for GHG emitted from facilities and activities listed in Annex-I of this regulation.

The main source of GHG in the project will be combustion of fossil fuels during construction and operation phases.

The regulation excludes the combustion emissions from vehicles. Based on the fuel consumption of the vehicles, there may be indirectly and insignificant emission source from the vehicles.

The regulation includes combustion activities with a 20 MWt and higher capacities. During the operation phase there will be trigeneration unit operation combusting natural gas to produce heat for the consumption of the project facilities. The capacity of the unit will be 4 MWt (thermal power). During the operation phase there will be boiler operation combusting natural gas to produce heat for the consumption of the project facilities. The total capacity of the boilers will be 11.2 MWt (thermal power). There will be 5 boilers. According to this, the total capacity will be 15.2 MWt (11.2 + 4) which is below 20 MW.

Nevertheless a calculation for GHG production for trigeneration and boiler operation (being the only major sources of GHG emission for the project) has been provided indicatively for CO_2 using Intergovernmental Panel on Climate Change (IPCC) emission factors. The unit and boilers will be operated on natural gas. Below calculation is presented for the worst case scenario of natural gas combustion (under the assumption of trigeneration and boilers are operated at the same time).

It is estimated that total daily natural gas consumption for both trigeneration unit and boilers will be 16967 kg/day:

- Default Emission Factor for natural gas: 56,100 kg natural gas/TJ
- Fuel Consumption = 0. 897 TJ/day
- CO_2 Emissions = (0.897 TJ/day x 56,100 kg/TJ x 365) / 1,000 = 14,939 ton/year of CO_2 (the contribution of other GHG gases to amount will be trivial)

This calculated figure is below 25,000 tons of CO_2 equivalent above which IFC Performance Standard 3 states a need to quantify the direct and indirect emissions annually.

9.1.6 Air Quality

9.1.6.1 Impact Analysis

Air quality emission and dispersion modelling tools have been used for the impact analysis.

Ozone emissions are not included in the modelling studies since the ozone is not a direct emission possible during the project activities. Ozone is a chemical that would be formed in air under certain conditional of meteorology and existence of other chemicals such us VOC. These conditions are not known and thus the amount of ozone to be formed in air as a result of project activities are not known and not included in modelling studies. However considering the project characteristics and the long term ozone level measured in the region (Refer to 8.1.7.1) it can be concluded the impact of project activities on the ambient ozone levels will be trvial and will not need further analysis.

9.1.6.1.1 Construction phase

During the construction phase impacts will be mainly associated to air pollutants and dust emission.

The project actions related to the abovementioned impact factor are the following: surface levelling and grading, temporary stockpiling of the material, disposal of grading material, transport of construction material.

Construction activities will affect air quality mainly through emissions of dust from the excavation and storage of soil, vehicles traffic on unpaved roads, the emission of particulate from vehicle exhausts and the emission of particulate from stationary sources like power generators. Emissions of gaseous pollutants, particularly NO_x and SO_2, will be mostly related to the vehicle and machinery exhausts and emissions from stationary sources like power generators. Type and number of engineering vehicles, horse power and the emission factors were provided by the Project. Emission values from engineering vehicles have been calculated by using the Exhaust Emission Factors for Non-road Engine Modeling (Report No. NR-009A) of United States

Environmental Protection Agency (EPA). In addition a modelling study has been performed as detailed in APPENDIX M for the dust emissions from excavation and rock fragmentation activities. Air pollutant diffusion graphs are produced and presented in APPENDIX M.

The contribution of ambient PM_{10} and settled dust back ground measurements to the model results were studied. PM_{10} was simulated annually and daily s. Ambient PM10 air quality measurements were conducted for 24 hours. Therefore, 24 hour PM10 measurements are converted to the annual values by using the England Environmental Agency Annex-F. Converted measurement results are shown in APPENDIX M.

Model results at the background measurement locations and ambient air quality measurement results are assessed cumulatively in below table:

Table 22: Cumulative Values of PM10 and Settled dust

Measurement No:	AERMOD Conc.		Background Measurements	Cumulative Value	Limit Values
PM10-1 (µg/m^3)	Controlled daily	1.24	18.1	19.34	90 (µg/m^3)
	Uncontrolled daily	2.48		20.58	
PM10-2 (µg/m^3)	Controlled daily	0.98	18.8	19.78	
	Uncontrolled daily	1.96		20.76	
PM10-3 (µg/m^3)	Controlled daily	1.36	19.2	20.56	
	Uncontrolled daily	2.72		21.92	
PM10-4 (µg/m^3)	Controlled daily	1.42	19.1	20.52	
	Uncontrolled daily	2.85		21.95	
PM10-1 (µg/m^3)	Controlled annual	0.18	15.3	15.48	56 (µg/m^3)
	Uncontrolled annual	0.35		15.65	
PM10-2 (µg/m^3)	Controlled annual	0.07	15.9	15.97	
	Uncontrolled annual	0.14		16.04	
PM10-3 (µg/m^3)	Controlled annual	0.08	16.2	16.28	
	Uncontrolled annual	0.17		16.37	
PM10-4 (µg/m^3)	Controlled annual	0.11	16.1	16.21	
	Uncontrolled annual	0.21		16.31	
SD-1 (mg/m^2-day)	Controlled settled dust	9.96	62.3	72.26	390 (mg/m^2-day)
	Uncontrolled settled dust	19.9		82.2	
SD-2 (mg/m^2-day)	Controlled settled dust	3.60	65.6	69.2	
	Uncontrolled settled dust	7.20		72.8	
SD-3 (mg/m^2-day)	Controlled settled dust	5.90	51.5	57.4	
	Uncontrolled settled dust	11.80		63.3	

As seen from above table, cumulative values for both controlled and uncontrolled situations are below the limit values.

9.1.6.1.2 Commissioning and operational phase

In order to evaluate impacts on air quality due to the project during the commissioning and operational phase in comparison to existing ambient air quality conditions and to set the most suitable stack heights for combustion releases, an air dispersion model has been developed.

The Project is already located at nearby the highway. In relataion to the impact of increase in traffic emissions during operation following poinst could be considered:

- The road is a divided highway, which means that the direction of the traffic flow is both from east – west and west – east. Thus, the hospital can be accessed from both directions which will divert the traffic increase into both directions rather than concentrating to one traffic flow direction,
- There has already been public transportation services to the Project area which would be a limiting factor on traffic increase,
- Emission sources from traffic vehicles are not point source.

Considering these issues, the impact of the traffic increase on the current air quality around the project site will be incremental.

The exact number, speed and type of the vehicles to be accessing to the hospital together with the access freaquency are not certai and will be changing. This will be a significant limitation for exact quantification of the traffic emissions during operation of the hospital.

In the light of the above mentioned, the air emissions from traffic increase during the operation of the hospital are not included into the air quality emission and dispersion modelling.

Nevertheless, there will also be monthly air quality monitoring at sensitive receptors during the operation phase. In case of any exceedance of limit values, as a stakeholder the Metropolitan Municipality will be informed and SPV will coordinate with the Municipality to increase the public transportation numbers or additional services.

Regarding air pollutants measured within the impact zone of the Project, those used as impact descriptors are represented by nitrogen oxides ("NOx"), sulphur dioxide ("SO_2").

Air dispersion modelling has been conducted using AERMOD. For each pollutant, concentration values at ground level were calculated needed to make comparisons with the expected air quality standards. The details of the modelling and pollutant diffusion graphics are provided in APPENDIX M.

The contribution of background SO2&NO2 measurements to the modelling ground level pollutant results were studied. SO2 and NO2 were simulated annually and daily separately. Ambient SO2&NO2 air quality measurements were conducted for two periods between February and April.

Model results at the background measurement locations and ambient air quality measurement results are assessed cumulatively in below table:

Table 23: Annual Cumulative Values of SO2 and NO2

Measurement No:	AERMOD Conc.		Background Measurements		Cumulative Value		Limit Values	
	SO2	NO2	SO2	NO2	SO2	NO2	SO2	NO2
P-1 (µg/m^3)	0.13	0.09	2.74	23.45	2.87	23.54	20	40
P-2 (µg/m^3)	0.17	0.12	2.68	49.44	2.85	49.56		
P-3 (µg/m^3)	0.09	0.06	2.19	46.07	2.28	46.13		
P-4 (µg/m^3)	0.04	0.03	1.83	17.62	1.87	17.65		
P-5 (µg/m^3)	0.11	0.08	1.62	26.68	1.73	26.76		
P-6 (µg/m^3)	0.08	0.06	-	37.67	-	37.73		
P-7 (µg/m^3)	0.1	0.07	2.23	21.89	2.33	21.96-		
P-8 (µg/m^3)	0.13	0.09	1.8	16.5	1.93	16.59		
P-9 (µg/m^3)	0.12	0.08	2.10	29.73	2.22	29.81		
P-10 (µg/m^3)	0.1	0.07	1.46	14.27	1.56	14.34		
P-11 (µg/m^3)	0.04	0.03	1.59	15.7	1.63	15.73		

Measurement No:	AERMOD Conc.		Background Measurements		Cumulative Value		Limit Values	
	SO2	NO2	SO2	NO2	SO2	NO2	SO2	NO2
P-12 (µg/m^3)	0.1	0.07	1.46	10.88	1.56	10.95		

As seen from above table, cumulative values for both SO_2 and NO_2 concentration results are below the applicable limit values except from the NO_2 results for P-2 and P-3. This results from the heavy vehicular traffic on the stabilised road during the measurement period. The mitigation measures are provided in chapter 9.1.6.2.

9.1.6.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and the future use of the Project site and surrounding areas is unknown, it is not possible to discuss the details of decommissioning activities at closure. This discussion will start in a second moment, once closure objectives are clearer.

Impacts during decommissioning phase are likely to be similar to construction and the same considerations describe during construction are applicable here as well.

9.1.6.2 Mitigation measures

The following mitigation measures are considered relevant during construction phase to mitigate dust dispersion during construction activities:

- wetting and covering powdery materials transported on trucks;
- reduce trucks and vehicle speed;
- washing facilities, such as hose-pipes and ample water supply, should be provided at site exits, including mechanical wheel spinners where practicable;
- if necessary, all vehicles should be washed down before existing the construction site;
- periodic wetting of the stockpiled material to maintain the humidity percentage at about 5%;
- periodic wetting of the construction areas;
- use of working machinery with low emissions; and good levels of maintenance;
- vehicles will be maintained in good condition to ensure they are no louder than other, similar vehicles on the roadways;
- use of diesel with low sulphur content;
- periodic maintenance of machinery with combustion engine.
  - Fragmentation areas will be moistened before any fragmentation activity will occur.
  - There will not be any fragmentation after 18:00 of the day.
  - Fragmentation areas will be controlled twice for avoiding any incidents at the area before the rock fragmentation activity.
- The nearest settlement areas will informed before rock fragmentation activities

Regarding the Project area, during the operational stage the only emission source is the exhaust gas from the vehicles and emissions from natural gas during operating phase under the scope of the project.

All measures given in the Regulations on the Control of Industrial Air Pollution, published on 03.07.2009 in Official Gazette No.27277, shall be taken in order to minimize dust emission during the construction period.

During the operation phase, the emissions related to heating purposes would be controlled periodically and it would be complied with the applicable environmental emission standards.

A programme will be in place for the monitoring of NO_2 levels at the points where air dispersion modelling shows exceedances.

9.1.6.3 Residual Impacts

The residual impacts on the air quality component after the application of the above mentioned mitigation measures are (See Section 9.1.6.2 for details).;

Table 24: Residual impacts on air quality component

Construction phase	Commissioning and operational phase
negligible	negligible

9.1.6.4 Monitoring

Periodic dust (PM10 and settled dust) monitoring should be conducted at the closest settlement, during construction stage and will be compared with the Regulation on the Control of Industrial Air Pollution.

A monitoring programme of NO_2, SO_2, emissions from the trigeneration and the boiler stacks will be in place.

A monitoring programme of NO_2, SO_2 at the residential area before construction and during the commissioning and operational phase will be in place.

Exhaust emissions from construction and transportation vehicles should be periodically monitored along with the requirements in the Regulation on Control of Exhaust Gas Emission both in construction and operation period of the project.

9.1.7 Noise and Vibration

Noise to be generated during the construction stage of the Project is local and temporary and it will finish at the end of construction. The noise to be generated during Project operation may be expected to be caused by the emergency generators, helicopter movement and ambulance movement.

Effect of vibration is not expected to go beyond the construction site considering the machinery and equipment to be used in construction.

Impact factors that could possibly affect this component during the construction and operation phase is emission of noise.

9.1.7.1 Impact Analysis

9.1.7.1.1 Construction phase

Construction activities will affect the ambient noise levels mainly through emissions of noise from the construction equipment and vehicles traffic.

Exact number of construction machinery cannot be estimated at this phase of the project. For the purpose of assessment for the worst case, maximum amount of machinery and equipment is located in the project area and this scenario is modelled where all noise sources are working at the same time. The noise modelling details are given in APPENDIX M.

Based on the calculations, the highest noise level in the residential region is about 62 dBA at north of the project area as shown in below figure. This result complies with the 70 dBA limit. The actual noise levels at Project Site is expected to be lower than the calculated value since all equipment/machinery will not be

operated at the same time in the project area and natural noise barriers like trees, vegetation or meteorological conditions will prevent noise to be dispersed.

