Appendix 7-5-2

DRAFT

INITIAL ENVIRONMENTAL EXAMINATION (IEE)

FOR THE

GÖKÇEKAYA PUMPED STORAGE POWER PLANT PROJECT

January, 2011

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1 INTRODUCTION

1.1 Background

The Turkish government has shown a power development scenario in which the power consumption and the maximum power demand will annually increase by 8.4% on average by 2015. Given such a steep increase in the demand and the current generation capacity, construction plan, etc., it is projected that the country would become unable to cope with the peak demand by 2015. In line with such an increase in the power demand, the peak demand will also increase. Therefore, it is urgently required to carefully study an appropriate method for providing sufficient electricity during the peak hours in the future.

For the supply of electricity in the peak hours, pumped-storage power generation is considered as the most appropriate method since it is capable of raising the output in short time and allows the surplus electricity during off-peak hours to be utilized if a certain level of base power source is secured. Pumped-storage power generation requires advanced technologies not only in construction but also operation due to its particularity. However, the Turkish government has no experience in constructing or operating a pumped-storage power plant (PSPP). The Turkish government has a plan to proceed with PSPP development until around 2015, and has requested the Japanese government to provide support for their PSPP development since 2006.

In response to the request, the Japanese government through Japan International Cooperation Agency (JICA) dispatched the JICA Study Team to Turkey in 2010 in order to conduct "The Study on Optimal Power Generation for Peak Demand in Turkey". The JICA Study Team in cooperation with General Directorate of Electric Power Resources Survey and Development Administration (EIE) identified two candidate sites for PSPP development in Turkey. Gökçekaya PSPP Project is one of the candidate sites.

Though there is no obligation to conduct environmental assessment at conceptual design stage according to Turkish regulations, Initial Environment Examination (IEE) for the PSPP Project was carried out to minimize the environmental impacts by the Project from the initial stage as a step of environmental and social considerations.

1.2 Objective of the Study

The objectives of the study are to get initial information of the current situation of the project site, and to initially assess environmental impacts by the Project for effective and smooth implementation of Full-scale Environmental Impact Assessment (EIA) in the next step. This is expected to contribute to minimize environmental and social impacts by the Project.

1.3 Scope of the Study

The following tasks were carried out in this IEE Study:

- Review relevant policies, legislation, regulations and guidelines regarding environmental protection and conservation.
- Collect baseline data and information of the existing physical, biological and social environment around the project area through literature study, preliminary site investigation, and interviews with the villagers and related officers.
- Conduct initial assessment of anticipated environmental and social impacts by the Project.

- Prepare a draft of Terms of Reference (TOR) of Environmental Impact Assessment (EIA), which will be carried out during the feasibility study stage or pre-implementation stage.

It is noted that there will be limitation on accuracy of the potential impacts by the Project since current status of the Project is in pre-feasibility study. In this stage, exact quantity of potential impacts in detailed will not be discussed.

2 PROJECT DESCRIPTION

2.1 Objective and Need for the Project

The Turkish government has been forecasting that the power consumption in Turkey will annually increase by 8.4% on average by 2015. In line with the energy policy of Turkish Government, base-load power sources such as coal-thermal power plants and nuclear power plants will increase. Also, large capacity of renewable energy such as wind power will be developed. In consequence, not only peak-load power sources but also needs of ancillary services for frequency control of the power system will be required.

In order to meet the increase of peak power demand and ancillary service needs, it is expected to take urgent countermeasures.

In terms of power supply in peak hours, pumped-storage power generation is considered as the most appropriate method because it is capable to raise the output in short time and allows the surplus electricity during off-peak hours to be utilized if a certain level of base power source is secured. According to the study on optimal installation capacity of PSPP, 1,800MW of PSPP development by the year of 2030 is recommended to minimize the total generation cost in Turkey.

As for devices for ancillary services, pumped-storage power plant is also considered as the most economical and technically reliable method because of its characteristics.

In consideration of the power development scenario, Gökçekaya PSPP Project is expected to be developed as soon as possible as one of the most prospective peak power sources and ancillary services devices.

2.2 Scope of the Project

A PSPP is a power generation facility that utilizes water to generate and store electric power. A PSPP consists of two regulating reservoirs, which are connected by an underground waterway, together with an underground powerhouse located midway along the waterway.

Gökçekaya PSPP can generate electric power at the maximum output of 1,400MW for 7 hours with 428 m^3/s of designed discharge and 379.5 m of effective head.

For the PSPP Project, a full faced pond with 35 m of the maximum height of embankment will be constructed for the upper reservoir with 0.5 km^2 of reservoir area; totally 3.82 km of an underground waterway will be constructed; and 266,000 m^3 of a cavern for the underground powerhouse will be excavated at 365m-deep from the ground surface.

Since the existing Gökçekaya reservoir will be used as the lower reservoir, construction of a lower dam is not required.

For the construction of the structures mentioned above and also for the operation of the PSPP, 10km of access and maintenance road will be newly constructed, and 5 km of the existing road will be expanded. The associated transmission line is excluded from this study.

Profiles of the main structures/facilities for the PSPP Project are shown in Table 2.2-1.

As for the operation of the PSPP, the plant pumps up water from the lower reservoir to the upper reservoir during off-peak hours by using electric power generated by other power plants, and then uses the stored water to generate electricity when demand becomes high during peak hours. Therefore, once water has been stored in the reservoirs, it can be utilized repeatedly unlike ordinary hydropower plants, so PSPP can generate electricity every time at its installed capacity regardless rainy or dry seasons.

Table 2.2-1 Profiles of Main Structures of Gökçekaya PSPP Project

Description			Unit	Gökçekaya PSPP
General	Installed Capacity	P	MW	1,400
	Designed Discharge	Qd	m^3/s	428
	Effective Head	Hd	m	379.5
	Peak Duration Time		hrs	7
Upper Dam and Reservoir	Type			Full Face Pond (Asphalt)
	Height	H	m	35
	Crest Length	L	m	2700
	Dam (Bank) Volume	V	m^3	1,557,000
	Excavation Volume	Ve	m^3	10,310,000
	Reservoir Area	Ra	km^2	0.5
	Catchment Area	Ca	km^2	4.8
	H.W.L		m	800
	L.W.L		m	770
	Usable Water Depth		m	30
	Effective Reservoir Capacity		$mil.m^3$	10.8
Lower Dam and Reservoir	H.W.L		m	389
	L.W.L		m	377.5
	Usable Water Depth		m	11.5
	Effective Reservoir Capacity		$mil.m^3$	214
Waterway	Intake	L(m) x n	m	Bellmouse 34 x 1, Tunnel 396 x 1
	Headrace	L(m) x n	m	2,028 x 1
	Penstock	L(m) x n	m	662 x 2 , 110 x 4
	Tailbay	L(m) x n	m	125 x 4 , 116 x 2
	Tailrace	L(m) x n	m	476 x 1
	Tailrace	L(m) x n	m	Tunnel 53 x 1, Open 51 x 1
	Total Length	Lt	m	4,051
Powerhouse	Type			Egg-shape (Underground)
	Overburden		m	365.0
	Height		m	57.5
	Width		m	37.0
	Length		m	210.0
	Cavern Volume		m^3	266,000
Turbine	Type			Single-Stage Francis
	Number		unit	4
	Unit generating capacity		MW	350

2.3 Study Area

The Project site is located in Nallıhan District, Ankara Province as shown in Figure 2.3-1. The location of the existing Gökçekaya Dam/reservoir is on the Sakarya River, about 190 km west of Ankara, which will be utilized as the lower reservoir for the Project. The upper reservoir site is located in Kavak and Eğri Villages. It is on "Kisla River", which is a tributary of the Sakarya River.

General layout of the Project is shown in Figure 2.3-2.

Source: picsdigger.com/domain/allexperts.com/

Figure 2.3-1 Location of Project Site

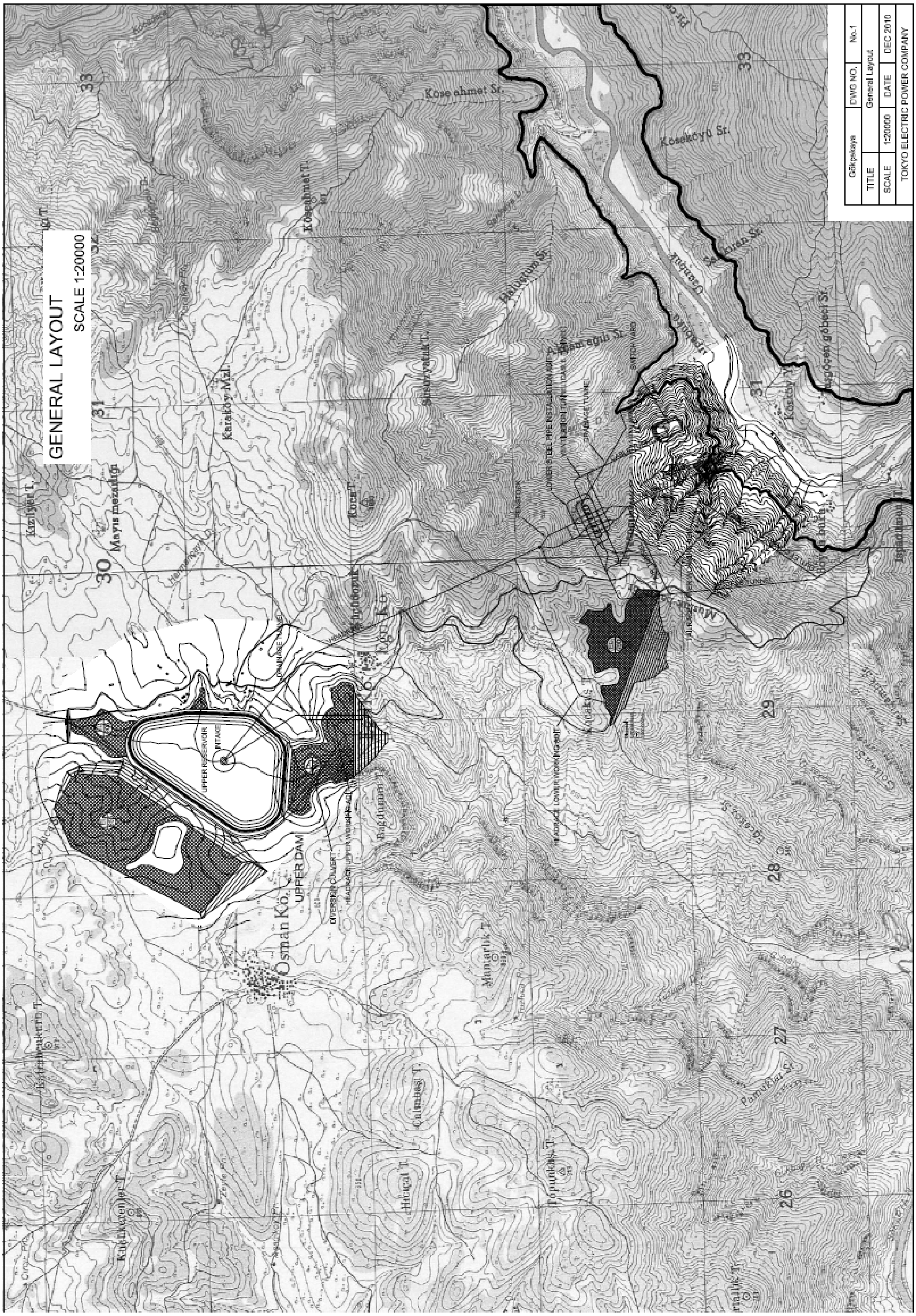


Figure 2.3-2 Layout of Gökçekaya PSPP Project

2.4 Project Activities, Timing/Sequence

The assumed implementation schedule is shown in Table 2.4-1. According to the schedule, it will take 13 years from start of Feasibility Study to Commencement of Operation.