As described under the baseline results in section 8.1.8 and APPENDIX M, N(24)-4 is the nearest measurement location to the point where the highest noise level is calculated. Day time noise levels measured at this location are 67.5 dBA (09:00 – 17:00) and 67.4 dBA (07:00 - 22:00). Hence, calculated noise level is not greater than the baseline level and will not create additional noise higher than the regulatory limit.

9.1.7.1.2 Commissioning and operational phase

Only project unit having possibility to create noise is the trigeneration plant with an estimated maximum installed capacity of 4 MWt, described in Section 4.2.1. Estimated noise level of the trigeneration plant is 92 dBA according to the from library of SoundPLAN Essential 3.0 software[26]. As compared to the construction phase model results, operation phase noise level in the surroundings will be much lower and no exceedances in relation applicable standards are expected in the ambient noise levels.

The noise to be generated during Project operation is expected to be caused by the emergency generators, helicopter movement and ambulance movements, in case of an emergency situation and the Regulation on Assessment and Management of Environmental Noise provides noise limits for health areas as presented in Table 13 and ambient noise level standards in IFC General EHS Guidelines is given in Table 14. As it is observed in, baseline results are mostly higher than these limits and it can be concluded that any long term noise effect to the baseline will not be observed in the residential areas because of above mentioned project activities.

During the public participation and disclosure meeting, there were no complaints raised on the possible helicopter sound. The other way round, lots of participants stated that there should be helicopter services during the operation phase.

9.1.7.1.3 Decommissioning/Closure phase

Exact decommissioning time and details of the work are not known at this phase of the project. It is assumed that decommissioning phase of the project will not generate higher noise levels than calculated noise levels in the construction phase of the project. Similar machinery with construction phase will be used in decommissioning activities; therefore the noise impact of the decommissioning will be similar to impact of construction phase.

9.1.7.2 Mitigation measures

During the construction stage, provisions of the “Regulation on Assessment and Management of Environmental Noise” and “Regulations on Work Health and Safety" will be followed with the purpose of protecting health of employees with respect to noise. Accordingly:

- appropriate personal protective equipment and materials such as helmet, ear protector or ear plug will be provided to protect workers from noise.
- There would not be any construction activities during the night time.

The following control measures recommended by IFC will be applied where possible:

- selection of equipment with lower sound power levels;
- installing silencers for fans;
- installing suitable mufflers on engine exhausts and compressor components;
- installing acoustic enclosures for equipment casing radiating noise;

[26] Power Stations (Generator Turbine Room)

- installing vibration isolation for mechanical equipment;
- limiting the hours of operation for specific pieces of equipment or operations, especially mobile sources operating through community areas;
- reducing project traffic routing through community areas wherever possible; and
- developing a mechanism to record and respond to complaints.

In addition, regular maintenance will be made for the construction equipment to ensure decreasing the possible high noise levels generated by the equipment.

No additional mitigation measures are proposed during the operation phase.

9.1.7.3 Residual Impacts

9.1.7.3.1 Construction phase

The residual impacts on the noise component after the application of the above mentioned mitigation measures are (See Section 9.1.7.2 for details).;

Table 25: Residual impacts on noise component

Construction phase	Commissioning and operational phase
negligible	negligible

9.1.7.4 Monitoring

A monitoring programme (which will also include the weekend day measurements) of noise at the closest sensitive receptors during construction and the commissioning and operational phase will be in place.

9.1.8 Traffic and Infrastructure

9.1.8.1 Impact Analysis

9.1.8.1.1 Construction phase

During construction phase impacts will be mainly associated to the impact factor increased road traffic.

The project actions related to the abovementioned impact factor are the surface levelling and grading, the transport of construction material, the construction of the facilities and the disposal of waste deriving from construction.

The activities related to the construction phase will require the movement of trucks entering and leaving the project area for the transportation of machinery, equipment, construction material (e.g., concrete, building materials) and staff.

The expected traffic increasing on the access roads to the project area will be of 40 trucks per day for 24 months. Another key factor to take into account is the size of containers and the maximum size of abnormal loads that will access the site via the existing access roads. Although the exact number of abnormal loads is not known at the writing time, it is assumed that they will be kept to a minimum as far as reasonably practicable and therefore their impacts are judged to be of minor significance.

The traffic road increasing could cause the boost of crashes and the congestion of the access roads especially closeness to the adjacent intersections. It is assumed that the routes which will be used for the road passages will mainly use O-30 highway.

Furthermore the road traffic increasing could lead to accidental wildlife losses, especially reptiles crushing.

The trucks and vehicles for the transportation of machinery, equipment, material and staff will leads to the potential for nuisance to nearby settlements due to the increase of air pollution (e.g. emissions of particulate matter, nitrogen oxides). Moreover, the new flows of trucks and vehicles will cause the increase of noise along the access roads to the project area.

9.1.8.1.2 Commissioning and operational phase

Further to the transportation of raw materials, products and personnel during the commissioning and operational phase is expected an increase of traffic.

The operation of the Project will generate solid waste which will be collected by a licenced waste carrier for disposal. It has conservatively been estimated that approximately 30 vehicles per month will transport the waste generated during operational phase.

The access to the İzmir Bayraklı IHC will take place by its south side, the lower elevation, from the service road of the O-30 highway. In each access point, it should be required to make the roundabouts with two-lane for both directions on this service road, since it is a four-lane road.

In general commissioning and operational activities could have an impact on traffic and infrastructures similar to the construction phase. Therefore the traffic road increasing could cause increase in traffic incidents, the congestion of the access roads and their adjacent intersections, road safety interference, air pollution and noise and potential for collisions with wild animals, especially reptiles.

9.1.8.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and the future use of the Project site and surrounding areas is unknown, it is not possible to discuss the details of decommissioning activities at closure. This discussion will start in a second moment, once closure objectives are clearer.

9.1.8.2 Mitigation measures

The mitigation measures listed in the following will be effective for both the construction and the commissioning/operational phases:

- Scheduling of traffic to avoid peak hours on local roads;
- Adopting best transport safety practices with the goal of preventing traffic accidents and minimizing injuries suffered by project personnel and the public;
- Adopting traffic control and operations devices (e.g. Add traffic signals to reduce speed limit, flashing arrow signs, add deceleration/acceleration lanes, improve sight distance) to guide drivers clearly and safely along the access roads to the project area. Effective traffic control increases safety and capacity and reduces stress for drivers;
- Reducing and make safely the pedestrian road crossing;
- Emphasizing safety aspects among project drivers, specifically ensure drivers respect speed limits through built areas and urban centres;
- Regular maintenance of vehicles should be undertaken to ensure that vehicles are safe and emissions and noise are minimized;
- Ensure contractors regularly maintain vehicles to minimize potentially serious accidents caused by for example, brake failure commonly associated with loaded construction trucks. Fuel systems of the vehicles that will be used within the scope of the project shall be controlled permanently and should comply with the national and international good practices.
- The fuel system of the vehicles shall be controlled permanently and it shall be complied with the provision of the regulation on the control of exhaust gas emission published on 04.04.2009 in official gazette no. 27190.

- Further mitigation measures are discussed in 10.5.3.1.

9.1.8.3 Residual Impacts

The residual impacts on the traffic component after taking into account the application of the abovementioned mitigation measures are (See Section 9.1.8.2 for details).;

Table 26: Residual impacts on traffic component

Construction phase	Commissioning and operational phase
negligible	low

9.1.8.4 Monitoring

Monitoring activities are required to verify the effectiveness of the mitigation measures proposed. They are listed below and are provided in the ESMP with frequency and timing:

- Investigation of the incidents and accidents and use of lesson's learned to improve traffic mitigations.
- Driver education monitoring to ensure it takes place.
- Comments and/or complaints received from ongoing consultations or from grievances to improve traffic mitigations.
- Feedback from local stakeholders regarding to any perceived changes in noise impacts and air quality changes linked to heavy traffic.

Monitoring should in particular be designed to identify failure or ineffectiveness of mitigation measures in terms of road safety and nuisance prevention.

9.2 Biological components

9.2.1 Terrestrial Flora and Vegetation

9.2.1.1 Impact Analysis Results

The vegetation present in the LSA was assessed as a low sensitivity component, considering that most of the areas are urbanized or disturbed by anthropogenic activities, in addition no endemic or protected flora species were found in the area.

Impact factors that could possibly affect the presence of terrestrial flora species during the construction phase are:

- vegetation clearing and disturbance of terrestrial top soil;
- pollutant and dust emission in the atmosphere.

Impact factors that could possibly affect the presence of terrestrial flora species during the operational phase are:

- occupation of land;
- pollutant and dust emission in the atmosphere.

9.2.1.1.1 Construction phase

The vegetation present within the footprint will be cleared for the construction of the facilities. This direct impact on vegetation will be important but localized and concentrated in a short time. The impact is considered reversible since, if left to itself, in the long term, the area will likely be recolonized by Mediterranean maquis vegetation.

Activities like rock fragmentation and surface levelling and grading during site preparation, temporary stockpiling of resulting material, transportation of soil and construction materials will cause emission of dust and pollutant (mainly NOx e CO2) in the air. Dust and pollutant will than precipitate on the surrounding area. Although local and reversible in the short term, this impact is likely to affect the surrounding vegetation with a medium intensity, in absence of any mitigation measures.

In particular dust emission, could impact vegetation directly by covering leaf surface and indirectly by through effects via the soil (Farmer A.M., 1993). Dust can block stomata of leaf surface, affect the photosynthesis, respiration, transpiration, and may cause leaf injury symptoms. As a result of that the productivity of the plants could decline and with the consequent reduction in vegetation growth, abundance and species loss.

The great majority of the excavated material will be reused on site only about 10% will be disposed of site in Gökdere or Belkahve region.

9.2.1.1.2 Commissioning and operational phase

The presence of the facilities will cause a loss of potential habitat for flora species within the project footprint during operation. The impact will be limited to the facilities since the surrounding areas temporary occupied by stockpiles, yards etc. will be restored after construction.

Dust and air pollution deriving from road traffic and operation of the facility, including the gas Trigeneration plant and the backup generators, could impact the terrestrial flora present in the surrounding area. In this phase the intensity of this impact factor is expected to be negligible, since all the areas not covered by the facility will be re-vegetated and the traffic limited to the normal operation activities of the hospital.

9.2.1.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and the future use of the Project site and surrounding areas is unknown, it is not possible to discuss the details of decommissioning activities at closure. This discussion will start in a second moment, once closure objectives are clearer.

Decommissioning activities could impact terrestrial flora. However, the impacts are expected to be limited, since the area will be already urbanized, and depend on the future use of the area. Potentially, if the site is restored to natural vegetation, this phase is expected to have an overall positive impact on terrestrial flora.

9.2.1.2 Mitigation measures

The mitigation measures here listed will be effective both for the construction and the operational phase:

- Project footprint will be minimized to the smallest extent possible in order to meet and support the Project works and activities;
- inadvertent disturbance to the adjacent vegetated areas should be avoided through clear demarcation of the Project Site boundaries, particularly in Mediterranean shrubland habitat types;
- dust control measures will be implemented along roads, in areas of excavation and earthworks and for stockpiles and spoil heaps, as described in Section 9.1.6;
- progressive reclamation of areas cleared during construction but not subjected to the placement of facilities will occur, with the goal of producing a stable vegetative cover to minimize erosion from air and water and to produce visual and ecological advantages;
- Suitable areas of the site should be re-vegetated after construction is completed. Grass and decoration plants should be used in locations such as the office and directorate building and evergreen young plants could be used in more distant locations away from buildings. Existing flora of the region should be considered in selecting plant species to be used and species known for their potentiality to become invasive will not be used.

9.2.1.3 Residual Impacts

The residual impacts on the flora and vegetation component after the application of the abovementioned mitigation measures are (See Section 9.2.1.2 for details).;

Table 27: Residual impacts on flora and vegetation

Construction phase	Commissioning and operational phase
low to negligible	negligible

9.2.1.4 Monitoring

Periodic surveys will be performed during construction to ensure that:

- areas characterized by natural vegetation around the construction site are not inadvertently impacted by equipment, temporary disposal of construction material or soil erosion due to nearby cleaned areas;
- progressive reclamation of areas cleared during construction but not subjected to the placement of facilities is performed ant it is coherent with the plan.

9.2.2 Terrestrial Fauna

9.2.2.1 Impact Analysis Results

According to the baseline study this component has a medium sensitivity. The area has some natural habitat with high fauna value (natural Mediterranean maquis) and it is situate in proximity with key biodiversity areas and an Important bird area. Populations or individuals of the fauna species that could occur in or visit the LSA are already impacted by anthropogenic disturbances, therefore the stable presence of sensitive species in the LSA is considered improbable. In addition, no Critically Endangered (CR) and/or Endangered (EN) endemic and/or restricted-range species were observed in the area (IFC 2012).

Impact factors that could possibly affect the presence of terrestrial fauna species during the construction phase are:

- vegetation clearing and disturbance of terrestrial top soil;
- pollutant and dust emission in the atmosphere;
- emission of noise and vibrations;

Impact factors that could possibly affect the presence of terrestrial fauna species during the operational phase a are:

- occupation of land;
- pollutant and dust emission in the atmosphere;
- emission of noise and vibrations.

9.2.2.1.1 Construction phase

The local fauna will be directly or indirectly impacted by the vegetation clearing and top soil disturbance activities performed during site preparation. In particular, species characterized by low mobility are not able to move ahead of construction (e.g. insects, amphibians, and tortoise). The removal of vegetation will also involve the destruction of suitable habitats for many fauna species.