Table 2.4-1 Implementation Schedule

Years from Start of FS	1	2	3	4	5	6	7	8	9	10	11	12	13
Feasibility Study													
EIA Procedure													
Fund Arrangement													
Procurement of Consultant													
Detailed Design & Tender Document													
Tendering													
Construction													
Operation													

The PSPP will be operated for at least 40 to 50 years. If the structures and facilities are well maintained and periodically upgraded, it will be operated more than that.

2.5 Quantity and Quality of Raw Material to be used

Rocks, sand and soils for construction materials are taken within the project area. Generation equipment and raw materials such as cement, asphalt, steel and others will be brought from outside of the Project area. Detailed quantity and specification of the materials will be identified during detailed design stage, however, harmful materials to the environment such as Polychlorinated Biphenyl (PCB) must be prohibited.

2.6 Quantity of Waste Products generated by the Project

From previous similar projects, one of wastes generated from the Project would mainly be from clearing vegetation. The local villagers living along the alignment could make use some of these wastes from vegetation e.g. for firewood, raw materials for charcoal production, fencing component as well as using in constructions of farm buildings and animal sheds. As part of the environmental protection procedures, and in order to protect surrounding forests and other natural resources, burning off is not permitted.

Another major waste materials anticipated from the Project is rocks and soils excavated from the Project areas. Some of these rocks and soils will be used for construction materials and/or back fill materials for the foundation; remaining will be left behind. The excavation and disposal materials balance is shown in Table 2.6-1.

The other wastes from the Project should be disposed and/or brought out from the Project site are on contractors' own responsibility.

Table 2.6-1 Excavation and Disposal Materials Balance

(m^3)

Excavation		Utilization		Required Disposal Volume
Rocks	Soils	Aggregates	Disposal	
8,881,166	3,301,884	1,450,145	10,732,905	13,705,313

2.7 Project Cost

The project cost was approximately estimated as shown in Table 2.7-1.

Table 2.7-1 Project Cost

Cost Items	Amount (million US$)
Preparatory Works	25.0
Construction Works	418.0
Equipment	377.7
Engineering Services	50.0
Administration Expenses	8.2
Land Compensation and Resettlemen	5.0
Contingency	88.4
Price Contingency	88.4
Custom & Duty	37.8
Total Project Cost	**1,098**
Unit Cost (US$/kW)	***785***

3 Policy, Legal, and Administrative Framework

3.1 Organization related to Environment

The main administrational organization for environment in Turkey is the Ministry of Environment and Forestry (MOEF).

In 1991, the Undersecretariat of Environment was merged with the Special Environmental Protection Institution, and thus the Ministry of Environment was established by the Decree in the Force of Law of 443. Further in 2003, the current MOEF was established merging two central bodies: the Ministry of Environment and the Ministry of Forestry. The organic Law of the MOEF (No. 4856) aims to set forth the principles regarding the establishment, organization and responsibilities of the MOEF to expect the followings:

- To protect and improve environment,
- To ensure effective use and protection of lands and natural resources in rural and urban areas,
- To protect flora and fauna, and to develop natural resources of the country,
- To prevent any environmental pollution,
- To harmonize protection and development of forests, and to expand forest area,
- To develop villagers living inside and nearby forests, and to take necessary measures, and
- To meet needs for development of forest products and forest industry.

MOEF has responsibility for International conventions such as Ramsar Convention, and for coordination with other related agencies for environmental conservation. And also, MOEF is responsible for management of all environmental protection areas.

The organizational chart of MOEF is shown in Figure 3.1-1.

The other agencies related to environment are the followings:

- Ministry of Agriculture and Rural Affairs,
- Ministry of Culture and Tourism,
- Ministry of Energy and Natural Resources.

During environmental study and/or Environmental Impact Assessment (EIA) related to land utilization, historical and cultural heritages, and mining resources, coordination with the agencies mentioned above is necessary.

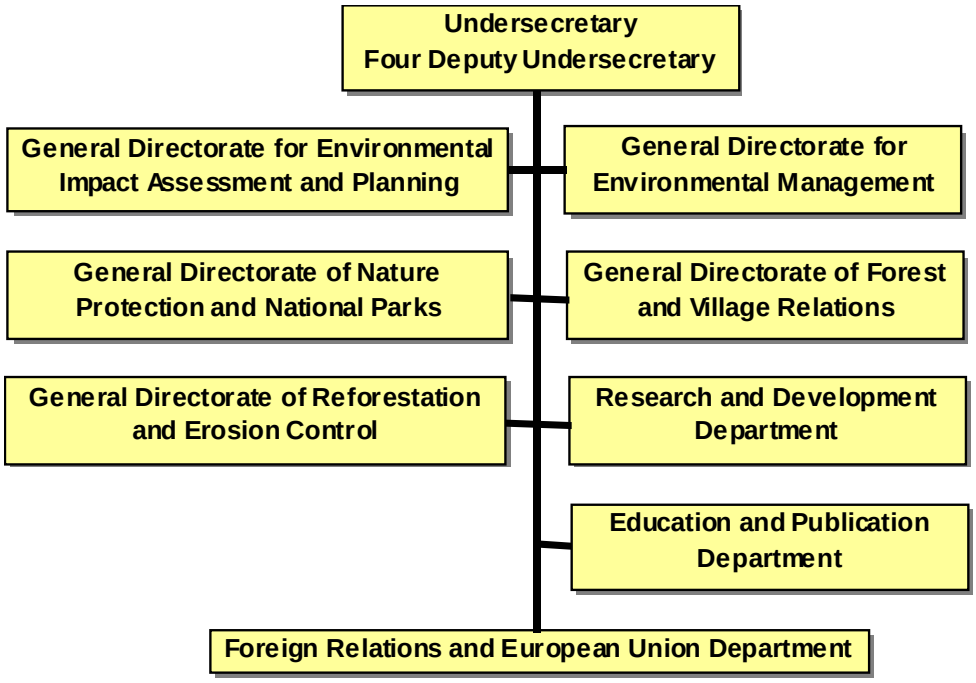


Figure 3.1-1 Organizational Chart of Ministry of Environment and Forestry

3.2 Environmental Legislation

(1) Laws and regulations in Turkey

The law, which governs environmental protection in Turkey, is the Environment Law No. 2872 which was enacted in 1983. The environmental Law shows a fundamental concept on environmental conservation. Since establishment of the Law in 1983, many regulations to support the Law have been established.

Currently effective laws and regulations related to development of pumped storage power plants (PSPP) are as follows:

Laws and Regulations	No.	Establishment
【Laws】		
Environmental Law	2872	Oct. 1983
Fishery Law	1380	Mar. 1971
Amendment of Fishery Law	3288	May. 1986
【Regulations】		
Regulation for Amendments to the Regulation Concerning Implementation of the Convention in International Trade of Endangered Wild Fauna and Flora Species	24623	Dec. 2001
Revised Regulation on Implementation of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (SITES)	25545	Jun. 2004
Forestation Regulation	25515	Jul. 2004
Regulation on Environment and Forestry Council	25622	Oct. 2004
Regulation on Preservation and Development Areas of Wildlife	25637	Nov. 2004
Regulation on Control of Water Pollution	25687	Dec. 2004

Protection of Living Spaces of Game and Wild Animals, Regulation on Harm Struggling Procedure and Fundamental Principles	25976	Oct. 2005
By-law on Environmental Impact Assessment	26939	Jul. 2008

(2) International Convention and Agreement

The government of Turkey has ratified many international agreements. The agreements related to development of PSPP are as follows:

Agreements	Ratification
UN Convention on Biodiversity (CBD)	1997
Convention on International Trade in Endangered Species of Wild Flora and Fauna	1996
International Convention for the Protection of Birds, Paris 1959	1966
Convention on Wetlands of International Importance	1994
Convention for the Protection of the World Cultural and Natural Heritage	1983

(3) Others

In addition to the environmental protection areas designated by Turkish government, Doga Dernegi（DD）has been carrying out designation of Key Biodiversity Areas (KBAs) to protect internationally important places for biodiversity with the support of the "Royal Society for the Protection of Birds." DD is one of NGOs in Turkey, who is a partner of "Birdlife International", "International Association for Conservation of Nature (IUCN)", and also "Alliance of Zero Extinction (AZE)".

Though MOEF is aware of the KBAs that should be fully considered, the KBAs have not designated as official protection areas so far. Since KBAs are places of international importance for biodiversity at the global level, it should be taken into consideration the possibility that those areas may be officially designated as protection areas in the future.

3.3 Environmental Impact Assessment (EIA) Regulation

(1) Legal Basis

Based on the Environmental Law No. 2872 of 1983, EIA Regulation or Bylaws (No. 21489) came into forth in February 1993. After amendment of the regulation three times, the currently effective By-law on Environmental Impact Assessment (No. 26939) was enacted in July 2008. MOEF has the responsibility for the EIA procedures.

(2) EIA Procedures

The flowchart of EIA Procedures is shown in Figure 3.3-1.

(3) Screening Criteria

Either "Full-scale EIA" or "Initial EIA" is required for project development in Turkey. Project owners are obliged to prepare an EIA report for each project.

Types of EIA depend on types, scale, and location of the projects.

a) Full-scale EIA

Types and scale of projects for which Full-scale EIA is required are defined in ANNEX I of the

bylaws. The criteria related to hydropower development are as follows:

- No. 15: Water storage facilities (dams and lakes with a reservoir volume of 10 million m3 and over).
- No. 16: River type power plants with an installed capacity of 25 MW or more.
- No. 32: Construction of overhead electrical power lines with a voltage of 154 kV or more and a length of more than 15 km (transmission line, transformer center, switch yards).

In addition to those criteria, projects, which are located in the environmentally sensitive areas listed in ANNEX V of the bylaws, are required to conduct Full-scale EIA.

b) Initial EIA

Types and scale of projects for which Initial EIA is required are defined in ANNEX II of the bylaws. The criteria related to hydropower development are as follows:

- No. 27 m): Water storage facilities (dams and lakes with a reservoir capacity of 5 million m3 or more),
- No. 28: River type power plants having 0.5 MW or more installed capacity,
- No. 32: 154 kV or more energy transmission facilities (5 kilometers or more).

(4) Disclosure of Information

Disclosure of EIA Information in Turkey is shown in Figure 5-1-4, and also as follows:

- Announcement to public and request for opinion when application of EIA is submitted,
- Public Participation Meeting for EIA Scope,
- Opening EIA report to public,
- Disclosure of results of EIA evaluation and those reasons.

Though officially required number of public participation meeting is only once, there are some cases that more than tree times of public participation meeting were held for hydropower projects. Therefore, it seems that disclosure of EIA information in Turkey is relatively at sufficient level.

EIA project list and recent EIA reports can be found at the following URLs respectively:

http://www2.cedgm.gov.tr/dosya/cedsonuckarar/cedsonuc.htm
http://www2.cedgm.gov.tr/dosya/cedilkbasvuru/cedbasvurudosyalari.htm