Emission of dust and pollutant (mainly NOx e CO2) in the air and its consequent fell to the ground could affect vegetation communities and therefore indirectly also the fauna species that depend on them for food and refuge.

The emission of noise is expected to be of particular high intensity during construction, especially in correspondence of rock fragmentation activities, although limited in time. All construction activities such as operation of diesel engines, transportation of construction materials etc. are also expected to produce

noises. The emission of noise could impact local fauna, and in particular sensitive taxa like birds, especially during nesting season. Most of fauna species, including birds tend to habituate to constant steady noise levels, even of a relatively high level, in the order of 70 dBA. However sudden and discontinuous loud noises will scare away many fauna species from the area surrounding the construction site. The impact is expected to reversible in the short time, since fauna species will likely return once the noises are ceased.

9.2.2.1.2 Commissioning and operational phase

Previous fauna habitats will by occupied by the project facility and infrastructures during the operational phase. Moreover impacts such as dust, air pollution and noise emission could affect local fauna also outside the immediate project footprint.

In particular, dust and air pollution during the operation of the project could derive mainly from road traffic and operation of the facility, including the gas Trigeneration plant and the backup generators. During this phase the intensity of this impact factor is expected to be negligible, since all the areas not covered by the facility will be re-vegetated and the traffic limited to the normal operation activities of the hospital

Noise emission deriving from operational activities, including road traffic, operation of the facilities could have an impact on terrestrial fauna. However, considering the expected noise levels and the fact that most of fauna species, including birds tend to habituate to constant steady noise levels, even of a relatively high level, the impact is expected to be of relatively low intensity.

9.2.2.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and the future use of the Project site and surrounding areas is unknown, it is not possible to discuss the details of decommissioning activities at closure. This discussion will start in a second moment, once closure objectives are clearer.

Decommissioning activities could impact terrestrial fauna. However, the impacts are expected to be limited, since the area will be already urbanized, and depend on the future use of the area. Potentially, if the site is restored to its natural state, this phase is expected to have an overall positive impact on terrestrial fauna.

9.2.2.2 Mitigation measures

The mitigations described in the flora assessment to minimize impacts to natural vegetation (paragraph 9.2.1.2), will also indirectly have a positive effect on fauna, by protecting fauna habitat (e.g. minimization of the footprint to the smallest extent possible, dust control measures, avoid inadvertent disturbance to the adjacent vegetated areas, progressive reclamation of areas cleared during construction but not subject to the placement of facilities).

In addition, during construction an ecologist appointed by the contractor in charge of construction will briefly survey areas of natural vegetation prior to rock fragmentation and vegetation clearing. The survey will focus on nesting species that fall into protection categories and on fauna species with limited mobility the cannot move ahead of construction (e.g. tortoise). If any of these species is noted, specific mitigation measures will be implemented to ensure that all applicable regulations are complied with (e.g. translocation of the individual/nest to nearby undisturbed similar site).

Rock fragmentation activities will be performed outside the pick season for nesting birds that in the area goes from March to May.

Awareness will be developed among employees and contractor working on site about the protected species potentially present in the area, in order to ensure a constant monitoring and promote the reporting of incidental observations.

Moreover, with specific reference to the possible presence of nationally listed species during construction, instructions will be given to employees and contractors in order to prevent harming fauna species that might be present. In particular, BERN Convention conservation measures and provisions of 6th article, specified in Appendix II, will be considered and remembered to contractors during the construction:

“In respect of specially protected fauna species (Article 6), following acts are strictly forbidden:

- all forms of deliberate capture and keeping and deliberate killing;
- the deliberate damage to or destruction of breeding or resting sites;
- the deliberate disturbance of wild fauna, particularly during the period of breeding, rearing and hibernation, insofar as disturbance would be significant in relation to the objectives of this Convention;
- the deliberate destruction or taking of eggs from the wild or keeping these eggs even if empty".

9.2.2.3 Residual Impacts

The residual impacts on the fauna component after the application of the abovementioned mitigation measures are (See Section 9.2.2.2 for details);

Table 28: Residual impacts on fauna

Construction phase	Commissioning and operational phase
low to negligible	negligible

9.2.2.4 Monitoring

No specific monitoring activity is considered necessary for terrestrial fauna.

9.2.3 Habitats and Biodiversity

9.2.3.1 Impact Analysis Results

The main habitat present within the LSA is Mediterranean maquis (57% of the LSA in total) characterized by rock outcrops. Other types of habitats present are garden and agriculture and urbanized areas. A small pond and two streams are also present. The habitats and biodiversity are impacted by the anthropogenic disturbances, however, considering the condition of the overall areas and the proximity of key biodiversity areas, the component is considered as medium sensibility.

Impact factors that could possibly affect the presence of terrestrial habitat types during the construction phase are:

- vegetation clearing and disturbance of terrestrial top soil;
- pollutant and dust emission in the atmosphere;
- emission of noise and vibrations;
- introduction of alien species.

Impact factors that could possibly affect the presence of terrestrial habitat types during the operational phase are:

- occupation of land;
- pollutant and dust emission in the atmosphere;
- emission of noise and vibrations.

9.2.3.1.1 Construction phase

The habitat present within the project footprint will be directly impacted by vegetation clearing and disturbance of terrestrial top soil. Habitat present in the buffer area outside the project footprint could also be

impacted by emission of dust and pollutant and indirectly by emission of noise (through changes in fauna communities).

The dominant habitat present within the footprint is in the Mediterranean maquis (79% of the footprint re-forested maquis, plus 20% natural maquis). These habitats are all heavily disturbed by and urbanization, grazing, discharge of construction waste, pollution. In addition most of the area within the footprint has been reforested with the exotic species eucalyptus (*Eucaliptus* sp.) tougher with *Cupressus sempervirens* and *Pinus* sp.

The best preserved Mediterranean maquis present in the LSA is found within the 1 km buffer area at higher elevation, north of the Project site. The artificial pond and the one of the streams are also found on the buffer area outside the project footprint.

Table 29: Habitat types within the footprint, buffer and their sum (total LSA)

Habitat Type	Footprint (ha)	Footprint (%)	Buffer (ha)	Buffer (%)	Total LSA (ha)	Total LSA (%)
re-forested Mediterranean maquis	49.49	79	114.04	17	163.53	23
Mediterranean maquis	12.43	20	229.41	35	241.84	34
pond	-	-	0.38	<1	0.38	<1
stream	0.39	1	10.98	2	11.37	2
garden and agriculture	-	-	38.03	6	38.03	5
urbanized	0.24	<1	260.77	40	261.00	36
Total	*62.55*	*100*	*653.59*	*100*	*716.14*	100

Another potential impact is the accidental introduction of invasive alien species, and in particular of flora species. Soil disturbance and reduced forest cover facilitate invasion by exotic (non-native) species. During construction, temporary stockpiling of the material and movement of top soil could create favourable condition for the spreading of exotic plant species. This species tent to have an advantage in disturbed ecosystem, and if they penetrate in an habitat they can potentially change it functionality and species composition.

9.2.3.1.2 Commissioning and operational phase

During the operational phase, part of the areas disturber within the footprint will be restored and re-vegetated, however some areas will occupied by project facilities for the long term.

Dust and air pollution during the operation of the project is expected to be negligible, since all the areas not covered by the facility will be re-vegetated and the traffic limited to the normal operation activities of the hospital.

Noise emission during operation of the facilities could have an impact on terrestrial habitats, particularly in regards to fauna and bird habitats. However, considering the expected noise levels and the fact that most of fauna species, including birds tend to habituate to constant steady noise levels, even of a relatively high level, the impact is expected to be of relatively low intensity.

9.2.3.1.3 Decommissioning/Closure phase

Given that closure will not occur for at least 25 years and the future use of the Project site and surrounding areas is unknown, it is not possible to discuss the details of decommissioning activities at closure. This discussion will start in a second moment, once closure objectives are clearer.

Decommissioning activities could impact habitat and biodiversity. However, the impacts are expected to be limited, since the area will be already urbanized, and depend on the future use of the area. Potentially, if the site is restored to its natural state, this phase is expected to have an overall positive impact on the component.

9.2.3.2 Mitigation measures

Mitigations measures described in the previous assessments for terrestrial flora (9.2.1.2) and fauna (9.2.2.2), will directly or indirectly contribute to mitigate the impacts on habitats as well.

In addition, during the construction phase, the presence and diffusion of invasive flora species will be regularly monitored during construction and with particular attention to temporary disturbed areas during the first stages of reclamation.

In case the diffusion of invasive species is observed, an eradication program will be put in place.

9.2.3.3 Residual Impacts

9.2.3.3.1 Construction phase

Table 30: Residual impacts on fauna component

Construction phase	Commissioning and operational phase
low	negligible

9.2.3.4 Monitoring

The presence and diffusion of invasive exotic flora species will be monitored in disturbed area/s annually by an ecologist appointed by the contractor in charge of construction during the construction phase and during the first 2 years during the operational phase. Findings of the monitoring and incidental observation will be included in an annual report, in order to identified possible critical situation. If necessary, additional mitigation measures will be put in place.

9.2.4 Protected areas

9.2.4.1 Impact Analysis Results

The protected areas present within 20 km from the site are Örnekköy Tabiat Nature Park situated at about 5 km from the project site and Spil Dagi (Spil Mountain) National Park found at about 20 km Nord East. In addition also 3 key biodiversity area (KBA) and one Important Bird area (IBA) are present. The closest KBA is Yamanlar Dagi is situated in the proximity of the LSA Nord –Est. The IBA called Gediz Delta is situated about 8 km West of the site. The sensitivity of the component is considered high.

The main impact factor that could affect protected areas during the construction phase is:

- emission of noise and vibrations.

No impacts are expected during the operational phase.

9.2.4.1.1 Construction phase

The emission of noise due to rock fragmentation performed during site preparation activities is expected to be of particular high intensity. For this reason it could potentially affect highly sensitive receptors such as KBA and IBA (priority biodiversity features, EBRD 2014) even outside the boundaries of the LSA. The duration of the impact will be very limited duration but its influence could exceed the LSA. The effect of this impact could potentially impact particularly sensitive taxa like birds, leaving in protected areas within the RSA.

Sensitive taxa leaving in the Örnekköy Tabiat Nature Park situated at about 5 km from the project site could be potentially impacted, while the Spil Dagi) National Park at about 20 km is considered too far to experience any disturbance.

In addition the Important Bird Area (IBA) Gediz Delta is situated about 8 km West of the site could also be affected.

9.2.4.1.2 Commissioning and operational phase

No impacts are expected during this phase

9.2.4.1.3 Decommissioning/Closure phase

No impacts are expected during this phase.

9.2.4.2 Mitigation measures

Mitigations measures described in the previous assessments for terrestrial flora (9.2.1.2) and fauna (9.2.2.2), will directly or indirectly contribute to mitigate the impacts on habitats as well.

In particular, rock fragmentation activities will be performed outside the pick season for nesting birds that in the area goes from March to May.

9.2.4.3 Residual Impacts

Considering the application of mitigation measures, emission of noise and vibrations will have a negligible impact on protected areas.

9.2.4.4 Monitoring

No specific monitoring activity is considered necessary for this component.

9.3 Social Components

9.3.1 Socio-economic conditions and employment issues

9.3.1.1 Impact Analysis results on Project Affected People

9.3.1.1.1 Construction phase

Based on the qualitative analysis of the Project actions, impacts on the socio-economic conditions will be mainly due to the need of workers, primarily during the construction phase and to a lesser extent during the operation phase thus resulting influx of people to the project area and surroundings. The main reasons, impacts and management influx are dicscussed below.

The project construction is planned to last three years. The project will be executed by Special Purpose Vehicle (SPV) established jointly by GAMA Holding A.Ş. and Türkerler A.Ş.