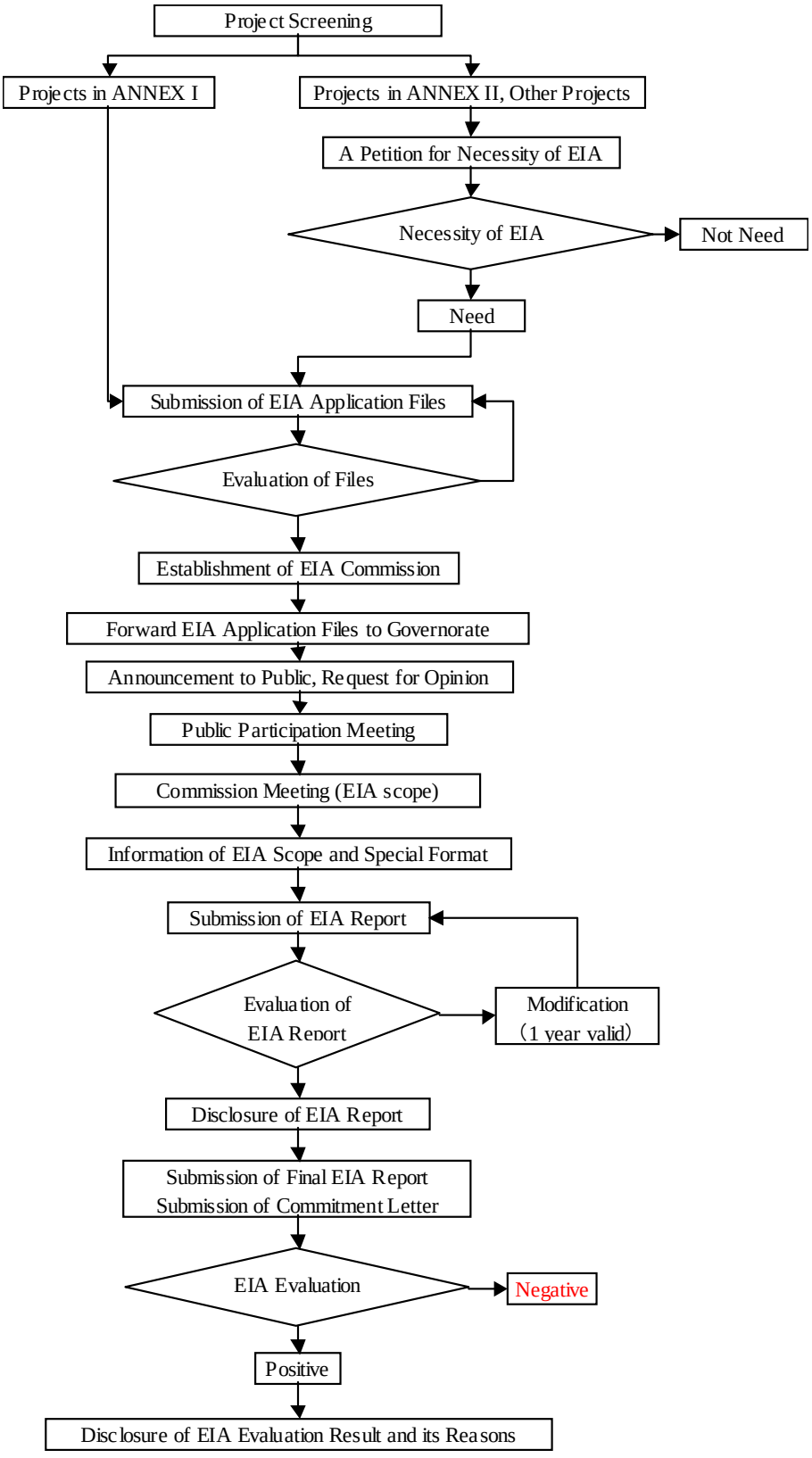


Figure 3.3-1 Flowchart of Environmental Impact Assessment Procedures

4 ENVIRONMENTAL BASELINE OF THE PROJECT AREA

4.1 Physical Resources

(1) Topography

The upper reservoir, lower reservoir, waterways and powerhouse of the Gökçekaya PSPP (Site 32-2) are all located in Kavak, Eğri Vıllageö, Nallıhan District, Ankara Provınce. The lower reservoir is the existing Gökçekaya Dam reservoir and located on the Sakarya River that is 824 km long and rising from Bayat Plateau Mountain which is located at the northeast of Afyon province in inner part of Aegean Region. The river joined by the Porsuk Çayı (Porsuk Creek) near the town of Polatlı, and then runs through the Adapazarı Ovası (Adapazarı Plains) before reaching the Black Sea.

Ankara is located at an intersection point of highways connecting east to west and north to south of Anatolia. It is spread out at the foot and along the slope of a mountain that rises to 3208 feet (978 meters) above sea level. The city is between 32° 52 ’E and 39° 56’ N as geographical position. The town is like a pot between four mountains of Anatolia Plateau with an altitude of 850-1000 meters. The mountains surrounding the city are: Karyağdı on the north, İdris on the east, Elmadağ on the south and southeast and Çal on the southwest. Between them, at a valley stretching on the southwest of the town three rivers run. Çubuk creek between Karyağdı and İdris mountains, Bent Stream between Elmadağ and İdris mountains and finally İncesu creek between Elmadağ and Çal mountains. And those combine between Karyağdı and Çal mountains and flow into the Sakarya River as Ankara stream. In this view, topography of Ankara and its vicinity can be divided into four as mountainous area, upland plateau, lowland plateau and lowland. The highest peak is 1,860m and composed of volcanic rock and sedimentary rock from Mesozoic period. The lowland is spread over an area of 2 km along the Ankara Stream at an altitude of 800-850 m.

(2) Soil and Geology

a) Soil Types

In general, brown soils are dominant in Ankara with a percentage of 55.16 %. The remaining is distributed into various types of red-brown soils, lime free brown forest soil, brown forest soil, alluviums, organic soils, colluvial soils and hydromorphic alluvial soils in very near portions to each other according to Ankara Province Land Potential Report prepared by Ministry of Agriculture.

Table 4.1-1 indicates the land use patterns of the soils of Ankara province.

Table 4.1-1 Land Use Patterns of the Soils of Ankara Province.

Land Use Distribution in Ankara Province-1	Area (hectares)	Share (%)
Land suitable for agriculture	1.276.870,85	49,5
Land not suitable for agriculture	1.297.729,15	50,5
TOTAL	2.570.600,00	100.00

Land Use Distribution in Ankara Province-2	Area (hectares)	Share (%)
Meadow and Pasture	394.937,00	30,5
Forest and Bushland	357.961,00	27,5
Land not suitable for plantation	544.837,15	142,0
TOTAL	1.297.729,15	100.00

Source: Ankara Governorship Province Agriculture Directorate

Soils of Nallihan District are subjected to severe erosion problem. Almost 88 % of the soils in the borders of the district are faced with erosion problem in mainly forest, meadow and pasture lands. Rocky areas are also persistent in the district and soils are not suitable for machinery use for plantation and harvesting due to steep slopes.

Table 4.1-2 indicates the land use patterns of the soils of Ankara province.

As for the soil type of the Project site, the upper reservoir, waterway, temporary facilities and roads are located in brown forest soil which has 20-50 cm depth, and subjected to water and wind erosion on a mild to steep slope. The waterway route, access tunnels and outlet structure are located on lime free forest soil with litosolic depth (very shallow), which is not suitable for any kind of agricultural activity due to steep slope and rocky structure. Such area is regarded as old damaged forest zone.

Table 4.1-2 Land Use Patterns Of The Soils Of Nallihan District

Land Use	Area (Hectares)
Grains	20.920
Vegetable	1.118
Fruit	422,3
Fallow	1.220
Vineyard	132
Irrigated Land	4.003,7
Feed grains	440
Safflower *(aspir-Carthamus tinctorius)*	120
Pasture-meadow	15.307
Greenhouse	21(existing) + 17 (in construction)
Total Cultivation Area	**43.683**

b) Geology

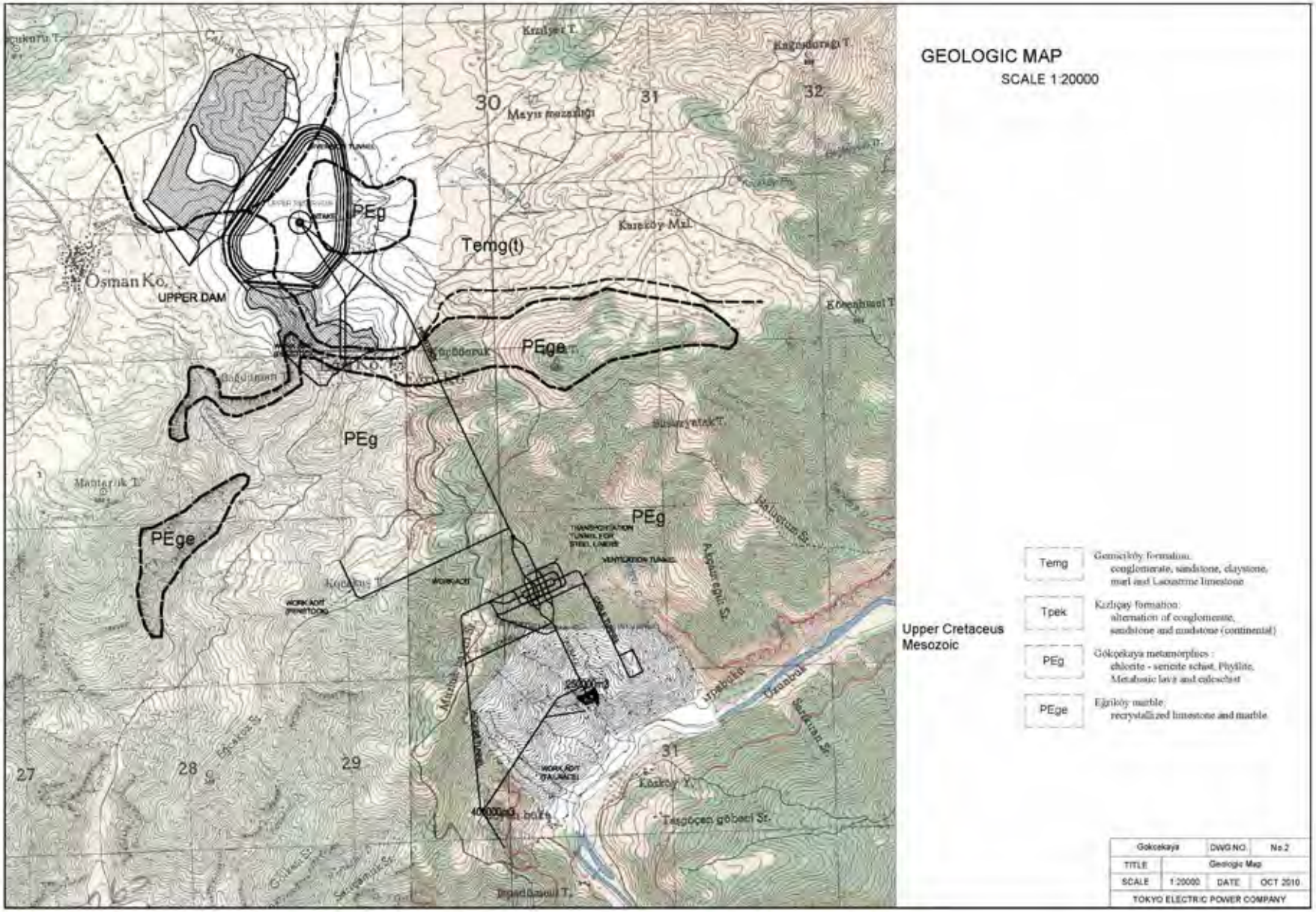
Bedrocks of this site are Gökçekaya formation −metamorphics-（PEg） and Kızlıçay formation (TPek), which distribute from south to north in old order. Geologic age of the former is upper Paleozoic to Triassic period of Mesozoic age, and the latter is which overlay the former with an unconformity state. Furthermore, Gemiciköy formation（Temg） of upper Eocene to lower Miocene age covers all the formers with unconformity state. Schematic geologic profile of this area is illustrated in Figure 4.1-1, which is transferred from the Adapazarı quadrangle.

Gökçekaya metamorphics（PEg）consists of chlorite － sericite schist, phyllite, metabasic lava and calcschist, and contains huge block of recrystallized limestone and marble which are the member of Eğriköy marble (PEge) at some places. Kızlıçay formation (TPek) is composed of an alternation of conglomerate, sandstone and mudstone (continental).

Gemiciköy formation（Temg）is made up of conglomerate, sandstone, claystone, marl and Lacustrine limestone.

The outlet is in the existing Gökçekaya Lake, because it is used for the lower dam of this scheme. The geology of the area is an ophiolitic mélange of Dağküplü formation (Of/Kg) in upper Cretaceous period of Mesozoic era. The horizon occurs under the PEg as thrust state. -above mentioned information were referred to the published geological map (1:100,000 Adapazarı H-25(2002) and H-26(2002).