The number of employees during construction will be changing over the construction period. The minimum number of employees will be 156 and maximum number of employees at peak level will be approximately 4000. The manpower histogram over the construction period is provided in Figure 24

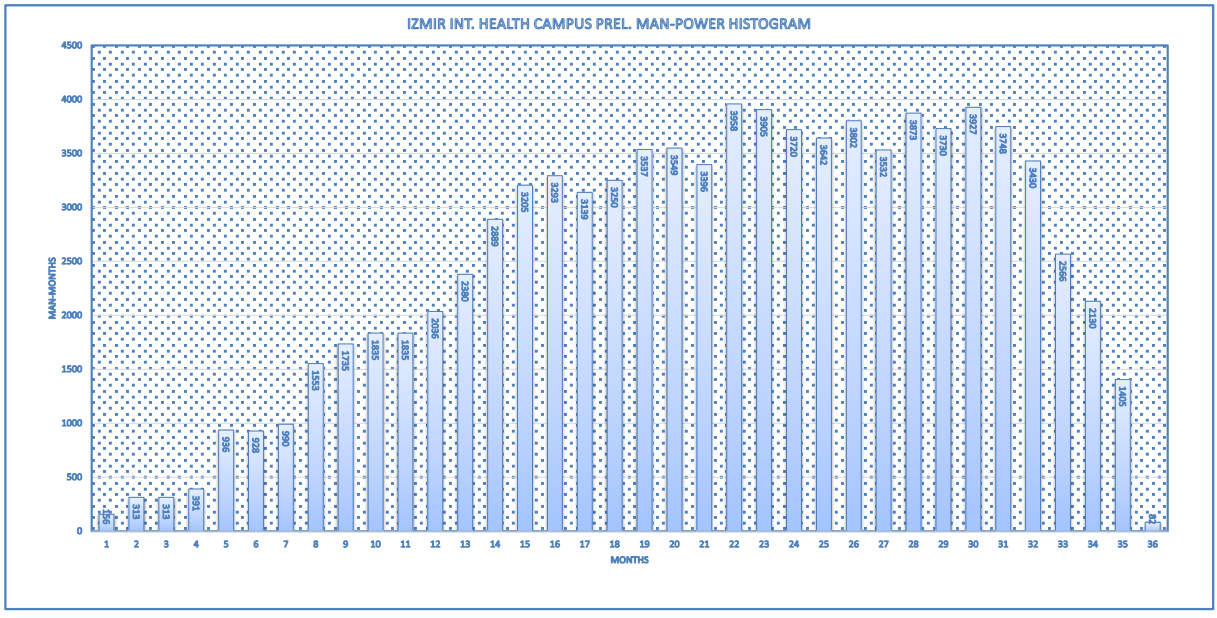


Figure 24: Manpower Histogram for construction phase

As part of the construction schedule there will be ongoing construction activities in the 537,546 m^2 of 622,530 m^2 the total project area for three years which will create potential impacts at the Laka Village and neighbourhood. These impacts would be related to;

- Provision of workforce and need for local procurement;
- Increase in real estate;
- Accommodation requirements for workers coming from outside Laka Village;
- Ongoing animal husbandry activities
- Dust and noise emissions;

Provision of workforce and need for local procurement

The need of workers during the construction phase, which will peak at about 4000 as mentioned above, will lead both to positive and negative impacts on the socio-economic context of Bayraklı. It is expected that part of the works will need to arrive from other areas of the Region, therefore leading to additional population living temporarily in Bayraklı during the construction phase though significant portion of the additional population will be accommodated in the construction camp. .

In particular the need of workforce can be considered a positive impact, because it brings work opportunities to the local and regional population. In addition the presence of workers and of a new facility will imply a use of goods and services, partly purchased locally, therefore leading to increased expenditures within the local economy.

There will be a need for the accommodating of the employees residing in outside of Bayraklı district and İzmir. SPV will establish a construction camp for the accommodation of the employees.

The need of workforce and the consequent immigration of workers can also lead to negative impacts on the social context. The presence of additional population in the area can cause an increased use of existing infrastructures, such as water, wastewater, roads, education and health facilities, which may not be able or designed to sustain such use levels. In addition, an increase in the population implies a need of more housing, which may not be readily available, due to the technical times needed from the construction market to build additional houses, leading to a housing deficit in the short term. In addition the presence of a large construction project and of a new facility can create in the local population expectations of job opportunities that might not be fulfilled locally by the company, leading to frustration and resentment in the local population.

Concerns have been raised by Laka Village residents during the interviews in relation to the employees accommodating close to the village. The village residents do not want the village surroundings to be return into a construction yard and request clear boundaries to be in place between the construction site and the village.

As stated by the Laka village mukhtar after the information on the construction of a health care facility has become public; the real estates prices increased.

Osmangazi village stated the expectations on increase in real estate prices.

The construction activities may create negative impacts on the economic activities in the region.

Though the construction of the Project facilities may be expected to create negative impact on the ongoing animal husbandry at Laka Village,

The following factors will be limiting the impact on animal husbandry in the village(referring to interviews);

- The younger generation in the village do not foresee themselves to be engaged in animal husbandry ;

- The legal status of the village has been changed to quarter and husbandry is not allowed in locations with this status
- The animal husbandry activities are in the form of live feedstock and no animal grazing is being performed.

Any disturbance on the exiting transportation routes to the village may result in loss of connection between the residents in the region coming to village to buy milk and the milk producers in the village.

9.3.1.1.2 Operational phase

Operation of the Project facilities will create potential impacts that would be related to;

- Provision of workforce and need for local procurement;
- Increase in real estate prices;
- Ongoing animal husbandry activities

In particular the need of workforce can be considered a positive impact, because it brings work opportunities to the local and regional population. In addition the presence of workers and of a new facility will imply a use of goods and services, partly purchased locally, therefore leading to increased expenditures within the local economy.

The number of the administration personnel planned for the operation phase of the İzmir Bayraklı Integrated Health Campus Project is estimated to be 2,159 in light of the existing information available at this stage. The details of the employment are given in the table below. The number of the medical personnel (doctors, nurses, etc.) will be added when it is available.

Table 31 Planned employment numbers

	Number of Personnel
Laundry	39
Cafeteria	225
Laboratory	76
Imaging	153
Sterilization	33
Rehabilitation	167
Waste Management	11
Cleaning- Room Cleaning	645
Hospital Information Management System (HBYS)	78
Security	235
Patient Guidance	301
Other Medical Support Services	25
Building and Land Services	64
Common Services	22
Furnishing	11
Garden Care Services	31
Disinfection	9
Parking Lot	34
TOTAL	**2,159**

It is expected that part of the employees (especially the unskilled and semiskilled) will be employed locally. Some part of the employees will come from outside of the Region, therefore leading to additional population living in Bayraklı and Laka village during the operation phase.

It has been stated during the interviews that there is already a workforce in the region employed at existing healthcare facilities. It is expected that these people will use the employment opportunities created by the Project during operation phase

The increase in the real estate prices estimated to happen with the start of the project is expected to continue during the operation phase

The information presented for the construction phase impacts on ongoing animal husbandry activities will be valid for the construction phase.

9.3.1.1.3 Decommissioning phase

Given that closure will not occur for at least 25 years and the future use of the Project site and surrounding areas is unknown, it is not possible to discuss the details of decommissioning activities at closure. This discussion will start in a second moment, once closure objectives are clearer.

9.3.1.2 Mitigation measures

The following mitigation measures will be in place in order to minimise the socio-economic and employment impacts originated by the project;

- Referring to Section 6.0 a continuous stakeholder engagement process and grievance mechanism will be in place
  - to exchange information on the project with the local community and other stakeholder and
  - to record and respond any complaints and concerns raised by the local community members and other stakeholders

  on the migration (influx) to the area as a result of project activities
- Maximizing of local employment and procurement in order to increase the positive socio-economic impact of the project on the local community
- Coordination with the local community for the arrangements of accommodation and establishment of the construction camps
- Consider cooperation with local authorities and local community members on minimising the potential negative impacts of the project on animal husbandry in Laka village through measures such as but not limited to;
  - not disturbing the access routes of the buyers of food of animal origin to Laka Village
  - locating construction camp away from animal feedstock barns;
  - scheduling and planning of construction activities in such a way that nuisance to the animal feedstock is minimised ;
- Provide guidance to the migrating population during operation for accommodation and living arrangments through human resources policy and plans.
- Preparation of the plans for
  - Construction Camp Management

- Human Resources Management
- Grievance Mechanism including employees

9.3.1.3 Residual impacts

If the above mentioned mitigation measures are adopted, they can play an important role in reducing negative consequences of the Project on the socio-economic context, particularly during the construction phase, which will be the most impacting. Moreover the Project can benefit the local economy both by offering job opportunities and by maximizing beneficial effects on the local economy. In addition adopting clear and transparent hiring procedures and continuous engagement with the local community on the construction planning will benefit the company's reputation among individuals and the local community, improving the general profile and relationships with the local community.

The following will apply to residual impacts with the adoption of mitigation measures;

Direction: negative

Duration (D): medium-short

Geographic extent (G): regional

Intensity (I): low

Probability of occurrence (P): low

Sensitivity (S): medium

The overall residual impact is considered to be negligible.

9.3.1.4 Monitoring

The activities for the monitoring of the residual impacts on socioeconomic conditions and employment are;

- The monitoring activities listed for the management of noise and dust emissions during constrıction are valid for this component;
- Monitoring of the implementation of management plans. Examples of monitoring parameters are but not limited;
  - Recorded and responded grievances and complaints
  - Local employment ratio
  - Percentage of procurement from local sources in the total procurement figures

9.3.2 Social Services and Facilities

9.3.2.1 Impact Analysis results

9.3.2.1.1 Construction phase

Any educational facility has not been identified in the impact area of construction activities. The nearest school is Trade Stock-Exchange High School which has 500ms of air distance from construction site and located at south of main İzmir Highway O-30.

No nuisance is expected to be created by dust and noise emissions from construction and construction related transportation activities.

9.3.2.1.2 Operation phase

The operation of the Bayrakli IHC project is expected to create positive impact in the region in terms increased quality of health services and the increased number of population having a easy access to health

services. The expected positive impacts of Bayraklı IHC on the local and regional community has been discussed in section 1.2

The opinions of the community members expressed during interviews and focus group discussions confirmed these expectations.

9.3.2.2 Mitigation measures

Although no major negative impacts are identified for this component, following general mitigation measure will be in place;

- Referring to Section 6.0 a continuous stakeholder engagement process and grievance mechanism will be in place
  - to exchange information on the project with the local community and other stakeholder and
  - to record and respond any complaints and concerns raised by the local community members and other stakeholders

9.3.2.3 Residual impacts

The residual impact on this component will be negligible.

9.3.2.4 Monitoring

Following general monitoring activities will be in place;

- Monitoring of the implementation of grievance mechanism with recorded and responded grievances and complaints

9.3.3 Infrastructure

9.3.3.1 Impact Analysis results

9.3.3.1.1 Construction Phase

The construction transportation routes have not yet been finalized.

Concerns have been raised by the Laka Village residents during the site interviews on the impacts to be created with the construction and operation transportation routes.

It has also been stated that the project would benefit from improvement of existing transportation routes.

The existing public waste collection infrastructure can be used to handle the construction wastes.

9.3.3.1.2 Operation Phase

It has been pointed out during the meetings, interviews and focus group discussion that;

- It has also been stated that the project would benefit from improvement of existing transportation routes.

As discussed in section 8.3.3.1, access to Bayraklı IHC by public transportation is by limited bus services. The use of existing public transportation by the public to access Bayraklı IHC may create bottleneck points on the public transfer routes to the site.

The existing public waste collection infrastructure can be used to handle the operation wastes.

9.3.3.1.3 Decommissioning phase

Transportation of patients from the close vicinity will be provided due to the maintenance and repair of the infrastructure.

9.3.3.2 Mitigation measures

The following mitigation measures will be in place to minimize the impacts of the project on the infrastructure;

- The transportation routes for the construction phase will be finalised through;
  - evaluating the conditions of the road whether being able to handle the v-construction vehicles loads and the traffic loads
  - selecting the routes with minimum social impacts and if required defining additional mitigation measures
  - coordination with the local authorities and community leaders.
- Local waste management authorities will be contacted to ensure the allocation of existing municipality resources and structures for the construction waste management
- The project site is accessible through the E87 (030) highway. In addition a detailed traffic study will be performed to define the final transportation routes with minimum impact on the existing traffic load and suggesting measures to improve the accessibility to Bayraklı IHC during operation.
- SPV will be in contact with local authorities to provide input on any future planning of the road and transportation in line with the developments in the area and maximize the benefit from future transportation network developments in the region.
- Local authorities will contacted during construction to confirm the utilisation of existing medical waste disposal facility for the operational medical wastes.

9.3.3.3 . Residual impacts

If the above mentioned mitigation measures are adopted, they can play an important role in reducing negative consequences of the Project on the existing infrastructure, particularly on waste handling and transportation. Moreover the Project can benefit from continuous engagement with the local community on the transportation planning and increase the company's reputation among individuals and the local community, contributing to the management of traffic related community health and safety issues, identifying sustainable transportation routes for construction and operation.,

The defining and confirmation of the waste disposal routes and arrangements with local authorities in a timely manner will contribute to the management of community health and safety issues arising from the disposal of construction and operation wastes especially medical wastes.

The following will apply to residual impacts with the adoption of mitigation measures;

Direction: negative

Duration (D): medium-long

Geographic extent (G): regional

Intensity (I): low

Probability of occurrence (P): certain

Sensitivity (S): low

The overall residual impact is considered to be negligible.

9.3.3.4 Monitoring

Monitoring plans that need to be produced at this stage would be reviewed under the authority of related ministries and grievance mechanisms. In order to establish of these plans, the list of environmental and social necessities need to be prepared. After, plans would be prepared are listed below:

- Environmental and Social Management Plan
- Camp Site Management Plan
- Occupational Health and Safety Management Plan
- Stakeholder Engagement Plan and Grievance Mechanism
- Construction Traffic Management Plan.

The applicability of these plan will be audited by independence third parties in 2 3 years.

The overall objective of the SEP is to explain how the SPV is planning to engage with stakeholders through the course of the Project.

Auditing of infrastructure works would be covered under the authority of related great or district municipality.

9.3.4 Cultural Heritage

According to the field work, no movable or immovable cultural assets were encountered within the Project area. However, there are two archaeological sites in the vicinity..

Although no cultural assets have been identified, in case of an encounter with a cultural asset during any physical intervention such as scalping, foundation excavation etc. in the Project area, it is recommended to cease all activities and inform the İzmir Archaeology and Ethnography Museum[27] as dictated by **"Article 4: Obligation to Inform of Law on Protection of Cultural and Natural Assets, Law No. 2863,"** and to proceed with the construction activities according to the decision of the Museum Directorate.