Figure 4.1-1 Typical geologic profile of N-S direction shown in the Adapazarı quadrangle



i) The upper reservoir:

The upper dam site is located on a plateau in right bank of existing Gökçekaya lake.

There are PEg, TPek, and Temg in the dam site area. The previous site was planned on the steep cliff, and we recognized it a huge block of limestone. Although it was not clear, but there is a boundary of Temg and its lower horizon. It is N40E/20NW, and inclined gently to the reservoir direction.

Since the previous planned upper dam site was on the huge limestone block, we cancelled there and shifted to the wheat field in the upper reach of the reservoir, and the reservoir type was changed to asphalt faced dam, for fear the leakage from the reservoir. Tuff fragments are scattered on the surface of the left bank, and chlorite-biotite schist of PEg exposes at the foot of Kavak köy on the left bank.

ii) The lower reservoir:

The lower reservoir of this site is the existing Gökçekaya (arch) dam.

Since the right bank of the reservoir has steep slope and scare vegetation, good exposures of rock can be seen. General dip and strike of the strata is N70E/70～80NW.

Landslides are common on the lakeside, especially on the left bank. There are a few loose rock blocks on the right bank, and the outlet site is on one of the creeping rock masses.

iii) The waterway and the underground power house(UGPH)

The intake is designed as a morning glory type shaft on the bottom of the upper reservoir pond. The geology through the shaft is inferred Temg, and will change to TPek and PEge in due order to down, and most parts of the intake will be in PEg. The PEg observed on the outcrop shows less weathered massive rock, however, PEge which consists of limestone might have caverns at some places.

(3) Water Resources

Ankara and Eskisehir are not rich in terms of both surface and ground water resources since these two cities are located in inner Anatolia region. The main surface water of Ankara and Eskisehir is the Sakarya River. The Sakarya River is one of the main rivers in Turkey, situated in the west part of Turkey, and discharges to Black Sea. Its basin is 58.160 km² and covers the 7% area of the Turkey. Its length and width is about 810 km and 60-150 m respectively. It originates from Cifteler (close to city Eskisehir), and passes through Eskişehir, Ankara, Bilecik and Sakarya cities. Throughout its way to Black Sea, it has lots of branches, such as Porsuk, Ankara, Aladag, Nalderesi, Goynuk and Kirmir rivulents. It discharges to Black Sea at the town of Karasu (Sakarya). In addition, the Sakarya River and its branch Terme stream are important surface water resources of Ankara.

There are three dams/reservoirs on the Sakarya River related to the PSPP Project. As mentioned above, the existing Gökçekaya Dam will be utilized as the lower reservoir of the Project.

Gökçekaya Dam is located at 43 km north of Alpu town, 45 km east of Eskişehir Province in central Turkey, and 60 km downstream of Sarıyar Dam on the Sakarya River. Gökçekaya Dam was built to produce electrical energy in the territories of Eskisehir. The water comes to the Gökçekaya Lake from Sarıyar Dam Lake. Gökçekaya Dam is located in between Sarıyar Dam Lake and Yenice Dam Lake. The topographic structure of the area is mostly hilly, so the rain and snow waters run into the lakes from the surface in a short time.

Sarıyar Dam Lake is situated in the middle of Turkey, 180 km from Ankara center. Nallıhan Kuş Cenneti - Sarıyar reservoir is teeming with bird-life. The Nallihan Bird Sanctuary (NBP) including the adjacent reservoir of the Sariyar Dam is one of the most significant water resources and important bird areas of the Central Anatolia, where semi arid climate prevails. The reservoir has a surface area of 8,400 ha. The reservoir is lying in a long, narrow, and deep valley surrounded mainly by bare land, small villages and limited agricultural areas due to its topography and soil characteristics. The fishery established in the reservoir has a great importance for the local economy. The end part of the reservoir area is also used for agriculture from end of wet season. In addition, the reservoir is being used for irrigation of the nearby

agricultural areas. Since the dam was built on Sakarya River in 1958, it has been receiving various kinds of pollutants, including domestic and industrial effluents from the settlements located along the reservoir, as well as irrigation and surface runoff. Therefore, there has been continuous flow of pollutants into the river and the reservoir, and pollution in these water systems became significant during the last two decades.
Yenice Dam is located right down stream of Gökçekaya Dam, with 41 m of dam height and 58 million m3 of reservoir volume and 4 km^2 of reservoir surface area.
As for the upper reservoir of the Project, it is located on the Kisla Creek (River), which runs near the Kavak and Eğri Village. Local people do not demand on creeks for potable and irrigation water. Springs and grouwater are the main water source of the villages nearby.

(4) Climate
The climate of Ankara region is classified Mediterranean Climate. However Ankara has lower annual precipitation so that its climate can be classified under semiarid types of Mediterranean Climate. It is warm in summers, and cold and snowy in winters. The rainy season is in spring, especially in May. The wettest weather is in May when an average rainfall (precipitation) is 49 mm, and the number of rainy days is 12. The driest weather is in August when an average of rainfall (precipitation) is 9 mm, and the number of rainy days is 2. The average annual humidity is 60.3%, and average monthly humidity ranges from 41% in August to 79% in January & December.
As for the temperature, the highest recorded temperature is 41.4 °C in Sariyar Meteorology Station and the lowest recorded temperature is minus 32,2 °C in Esenboga Meteorology Station.
Since meteorological data at the Project site is not available, the one of Ankara is shown in Table 4.1-3.