10.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM (ESMS)

Conformance Table – Environmental and Social Management System (ESMS)		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Environmental and Social Management Systems/ Establish and maintain a Social and Environmental Management System	PR 1	PS 1
Environmental and Social Policy/ Establish and manage mitigation and performance improvement measures and actions that address the risks and impacts	PR 1	PS 1
Organisational capacity and commitment/ Establish, maintain and strengthen an organizational structure that defines roles, responsibilities and authority	PR 1	PS 1
Organisational capacity and commitment/ Designate specific personnel, including management representatives with clear lines of responsibility and authority	PR 1	PS 1
Community Health and Safety Risks and adverse impacts to the health and safety of the potentially affected communities are identified and assessed and protection, prevention and mitigation measures are defined	PR 4	PS4
Labour and Working Conditions Minimum standards are defined for ensuring labour and working	PR2	PS2

[27] Halil Rifat Paşa Cad. No: 4 Bahribaba Parkı içi Konak – İzmir, Tel: 232 489 07 96 - 232 483 72 54
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conditions to be in compliance with project requirements		
Occupational Health and Safety Minimum standards are defined for ensuring occupational health and safety to be in compliance with project requirements	PR2	PS2
Health Services Consider the impacts on employees, patients and the immediate community	Sub-sectoral Environmental and Social Guidelines: Health Services and Clinical Waste Disposal	Environmental, Health, and Safety Guidelines; HEALTH CARE FACILITIES

10.1 Environmental and Social Management System Structure

The Environmental and Social Management System (ESMS) will ensure that the Project:

- complies with all applicable Turkish legislation as well as relevant IFI guidelines provided in the ESA;
- implements Good International Industry Practices (GIIP) to minimize potential environmental and social impacts during the construction, operation and decommissioning phases;
- is executed in compliance with the commitments addressed in the ESA for the minimization of potential environmental and social impacts;
- works in accordance with high standards of safety;
- cares for the protection of own employees and public;
- promotes its policies through training, supervision, regular reviews and consultation;
- generate local socio-economic benefits by using local and regional labour forces;
- engages and communicates with the local community and other stakeholders through a stakeholder engagement programme.

The ESMS addresses more in detail the following environmental and social aspects:

- Environmental aspects
- Labour Issues and public Health & Safety aspects
- Stakeholder management and social aspects

The ESMS included here is intended to describe the framework for the general management issues. This ESMS will be further developed as the project progresses .

10.2 Overall Environmental and Social Management System

The following mechanisms will be in place for the implementation of the ESMS.

10.2.1 Organization - Roles and Responsibilities

The **Project Management** will ensure that:

- the Project will be executed in line with the Environmental and Social Policy of the Project itself;
- the required resources are in place to implement the environmental and social mitigation measures identified in the ESA.

The HSE Engineer(s)/HSE Manager will supervise the overall environmental and social management activities associated with the Project at all phases of the Project. HSE Engineer(s) will be appointed in the beginning of pre-construction activities.

The role of the HSE Engineer(s)/HSE Manager will be to:

- supervise the implementation of the environmental and social mitigation measures identified in the ESA;
- ensure the ESMS and the associated management plans and procedures are further developed and detailed during the course of the project lifecycle;
- coordinate with Community Relations Officer the monitoring the stakeholder engagement activities being performed in line with the stakeholders programme and the public complaints are recorded and addressed.

The Community Relation Officer (CRO) is appointed for the overall implementation of the social management activities of the Project. He/she reports to the Management and is responsible for the implementation and operation of the SEP and in this respect acts as an interface between İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş., contractors, subcontractors and stakeholders. The CRO is responsible for implementing and organizing engagement activities described in this plan. The CRO is also responsible for monitoring the Plan implementation and for proposing corrective actions and reports to the Management. The CRO is furthermore responsible for:

- ensuring that this procedure is up to date and appropriate to the nature and scale of the Project;
- proposing to İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. management, if necessary, amendments and/or updates to this procedure and issuing revisions;

Community Relation Assistant (CRA): if deemed necessary, İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. will appoint one or more Community Relations Assistant(s), which will support the CRO in daily activities and duties. The CRA might be particularly important during the construction phase, as this is when Stakeholder Engagement related activities will peak. The CRA should be preferably employed from the local community, as this can ensure that he/she already has an established relationship with the community.

10.2.2 Risk Assessment and Risk Register

In order to identify and manage the project risks, a risk assessment study will be conducted in the beginning of the construction / pre-construction works and will be repeated at the beginning of each phase. The findings of this study will be taken into consideration and a detailed risk register will be prepared identifying the potential environmental, health & safety and social risks associated with the individual work items. The project has prepared an HSE risk assessment as presented in APPENDIX I. This will be a living document and be updated during the course of the project.

10.2.3 Training and Awareness

The project will ensure that:

- All personnel, including contractor's personnel, will receive a level of environmental and social training appropriate to their job functions.
- A training programme will be in place to include as a minimum but not limited to:
  - awareness of Project policies;
  - regulatory framework and conformance to the ESMP;
  - the potential environmental impacts associated with their jobs;
  - occupational health and safety;

- requirements of operational policies;
- spill response and emergency response programs;
- risk assessment.

10.2.4 Communication of Environmental and Social Issues

The system to communicate internally and externally regarding environmental and social issues are included in the stakeholder engagement activities.

10.2.5 Document and Record Controls

A document and record keeping procedure will be established to maintain the summary of all environmental and social activities and results. The records will include mitigation, monitoring and reporting needs, such as sampling, analytical data, incident reports, communications, etc.; and performance, training, communications and audits. These documents will be readily accessible for review and audit.

10.2.6 Corrective Actions

Procedures will be established to investigate any non-conformance with the requirements and necessary adjustment to correct and prevent further occurrence.

10.2.7 Inspections and Audits

A system will be established to conduct periodic audits of the environmental and social management plans, their effectiveness, implementation and maintenance.

10.2.8 Budget

Budgets will be established to meet the needs and requirements of the ESMS for the life of the Project. A refined budget will be established annually to address the tasks to achieve the requirements to address environmental and social management.

10.3 Environmental and Social Management Plan

10.3.1 Management Mechanism

A Site HSE Manager for the Project will be appointed in the beginning of the pre-construction activities to supervise the implementation of overall environmental and social mitigation activities defined by the ESMS.

10.3.2 Construction Phase

10.3.2.1 Contractor's Environmental and Social Management

Responsibilities of Contractors

The Contractor shall:

- comply with the relevant environmental requirements detailed herein and any other relevant local legislation;
- implement and demonstrate compliance with these requirements at all times;
- address the requirements of those applicable standards in the form of a Specific Project Work Instructions;
- prepare a construction ESMS in line with this ESMS (and associated management plans) and ESA and submit to the approval of İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. before the start of construction;
- ensure the subcontractors are aware and in compliance with the requirements of the ESA.

Personnel and Resources

The Contractor shall appoint an Environmental Representative ("ER"). The ER shall as a minimum:

- supervise the implementation of the Contractor ESMS;
- ensure that the all the Contractor workforce is communicated on the ESMS requirements;
- implement a training programme for the workforce;
- ensure a routine auditing and inspection programme is in place;
- the Contractor's appointed ER is responsible for internal environmental site audits and inspections;
- the ER shall be competent in understanding:
  - the Contract requirements;
  - contents of the risk register;
  - Contractor's ESMS and Policies;
  - relevant environmental management procedures; and
  - legal and other requirements.

Training and Communication

- A project site induction on Project environmental and social requirements shall be delivered to all Contractor employees.
- The Contractor's personnel shall receive environmental training appropriate to the environmental risks of the jobs/tasks they are delivering.

Inspection and Audits

Non-conformances and hazards identified by the Contractor during inspections shall be documented, addressed with appropriate corrective and preventive actions and communicated to İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. in timely manner.

Event Management

All Contractors shall report environmental events, near-misses and potential hazards within an agreed timeframe. The definition of the environmental events shall be documented and communicated to the Contractor's personnel. Environmental events shall include, as a minimum, actual events or near misses resulting in:

- a breach of legal & other requirements;
- environmental damage (e.g. over clearing);
- environmental pollution / contamination;
- impacts on flora, fauna, waters, heritage sites and atmosphere;
- unapproved discharge to air, land and water; and
- public complaints.

Corrective and preventive actions shall address the root causes of the event, and reduce the probability of event recurrence. Corrective and preventive actions shall:

- include the review and/ or revision of the risk register, relevant procedures and documentation;
- assess the effectiveness of corrective and preventative actions as part of the event investigation process, particularly for repeat events. The risk register shall be reviewed as part of this process.

Emergency Response

The Contractor shall:

- identify the events with a potential of significant environmental impacts and prepare appropriate response plans for the mitigation of such impacts. As a minimum the emergency response plan shall address events and impacts of:
  - major hydrocarbon and chemical spills,
  - natural hazards,
  - fire;
- provide adequate equipment and materials to effectively manage emergencies;
- demonstrate that such plans are or will be effective through personnel training and testing of the plan;
- develop post emergency plans which include a review of the effectiveness of the plan, its implementation, and the need for revisions.

Progress Tracking and Reporting

The Contractor shall:

- provide progress updates to Project Management on a weekly basis, as a minimum, which shall comply with reporting requirements as such:
  - environmental training topics and % employee attendance;
  - copies of ESM meeting minutes;
  - inspection / audit findings in the reporting period;
  - progress against completion of corrective actions;
- report the following items for the previous month, on the first day of each month:
  - performance against defined objectives and targets for management of significant risks;
  - amount of waste oil removed from the Site;
  - amount of contaminated soil generated and disposed;
  - amount and type of wastes generated and disposed;
  - area of land cleared;
  - visual water quality and depth to water level (where required);
  - volumes of wastewater generated;
  - any other reporting to local authorities.
- provide all environmental related documentation as requested.

Record Keeping

The Contractor shall:

- keep all the records and other relevant documentation to demonstrate compliance to Project requirements for the duration of the Contract;
- make records available during inspections and audits by Project Management.

10.3.3 Operation Phase

The appointed construction site HSE Manager during the construction of the Project will preferably continue for the operation phases. If not, a new HSE Manager will be appointed in the beginning of the operations to supervise the implementation of overall environmental and social mitigation activities defined by the ESMS.

The HSE Manager will be the point of contact for Project internal and external stakeholders.

In addition to the overall management system requirements described in Section 10.0, the Project will develop additional operational plan and procedures as part of the environmental management system. These will include the following, but not limited to ;

- Environmental Risk Identification and Assessment Procedure
- Compliance Management Procedure
- Waste Management Procedure
- Traffic Management Procedure
- Environmental Emission and Discharge monitoring procedure
- Hazardous Material Handling Procedure
- Resource Consumption and Resource Efficiency Monitoring Procedure

10.4 Social Management Plan

10.4.1 Management Mechanism

A Community Relation Officer (CRO will be appointed at the beginning of the pre-construction activities to supervise the implementation of overall environmental and social mitigation activities defined by the ESMS.

10.4.2 Stakeholder Identification

Stakeholders are individuals or groups who can affect, or are affected by, or have a legitimate interest in the Project results and performance. Some stakeholders are obvious, such as government authorities responsible for permitting and local communities adjacent to the Project. However, stakeholder identification intends to include other groups, organisations and individuals that may not appear to be directly involved. Health professionals and educators, for example, may be directly involved in the Project development, and are also familiar with the existing community and socio-economic dynamics and can help improve the quality of impact analysis. Such consultation also helps ensure that mitigation and social investment are coordinated with existing initiatives. Expanding stakeholder identification beyond government and local residents increases the likelihood that a wide representation of interests and opinions will be considered in the development of the Project.

In the case of the present Project stakeholders will be recorded in the following categories:

- governmental authorities at the national, regional and local levels;

- multi-national and international organizations (i.e., United Nations, World Bank Group, bilateral donors, etc.);
- non-commercial, non-governmental and public organizations at the international, national, regional and local levels,
- interest groups, such as universities and their foundations, cooperatives, local business establishments, business associations, chambers of commerce and others (i.e., labour, youth, religious, businesses, etc.);
- local communities;
- local businesses and potential Project contractors and suppliers;
- project, contractor and subcontractor employees; and
- media.

10.4.3 Stakeholder Engagement

A Stakeholder Engagement Programme has been planned with the following main objectives:

- continuously informing the local community about the Project-related development activities;
- ensuring that the local community is informed about the hazards associated with construction, operation activities of the Project and mitigation measures implemented by İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. to reduce impacts where possible;
- minimizing potential disputes between Contractor's and Subcontractors' and the local community;
- incorporating local knowledge during the entire Project life cycle, by taking into account bottom up information and feedback provided by local communities; and
- timely and effectively responding to community concerns regarding the issues such as employment of the local workforce reserve in the construction and operation phases, disruption to daily activities, safety issues, disturbances due to noise or dust, and other environmental and social issues.

10.4.4 Grievance Mechanism

The purpose of establishing the Grievance Mechanism is to provide indications on the procedure to be followed for the management of grievances that could arise due to construction and operation activities of the Project. The Grievance Mechanism is part of a broader framework represented by the Stakeholder Engagement, which sets the guiding principles and provides implementation tools to build strong relations with local communities. In this sense the Grievance Mechanism is a the key tool that allows the company to identify problems and to discover solutions together with the affected communities. The Grievance Mechanism aims at demonstrating responsiveness to stakeholder needs and to facilitate a trustworthy and constructive relationship with the stakeholders, by developing appropriate mitigation strategies.

The principles underlying the Grievance Mechanism are the following:

- transparency in grievance receipt and registration system;
- accessibility and culturally appropriateness, ensuring ease of access to community members;
- predictability based on a clear and known procedure, with time frames for each stage; clarity on the types of process and outcome it can (and cannot) offer; and means of monitoring the implementation of any outcome, maintained through effective disclosure of the mechanism;
- equitability ensuring fairness among aggrieved parties;

- confidentiality: all grievances received will be treated confidentially and will not be shared outside the company. Submissions will not be used in any way to intimidate the person or organization submitting the complaint.
- The Community Relation Officer and Community Relation Assistant (mentioned in Section 10.2.1) will be responsible of grievance mechanism. This mechanism have also been covered the patients, health employees and contracted workers.

The objectives of the Grievance Process will be to:

- provide affected people with ways and means of stating their complaints during the course of the project;
- establish a transparent and mutually respectful relation with communities;
- ensure that corrective actions are identified and taken;
- verify that affected people are satisfied with the corrective actions taken;
- avoid the need for judicial operation sanctions.

10.4.5 Monitoring and Reporting

The outcomes of the grievance mechanism procedures will be regularly reported both internally and externally.

In order to increase success of the grievance mechanism, all management staff must be aware of role and objectives of the procedure, to ensure that effective support is given to the CRO in the identification and implementation of grievance resolution actions. It is therefore essential that management and general staff are regularly informed on the grievance mechanism outcomes and performances.

With regards to internal reporting, the CRO will be responsible for liaising with management on a regular and on need basis, to inform on general progress of grievance mechanism and to seek for advice when needed.

10.5 Labour Issues and Health & Safety Management Plan

10.5.1 Labour Conditions

İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş. will prepare a Labour and Health & Safety Management Plan that will ensure the compliance with applicable Turkish legislation, Equator Principles, IFC and EBRD Guidelines and standards.

A labour / human resources management system will be established to manage labour rights, security and health issues. An employee grievance mechanism will be established during construction and operation phases. The employees will be informed on the grievance mechanism during recruitment.

Considering the present project characteristics and the information collected through impact assessment process following points will be considered and included as a minimum into the management system to be developed;

- The SPV (İzmir Bayraklı Hastane Yatırım ve Sağlık Hizmetleri A.Ş.) will promote equality of treatment and prohibit harassment in the workplace
- Employment decisions, such as recruitment, dismissal, promotion, will be transparent and will not be made (directly or indirectly) on the basis of personal characteristics such as sex, race, nationality, etc, but rather on the ability to do the job.
- Be in coordination with the local health authorities and association on developing the recruitment process

- The employees will be provided with a written contract. The contracts as a minimum will include information on terms and conditions of employment, including the period of employment, wages, hours of work, overtime arrangements, procedures for termination of the contract and any benefits. The contract will be in the native language of the employee and it will be clear and understandable to the employee. A copy of contract will be given to the employee.
- The copies of relevant human resources policies and any collective agreements will be readily available to workers
- Include provisions in the employee contracts to detailing the employment arrangements after the operation by PPP model has been completed and the management is handed over to public authorities. This will enable to minimize any potential negtive impacts on empolyee rights and benefits during the hand over process.
- There will not be forced labour and employees will be free to terminate their employment in accordance with national law
- The SPV management has not issued the subcontracts, yet. During the contracting process the existimng corporate procedyres of Gama A.Ş. and Türkerler A.Ş. will be referred to.
- The Health and Safety requirements and provisions will be included in the sub-contracts and employee contracts.
- The employees will be informed on the operation of PPP projects during recruitment process.
- The recruitment process will be transparent and will not have any discriminating
- Follow minimum age for employment of young persons in national legislation, and keep records of dates of birth verified by official documentation
- Young people will not be employed in hazardous work as defined by Turkish national legislation.
- SPV has a strict policy on not employing child workers.
- SPV and subcontractors must document and communicate terms of employment to workers, usually in the form of a written contract of employment
- In case of large redundancies a retrenchment plan will be prepared by the SPV.

In relation to the specific requirement for the accommodation provided in the construction camps following measures will, as a minimum, be in place;

- Policies and procedures on the quality and management of the accommodation and provision of basic services (either provided directly or by third parties) shall be established in line with IFC, EBRD WA GN[28] and implemented.
- Basic services requirements refer to minimum space, supply of water, adequate sewage and garbage disposal system, appropriate protection against heat, cold, damp, noise, fire and disease-carrying animals, adequate sanitary and washing facilities, ventilation, cooking and storage facilities and natural and artificial lighting, and dedicated medical services.
- Good standards in living facilities will be ensured in order to avoid safety hazards and to protect workers from diseases and/or illness resulting from humidity, bad/stagnant water (or lack of water), cold, spread of fungus, proliferation of insects or rodents as well as to maintain a good level of morale. Living

[28] Workers' accommodation: processes and standards Public guidance note by IFC and the EBRD, 2009

facilities have to be built using adequate materials and always have to be kept in good repair, clean and free from rubbish and other refuse. A list of main standards to be met (albeit not exhaustive) is presented below:

- Accommodation facilities will be provided with adequate heating, cooling and ventilation systems;
- Facilities will be provided with both natural and artificial lighting (e.g. window surfaces of 5%-10% of flooring surface)
- Workers will be guaranteed access to an adequate amount of free potable water for drinking and personal hygiene uses. Drinking water must meet national drinking water standards and its quality must be regularly monitored.
- Wastewater, sewage water and other waste materials will be disposed of according to national legislation.

- The location of facilities is important to prevent exposure to wind, fire, flood and other natural hazards. Worker's accommodation has to be unaffected by the environmental or operational impacts of the worksite (for example noise, emissions of dust) but is sufficiently close that workers do not have to spend undue amounts of time travelling from their accommodation to worksite.
- Rooms and dormitory facilities will be designed and built so that workers can rest properly and maintain good standards of hygiene. Rooms/dormitories will be kept clean and in good conditions, exposure to noise and odour must be minimized. Room/dormitory design should strive to offer workers a maximum of privacy and all facilities must be single sex. A list of main standards to be met (albeit not exhaustive) is presented below:
  - Rooms/dormitories are kept in good condition and cleaned at regular intervals
  - With regards to density, minimal floor space must be of 4-5.5 m2 per worker, with a minimum ceiling height of 2.1 m.
  - Each worker is provided with comfortable mattress, pillow, cover and clean bedding which are washed frequently.
  - Workers must be able to maintain a good standard of personal hygiene and contamination or spread of disease must be prevented through the use of adequate equipment and procedures. A list of main standards to be met (albeit not exhaustive) is presented below:
  - Sanitary and toilet facilities will be built in materials that are easily cleanable, and are cleaned frequently and kept in working conditions
  - An adequate number of sanitary and toilet facilities will be provided (at a minimum 1 unit for 15 people) and conveniently located in the same building as rooms and dormitories.
  - An adequate number of hand-wash and shower facilities will be provided (at minimum 1 unit for 15 people) and conveniently located in the same building as rooms and dormitories;
- Good standards of hygiene will be maintained in canteen/dining and cooking facilities. If caterers are contracted to manage kitchens and canteens, they must take into account and implement the same standards. A list of main standards to be met (albeit not exhaustive) is presented below:
  - Canteens will have a reasonable amount of space (minimum 1.5 m2 per person) and will be adequately furnished;
  - Kitchens will be designed, built and equipped so to maintain an adequate personal hygiene and to permit food hygiene practices, including protection against contamination.

- Safe and nutritious food will be provided to workers, in order to guarantee their wellbeing and productivity. The WHO 5 keys to safer food or an equivalent process will be implemented. Food served to workers will contain an appropriate level of nutritional value and will take into account religious/cultural backgrounds and needs.
- Access to adequate medical facilities and services is provided to workers; an adequate emergency response system must be put into place. See also Workers' Health Management Plan on Communicable Diseases.
- Basic leisure and social facilities will be provided to workers, in order to increase workers' welfare and to reduce the impacts of the presence of workers in the surrounding facilities. Basic collective social/rest spaces will be provided (e.g. multipurpose halls, TV rooms, etc.). In addition the contractor should consider providing recreational/sport facilities. Communication systems such as internet connection will be provided at an affordable or free cost.
- Security will be guaranteed to workers and their property (personal belongings) on site, in line with indications in the Security Management Plan.
- The accommodation services will be provided in a manner consistent with the principles of non-discrimination and equal opportunity. Workers' accommodation arrangements should not restrict workers' freedom of movement or of association. Workers' gender, religious, cultural and social backgrounds must be respected. Workers must be made aware of their rights and obligations and must be provided with a copy of the internal accommodation rules, procedures and sanction mechanism.
- Workers must be made aware of the Worker's Grievance Mechanism and know that any concern or complaint regarding accommodation may be submitted through the Worker's Grievance Mechanism.
- During the workers' accommodation design and planning process the Annex Checklist provided in the IFC and EBRD Guiding Notes on Workers' Accommodation must be followed to ensure that the document's requirements are met.

10.5.2 Occupational Health and Safety

A health and safety management system employing site and work specific health & safety procedures and instructions will be established. The procedures will include but not be limited to the following issues:

- General Health & Safety Procedures
- Specific Health & Safety procedures for hospital structures
- Personal Protective Equipment Usage
- Working at Height
- Fall Protection
- Working in Confined Space
- Hot Works
- Electrical Works
- Portable Appliances
- Lock Out Tag Out
- Procedures Related to Working Environment and Industrial Hygiene (noise, vibration, heat, etc)

10.5.3 Community Health And Safety

The community may be exposed to potential risks of health and safety associated with hazards created though the project activities and equipment, vehicles and infrastructure allocated for project use.

The section 9.0 on the assessment of potential impacts of the project on the environmental and social components provides a detailed discussion on the prevention and control of impacts on human health and the environment due to the release of pollution.

As an overarching attempt to control and minimise the community health and safety impacts SPV will;

- Cooperate with the project stakeholders through the engagement process detailed in the Stakeholder Engagement Plan while defining and implementation of the mitigation measures for the control of risks and impacts created by the project on the community health and safety.
- Prepare and accident and incident investigation procedure. This procedure will include the investigation process for the potential accidental events, injuries or diseases that may occur during the lifecycle of the project as a result of project related facilities. This procedure will also define the process for documenting the findings of the investigation and adopting measures for the prevention of reoccurrence.
- Inform and consult community members on specific project activities such as crossings, fragmentation and similar, they will be informed on the health and safety precautions and procedures through consultation meetings.
- Make sure all contractor and subcontractors will be informed on the requirements for ensuring community health and safety.
- Recruit or subcontract security personnel in order to ensure the security of the working areas.
- A Grievance Mechanism will be in place as detailed in Stakeholder Engagement for communities and individuals to formally communicate their concerns, complaints and grievances and facilitate resolutions that are mutually acceptable by the parties.

More specifically in line with the location and characteristics of the present project the following community health and safety risks are identified;

- Transportation related safety risks
- Waste management related health risks
- Management of camp and construction and communicable diseases
- Health risks induced through provision of health care services
- Infrastructure, building, and equipment design and safety

10.5.3.1 Transportation related safety risks

During both construction and operation of the project the transportation activities and thus the traffic load will be increased around Laka village and other settlements around the transportation routes.

A specific traffic study APPENDIX A has been prepared at the regional and project level for the definition of the best suitable traffic routes and the requirements of connections from existing roads to the project area.

An individual Traffic Management Plan will be prepared for construction and if required, operation phase of the project.

The Traffic Management Plan will include the measures for the minimisation of the transportation related safety risks. Nevertheless following mitigation measures as a minimum will be included in this Management Plan and will be implemented by SPV.

- Increased safety awareness among the Laka Village and other nearby settlement areas especially on the routes of transportation to the project area will reduce risk of accidents. Therefore, an awareness training will be delivered to community members including the adults and children in Laka Village and any other settlement area along the transportation routes for increasing the awareness on the project induced hazards (i.e. increased traffic, construction areas and similar).
- Community members will be informed and consulted for the location of the crossing points, they will be informed on the health and safety precautions and procedures through consultation meetings.
- Roads and intersections subject to intense construction traffic will be provided with additional mitigation measures such as traffic control, speed reduction systems, warning signals and informing drives on such hotspots.
- Transport during night-time will be avoided to the extent possible in order to prevent road accidents.

10.5.3.2 Waste management related health risks

- Wastes created during the construction and operation of the project would create health risks to the employees and community if not collected and disposed properly. An individual waste management plan has been prepared for the project and presented in Appendix XXX. As a minimum;
- All wastes will be segregated and recycling procedures will be set up;
- Domestic solid wastes will be disposed through licensed domestic solid waste disposal contractors identified through communication with the local authorities;
- Hazardous solid wastes will be disposed through licensed hazardous solid waste disposal contractors identified through communication with the local authorities;
- Medical wastes will be disposed through licensed medical waste disposal contractors identified through communication with the local authorities;
- Temporary site waste storage areas will be identified and arranged in compliance with local regulations.

10.5.3.3 Management of Camp and Construction Site

A construction camp will be established to accommodate the workers during construction. An individual Camp and Construction Camp Management will be prepared to include the mitigation measures for the minimisation of health and safety risks on the community through the operation of camp site.

As a minimum following measures will be in place during the operation of the camp sites;

- In order to avoid risks of accidents due to presence of construction site and construction activities, there will be fencing and additional warning signals to avoid trespassing. In addition local population will be informed about construction activities taking place through stakeholder engagement.
- Medical surveillance will be performed among its workers and ensure medical examinations are done for workers performing health critical activities (i.e. canteen workers and such).
- Bayraklı District Health Directorate and other relevant health authorities in the area will be liaised to agree on appropriate strategies and plans to mitigate the transmission of communicable diseases in settlements surrounding campsite.
- Campsites will be provided with health facilities equipped to deal with emergency procedures and routine medical operations.
- Workers will be subject to legal health screening before employment contracts are signed and if necessary will be provided with required immunisation treatments; all health information will be dealt with confidentially. They will be given health awareness trainings at routine intervals.

10.5.3.4 Infrastructure, building, and equipment design and safety

Based on the seismic zone classification of Turkey, İzmir Province is in the 1th degree seismic zone which is the most active zone in Turkey.(Refer to Section 8.1.2). This would increase the earthquake risk on the project area.

Project design and engineering should cautiously comply with the provisions of the "Regulation on the Buildings to be Constructed on Earthquake Zones" (06.03.2007 O.G. No: 26454). The parameters determined from geological and geotechnical investigations for the Project Area based on this regulation are:

- Building significance coefficient (I): 1.5
- Soil Type: B
- Local soil class: Z_2
  - Ground spectrum periods: T_A= 0.15 T_B= 0.40
- Effective ground acceleration coefficient (A_o): 0.40 (1st degree earthquake zone)

Other risks related natural hazards are addressed in Section 9.1.

The design, construction and operation of the structural components of the project will in compliance with national legislation and other applicable standards.

Before Bayraklı IHC is taken into operation a third part fire and safety audit/inspection will conducted by certified and competent experts.

10.5.3.5 Risks induced through provision of health care services

During the operation of Bayraklı IHC there will be production of medical and radioactive wastes.

If these wastes are not properly managed, they can pose significant health risks to the community. Specific waste management plan including medical/clinical wastes and radioactive wastes is presented in APPENDIX B

Operation of Bayraklı IHC will be in compliance with requirements of all the relevant regulations as described in section 3.0 and appropriate quality control and management systems will be implemented which would ensure the management of health and safety risks that would be imposed to patients, employees and community.

SPV will consider the assurance of emergency access to the IHC when developing the access routes to IHC and defining the emergency response and preparedness plan. As a minimum, there will be two possible access routes defined in case one of these routes is blocked or inaccessible in case of an emergency.

10.6 Treatment of Patients

An important consideration for the health services sector is the responsible and fair treatment of patients. In that respect to minimize the risks of malpractice, negligence and reputational damage the following issues should be ensured through the proper management mechanisms;

- Develop a comprehensive policy on governance and ethics covering all areas of risk (such as endorsement of drugs, non-discrimination of patients etc
- Ensure skills development of workers;
- Develop a comprehensive policy on governance and ethics covering all areas of risk (such as endorsement of drugs, non-discrimination of patients etc.);
- Develop a policy to address the concerns of the patient base
- Ensure state of equipment (age, level of maintenance, calibration) is fit for the services to be provided;

- Ensure the required capacity of the health care facility to provide services for the projected volume of patients;
- Develop a comprehensive system ensuring patient confidentiality.

10.6.1 Dual Management

Bayraklı IHC project has been executed as Pubic Private Partnership[29]. Though the SPV is the project sponsor and developing the project; during the operation phase there will be shared management responsibilities between the SPV (Project Company) and the Ministry of Health (Administration) defined by the Agreement between these parties. Dual management of Bayraklı IHC will result in shared responsibilities among these parties to ensure the above principles and requirements are in place.

The key points defined by this agreement relevant to the operation of the Bayraklı IHC are;

Each party agrees to co operate, at its own expense, with the other party in the fulfillment of the purposes and intent of this Agreement. Nevertheless, neither party shall be under any obligation to perform any of the other's obligations under this Agreement.

The Project Company shall perform its duties under this Agreement which include the designing and construction of the Facilities, the provision of the Services and the carrying out of the Commercial Activities, at its own cost and risk without recourse to the Administration except as otherwise expressly provided in this Agreement.

The Project Company have full regard for the safety of all persons on the Site (whether on the basis of a lawful right or not) in execution of the Operations under the Agreement, and keep the Site, the Works and the Facilities in an orderly state from the Site Delivery Date, appropriate in accordance with the provisions of Prudent Tradesman, to avoid any jeopardy to such persons, and take any kind of measures to prevent such jeopardy. Moreover, the Project Company shall comply, and shall procure that any of the Subcontractors comply, with any provisions relating to health and safety during the design and construction of the Works and the provision of the Services and performance of the Commercial Activities applicable to this Agreement under Turkish law.

The Project Company has no other medical or administrative liability other than those hereunder and in scope of the Schedules hereto.

The Project Company, unless the Administration gives its prior written consent, in no way whatsoever, carry out any work, procedure, design amendment or other modification in violation of the designs approved by the Administration.

Liabilities of Administration will include "carry out the supervision of the construction of the Hospital Facilities by itself or through an independent supervisor."

The Administration is responsible for procuring any kind of services which physicians, nurses and other personnel employed by the Administration are required to provide, including Clinical Services, and for their employment and payment of their remunerations and personal rights.

The Project Company shall in no way be responsible for the procurement of Clinical Services and their results. The Parties mutually agree upon interpretation of Schedule 14 (*Service Requirements*) in compliance with the principle which stipulates that the Project Company shall not be responsible for Clinical Services.

The Project Company shall not be responsible for providing Clinical Services or other services which must be provided by physicians, nurses or administrative personnel affiliated to the Administration, or consequences of such services.

[29] Public–private partnership (PPP) describes a government service or private business venture which is funded and operated through a partnership of government and one or more private sector companies.

The Project Company is obliged to provide the following Services:

a. Clinical Support Services:

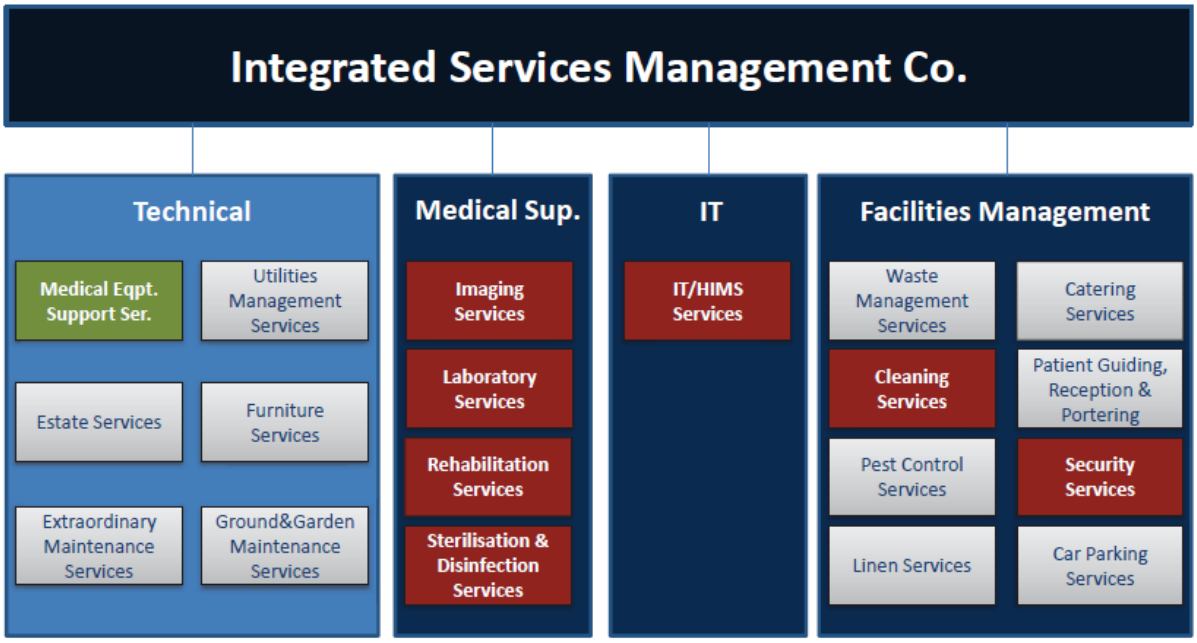
- Laboratory Services,
- Imaging Services,
- Sterilisation and Disinfection Services,
- Rehabilitation Services,
- Other Clinical Equipment Support Services.

b. Support Services:

- Estates Services,
- Extraordinary Maintenance (Life Cycle Replacement),
- Utilities Management Service,
- Furniture Service,
- Grounds and Gardens Maintenance Services,
- Cleaning Services,
- Hospital Information Management System (HIMS) Implementation and Operation Service,
- Security Services,
- Patient Guiding and Accompaniment / Reception/ Help Desk / Portering Services,
- Pest Control Services,
- Car Parking Services,
- Waste Management Services,
- Linen Services,
- Catering Services.

10.6.2 Patient Data Security

The following diagram presents the services to be provided by the SPV in the Bayraklı IHC.



During the execution of these services patient private data will be processed through the Hospital Information Management System (HIMS) Implementation and Operation Service to be provided by the SPV.

SPV will provide the continuity for the conformance of the offered HIMS services to the following rules and regulations;

- Conformance of national/internationally accepted communication, classification and medical informatics standards and/or norms.
- Conformance with the requirements defined in the rules, law and legislations of MoH.

In order to ensure the security of patient private data the HIMS will have the following features;

- HIMS should have full/comprehensive security infrastructure to prevent unauthorized access to the system. Since a lot of users' access different kinds of data in the system, the system must control their authority of changing or adding data to the system.
- The data security and reliability at user and operation levels should be provided within the whole system.
- Authorisation levels to access to the patient data will be defined by the SPV and the Ministry of Health.

Moreover; patient data security will also be protected by;

- Contractual obligation (between SPV and Ministry of Health)
- Legislative obligation
- In case of any lack of local legislation, the related EU directives (like 95/46/EC Data Protection Directive) will be followed by the SPV.

The main objectives of SPV with regards to forensic unit are:

- To avoid or minimize the risk and impacts on the halth and safety of the local community during the all phases of the project in all circumstances

- To ensure that the safeguarding of personnel is carried out in a legitimate manner that avoids or minimize risks to the community's safety and security
- To protect and promote the health and safety of workers by ensuring healthy and safe working conditions and impelenting e health and safety management systems

SPV will ensure the community's and workers safety by;

- Ensuring infrastructure and equipment safety
- Incorporate the health and safety considerations into the design, construction, operation and decommissioning of the project.
- Preventing and minimasing the potential for community exposure to hazardous material safety
- Preventing the community exposure disease safety
- Asses the emergency preparedness and response
- Identify, and monitor the traffic and road safety

SPV will follow the all requirements included in IFC Performans Standar 4 and EBRD Performance Requirement 4 as well as the local requirements provided below:

- Law about Private Security Services, Law No: 5188
- Turkish Private Security Standards, TS 12782, TS 15602

SPV will assess risks to, employees or contractors to provide security to safeguard its own personel and property, within and outside the project site posed by its security arrangements. In making such arrangements, the SPV will be guided by the principles of proportionality, good international practices in terms of hiring, rules of conduct, training, equipping and monitoring of such personnel, and applicable law (below requirements). The SPV will make reasonable inquiries to satisfy itself that those providing security are not implicated in past abuses, will train them adequately in the use of force (and where applicable, firearms) and appropriate conduct toward workers and the local community, and require them to act within the applicable law. The SPV will not sanction any use of force except when used for preventive and defensive purposes in proportion to the nature and extent of the threat. A grievance mechanism will also allow the affected community to express concerns about the security arrangements and acts of security personnel.

If government security personnel are deployed to provide security services for SPV, It will assess risks arising from such use, communicate its intent that the security personnel act in a manner consistent with above paragraph, and encourage the relevant public authorities to disclose the security arrangements for the hospital to the public, subject to overriding security concerns.

10.6.3 Forensic Hospital Services

The operation of the forensic hospital services will have the following challenges that would need specific engineering design and management considerations to mitigate the associated environmental and social risks;

- Community health and safety risks associated the accommodation of the prisoners with mental problems accommodated in the unit;

- Management system challenges; there is going to be a designated management system at the campus where the MoH will assign special health staff to the campus, while the Ministry of Justice ("MoJ") will only be responsible for the section of the forensic hospital where prisoners with mental problems will be accommodated.
- Management of security systems and services
- Treatment of prisoners with mental problems

In order to mitigate these risks the following measures will be in place;

- There will be security systems to eliminate the unauthorized entry and exit to the premises of the hospital. The systems would include;
  - Security forces
  - Building design with special security considerations; security zoning, high security, medium security and medical clinics
  - Security fencing ; a combination of walls, plants, doors and fences as appropriate with the security zoning
  - Electronic (Closed Circuit Television and similar) surveillance system
  - There will be Gendarme (10 personnel); outdoor security (they will not have an authorisation to enter the forensic hospital unit)
  - There will be 48 guardians (16 x 3 shifts); for prisoners (appointed by MoJ and unarmed)
  - There will be 48 private security guards (16 x 3 shifts); for check points and visitor information guidance. (they will not have an authorisation to interfere to the patients)
- There will be a stakeholder engagement and grievance mechanism system in place to ensure the information exchange between the community members in the neighbourhood, record and respond the concerns of these people.
- There will be communication mechanisms in place with community heads. The emergency response plan will include informing them in case of a security breech at the hospital.
- The hospital will be designed to accommodate 100 patients with mental problems. The hospital design will ensure the patient welfare and the security by allocating separate clinics for different gender types, open-air areas for patients and personnel, security provisions in line with security zoning, ensuring patient privacy when deciding on surveillance system design and similar.
- There will be close coordination and communication among Bayraklı IHC management, Ministry of Health, Ministry of Justice and Ministry of Interior for the operation of forensic hospital and provision of security forces.

11.0 CUMULATIVE IMPACTS

Conformance Table – Environmental and Social Management System (ESMS)		
Theme/Sub-Theme	**EBRD PRs**	**IFC PSs**
Cumulative Impacts Cumulative impacts of the project are considered during impact assessment process in combination with impacts from other past, existing and reasonably foreseeable developments as well as unplanned but predictable activities enabled by the project that may	PR 1	PS 1

Conformance Table – Environmental and Social Management System (ESMS)		
occur later or at a different location.		
Cumulative Impacts Potential adverse project impacts on existing ambient conditions are addressed The project-related impacts and issues associated with resource use, and the generation of waste and emissions are assessed in the context of project location and local environmental conditions	PR 3	PS 3

Cumulative impacts are defined as *"… those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones."* (IFC Good Practice Handbook: Cumulative Impact Assessment and Management).

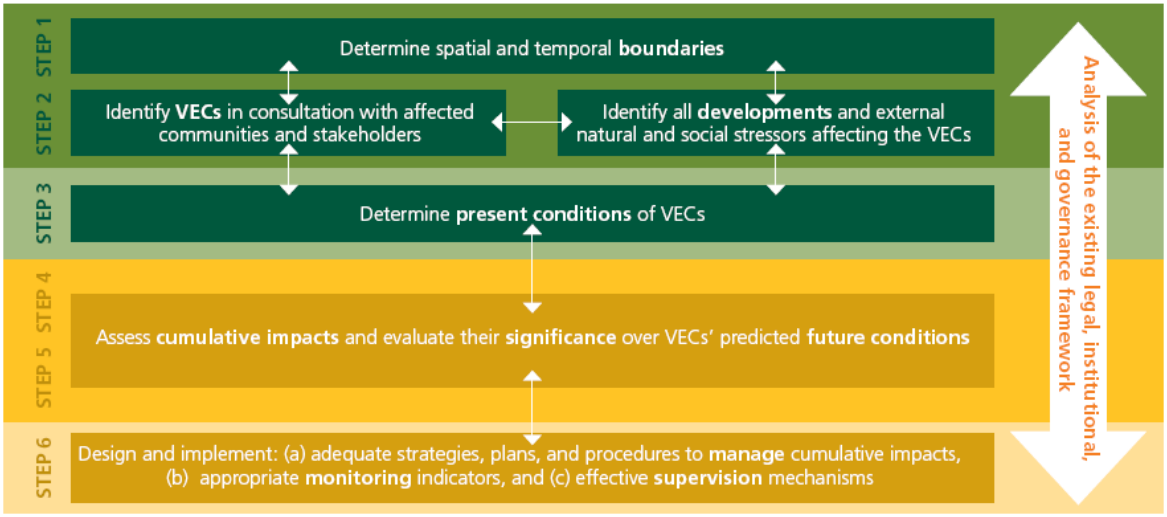
Cumulative impacts can result from various types of interaction among different impact factors:

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

In the context of the Bayraklı IHC ESAESA, the cumulative impacts mentioned at points 1 and 2 above have been accounted for in Chapter 9.0 addressing the potential impacts on the identified Valued Environmental and Social Components (VECs)[30]; this chapter describes the potential impacts identified in point 3 above.

The process followed for the assessment is consistent with the framework provided by IFC and illustrated in the figure below, as described in the following paragraphs.

[30] In the context of the discussion of cumulative impact assessments in this report Valued Ecosystem Components would correpsond to environmental and Socail Components as described in Section 7.2 of this report.



a) Spatial and temporal boundaries

The analysis of projects with potential cumulative impacts has been extended within the Social components Study Area that extends to neighbouring settlements to the Project Area including Bayraklı District. The projects considered were the projects likely to have a construction phase overlapping with the Bayraklı IHC project.

b) Valued environmental components identification

The VECs considered are the same considered for the Bayraklı IHC, as described in Section Appendix J and analysed in detail in Section 8.0 and 9.0.

c) Present condition of the VECs

The present conditions of the VECs has been analysed in the course of the baseline studies, whose results are described in Section 8.0. The Area of Influence (AoI) considered is sufficient to determine the present conditions in the areas where there is potential interaction between the Bayraklı IHC project and the other projects considered.

d) Significance of the Cumulative Impacts

The analysis of the potential cumulative effects has been carried out based on limited information collected from the relevant authorities, and public information and in particular without the knowledge of the construction timeline.

e) Definition of the mitigation strategy

The mitigation strategy has been identified at a preliminary level, given the lack of specific information available on the various projects considered, and it is based on further studies to be conducted during the pre-construction of the Bayraklı IHC. In general the strategy has the objective to follow the mitigation hierarchy of avoid, mitigate and compensate, and it is based on the coordination of activities between Bayraklı IHC or organizations and the authorities in charge of the other projects.

Çiğli Hospital

The construction of Çiğli Hospital in Çiğli District of İzmir is ongoing. The hospital will have 700 beds and expected to be in operation by the end of 2015. The hospital will be a public hospital. (http://www.ikkh.gov.tr/Haberler.php?id=189).

The construction area is away from Bayraklı IHC hospital and no concurrent impacts are foreseen in terms of construction impacts. Çiğli hospital is not expected to have a negative impact on the demand for the services

provided by Bayraklı IHC on the contrary is declared to be providing transitional support to the high demand on health care services in İzmir and surrounding region.

Bayraklı Urban Transformation Project Area

In the recent years, sections of Bayraklı District is included in the scope of Urban Transformation Project. As part of Bayraklı Urban Transformation and Development Plan, Residential and trading areas will be established. Location of The Urban Transformation Area in relation to the Project Area location is presented in Figure 25

Figure 25: The Location of the Urban Transformation Project Area and the Project Area

The impact on the existing transportation infrastructure in terms of increased traffic load should be considered together with Bayraklı IHC project.

Katip Çelebi University Campus

A new education campus of Katip Çelebi University is planned in the north of Bayraklı IHC to be starting educational facilities by 2018-2019.

Local authorities will be contacted while planning the construction activities to minimise the cumulative impacts of the construction of the educational campus and Bayraklı IHC[31].

İzmir Katip Çelebi University is planned to provide support to Bayraklı IHC through the medical science departments of the University as declared by the local authorities who would be considered as a positive impact on the quality of healthcare services to be provided by Bayraklı IHC.

[31] (http://www.hurriyet.com.tr/ege/27682164.asp)

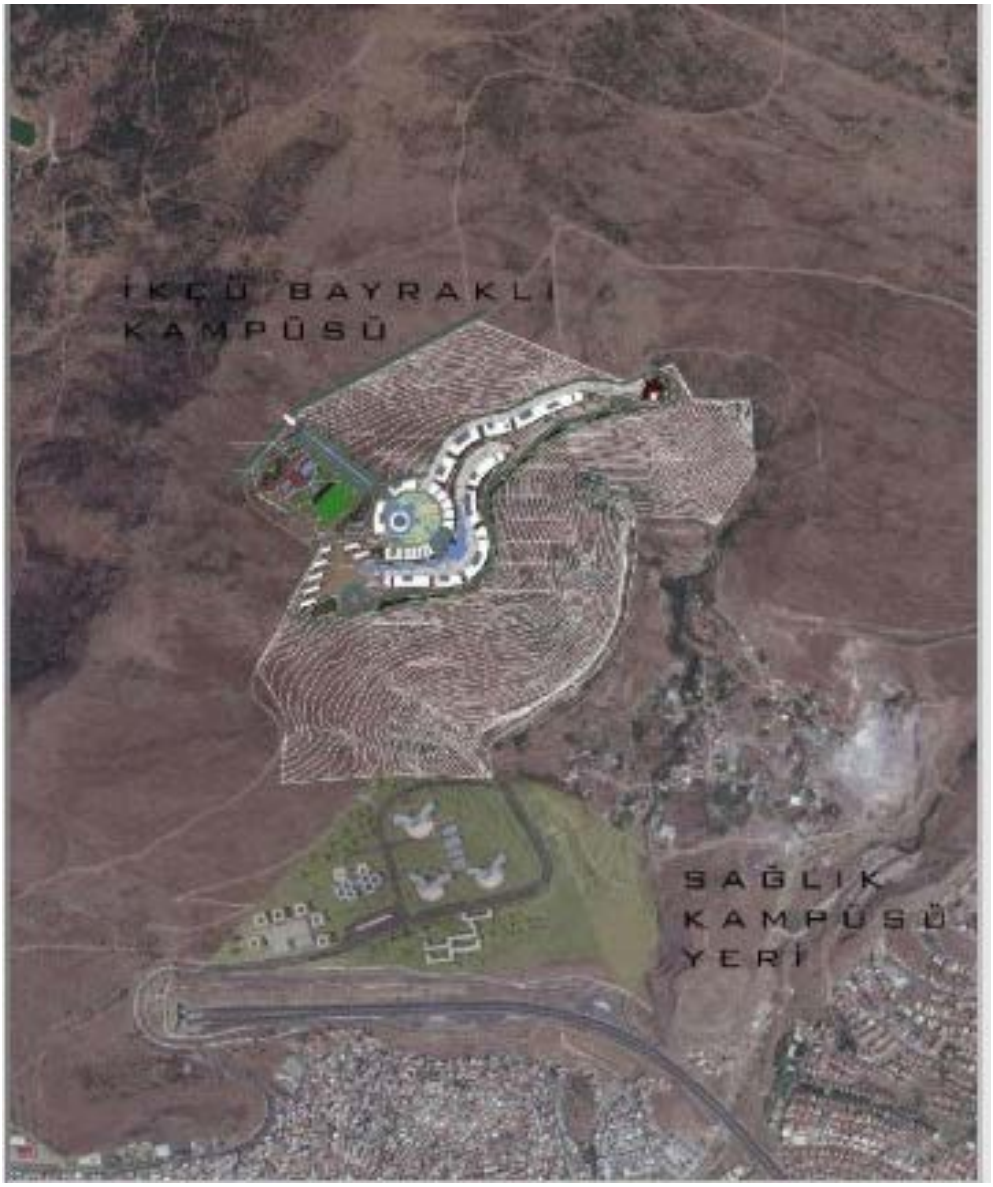


Figure 26: Location of Katip Çelebi University Campus in relation to the location of Bayraklı IHC

Influx of informal businesses

With the İzmir Bayraklı IHC in operation an influx of informal businesses such as food carts, flower shops, pharmacies, medical appliances shops. These would be considered as potential impacts of the project; providing new business and employment opportunities to the local population.

12.0 CONCLUSION

The ESA for the project has been conducted following a series of phases including:

- Scoping
- Stakeholder engagement
- Alternative analysis
- Baseline
- Impact assessment

- Definition of Environmental and Social Management System

The ESA complies with the relevant Turkish regulation and it is aligned with the 2012 IFC Performance Standards and Guidance Notes and EBRD Environmental and Social Policy, 2014 and guidelines. The various activities have been carried out by a working group including Turkish and International experts in environmental and social disciplines.

The general methodology for the impact assessment is based on the definition of Valued Environmental and Social Components (VECs), that are aspects of the physical, biological and social environment that are considered worthy of protection by the relevant legislation or by international standards.

The process of assessing impacts has been based on the following steps:

- The identification of Project Components, as individual elements that are characterized by similar features and construction, operation and decommissioning procedures;
- The identification of Impact Factors, or factors that can change the environmental and social quality of the VECs like air emissions, water discharge etc.,
- The definition of the sensitivity of the VECs to the Impact Factors identified, based on the environmental and social data collected during baseline;
- The definition of the Impacts as a result of the interaction between Impact Factors and Sensitivity of the VECs for each.

Each of the project components has been associated to one or more impact factor for each of the phases of construction, operation and decommissioning. Given the nature of the Project, most of the impact factors are going to be present only during the construction phase, while during the operation phase waste management, operation of forensic hospital are likely to generate some risks.

Impacts have been assessed considering the correct application of a set of standard mitigation measures that are drawn from good industry practice. Additional site or issue specific mitigation measures have been identified to address areas where high residual impacts are likely to occur, in order to ensure the impacts after additional mitigation measure are kept at an acceptable level.

As a result of the Environmental and Social Impact Assessment Study the following conclusion have been driven:

1) The project would benefit from the extension of existing transportation routes and public transportation alternatives to ensure access to Bayraklı IHC SPV will be in contact with local authorities to provide input on any future planning of the road and transportation in line with the developments in the area and maximize the benefit from future transportation network developments in the region.

2) The community health and safety concerns are valid especially in relation to f the Forensic Hospital. Continuous liaison is necessary with local community members to manage the associated risks.

3) Continuous stakeholder engagement is necessary manage the social risks of the project.

4)

5) The project will develop an Environmental and Social Management System in line with the minimum requirements that are defined as part of the ESA study.

The mitigation measures to be in place for the minimisation of environmental and social impacts of the project is detailed in appropriate sections of the report.

The requirements of an Environmental and Social Management System is also provided as part of the Environmental and Social Impact Study focusing on

- Environmental and Social Management System Structure

- Environmental and Social Management Plan
- Labour Issues and Health & Safety Management Plan
  - Labour Conditions
  - Occupational Health and Safety
  - Community Health And Safety
- Treatment of Patients
  - Dual Management
  - Patient Data Security
  - Forensic Hospital Services

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