Table 4.1-3 Meteorological Data of Ankara in 2006

Ankara Climate Data													
Month	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
Recorded high °C	11.1	17.7	27.2	27.7	31.1	38.8	37.2	42.2	33.3	30.0	21.1	17.2	42.2
Average high °C	1.6	4.4	10.0	15.5	20.0	24.4	27.7	28.3	24.4	18.3	10.5	4.4	16.1
Average low °C	-6.6	-5.0	-1.6	3.3	6.6	9.4	12.7	12.7	8.3	3.8	-1.1	-3.3	3.3
Recorded low °C	-31.1	-31.1	-27.2	-7.2	-6.1	0.5	3.8	3.8	-2.2	-8.8	-12.2	-17.2	-31.1
Precipitation mm	40	31	36	51	52	39	17	15	18	32	36	48	415
Avg. precipitation days	16	15	15	17	17	13	7	5	5	10	12	16	148
Avg. snowy days	13	10	6	1	0	0	0	0	0	0	3	9	42
Sunshine hours	81	112	174	192	267	312	353	338	282	205	132	74	2,521

Source: Historical Weather for Ankara, Turkey". Weatherbase.
http://www.weatherbase.com/weather/weatherall.php3?s=82171&refer=&units=us.
http://web.ogm.gov.tr/languages/English/dokumanlar/Publications/forestatlas.pdf

(5) Water Quality of Gökçekaya Reservoir

The water quality of Gökçekaya reservoir and other dame lakes along the Sarkaya River, which was measured in 2008, is shown in Table 4.1-4. Though propagation of algae is observed on the surface of the Gökçekaya reservoir, nutrient values such as nitrogen and phosphorus are relatively small. Therefore, the reservoir is regarded as a mesotrophic lake.

Table 4.1-4 Water Quality of Dam Lakes along the Sarkaya River (2008)

Lake	Sample point	Turbidity (NTU)	Hardness (FS^{o})	TSS (mg/l)	NH_4^+ (ppm)	NO_2 (ppm)	NO_3^- (ppm)	PO_4^{-2} (ppm)	COD (mg/l)
Gökçekaya	G1	0.54	38.57	2.39	0	0	3.01	0	19.23
	G2	0.52	38.36	2.08	0	0	2.44	0	15.86
	G3	0.40	37.15	3.59	0	0	5.36	0	20.36
	G4	0.91	37.68	73.38	0	0	6.71	0	22.00
	G5	4.54	37.71	12.63	0	0	4.79	0	31.43
Sarıyar	S1	1.06	35.95	3.46	0.49	0	3.91	0	21.7

Lake	Sample point	F^-	Cl^-	Br^{+2}	SO_4^{+2}	CO_3^{+2}	HCO_3^+	Na^+	K^+	Mg^{+2}	Ca^{+2}
Gökçekaya	G1	3.71	86.11	0.056	227.95	6.7	250.13	83.72	7.14	45.36	79.85
	G2	8.64	79.94	0.034	244.83	8.61	206.85	84.38	7.03	45.49	78.79
	G3	15.57	68.61	0.038	205.25	12.22	201.55	81.92	7.19	43.61	77.02
	G4	10.74	82.54	0.042	249.8	29.5	201.83	81.56	7.02	44.33	77.96
	G5	11.56	64.07	0.048	198.17	11.03	219.43	66.68	5.72	37.76	88.92
Sarıyar	S1	0.31	79.27	0.04	237.44	18.24	194.92	79.62	6.95	40.69	77.03
	S2	5.91	81.98	0.05	237.86	16.55	181.51	76.46	6.68	40.61	11.58
Yenice	Y1	13.97	73.74	0.02	235.49	30.05	186.35	87.05	7.65	45.8	80.87

4.2 Biological Resources

(1) General

Turkey has 9000 plant species of which 3000 is endemic. Most of these plants are located in forest areas. Deciduous forests are prevalent and relatively uninterrupted at moderate elevations along northern Turkey. Coniferous forests, depending on the species and locations, are found at varying altitudes from sea level to the timber line. Forest formations of the country include species belonging to different floristic regions, namely Irano-Turanion, Mediterranean and Euro-Siberian.

Approximately 800 woody taxa occur in the country's forests. The predominant species are Pinus brutia, Pinus nigra, Pinus silvestris, Abies spp. (A. cilicica, A. nordmannia, A. equi-trojani are unique.), Picea orientalis, Cedrus libani, Juniperus spp., Pinus, pinea, Cupressus sempervirens, Pinus halepensis, Fagus orientalis, Quercus spp., Alnus spp., Castanea sativa, Carpinus betulus.

The forests in Turkey are also home to most of 120 mammals, 454 birds and 93 reptiles found in the Country. However, Ankara and Eskisehir Province nearby the Project area are not rich in vegetation cover. Mountainous belt surrounding Ankara causes semi arid type climate thus two different types of vegetation cover are observed, namely steppe and forest. Main vegetation type covering the province land is steppe.

Regarding the vegetation cover, it is common that Atraphaxis billardieri, Salsola gradis and Tamarix parviflora observed at the edge of standing freshwater deciduous shrubland. In wet grassland, Lythrum salicaria (red sally), Crypsis schoenoides, Alopecurus myosuroides and Plantago major (large plantain) can be observed. In grassland, short shrubs like Salsola incenescens and Atraphaxis billardieri are found.

(2) Vegetation:

Total forest area of Ankara province is 368,236.4 ha. Common species in forests of Ankara are

as follows:

- Abies nordmanniana subsp. bornmuelleriana (Goknar)
- Pinus sylvestris. (Sarıcam)
- Pinus nigra (Karacam)
- Astragalus microcephalus (Geven)
- Quercus pubescens (Tuylumese)
- Quercus cerris (Saclımese)
- Crataegus orientalis (Alıc)
- Crataegus monogyna (Yemisen)
- Pyrus elaeagnifolia (Ahlat)
- Rosa canina (Yaban gulu)
- Juniperus oxycedrus (Ardıc)
- Berberis crataegina (Karamuk)

Table 4.2-1 Quality/Composition Distribution of Forest in Ankara Province

Quality/Composition	Area (hectares)
Forest	164.144,5
Degraded Forest	193.447,5
Without Forest Cover	2.384.576
Total Forest Area	357.592
Total Area	**2.742.168**

Source: General Directorate of Forest 2006

Table 4.2-2 Distribution of Forest Trees in Ankara Province

Tree Species	Area (hectares)
Pinus bruita	27.210
Pinus nigra	193.524
Pinus sylvestris	70.301,5
Abies	3.301,5
Oak	63.255
Total	**357.592**

Source: General Directorate of Forest 2006

In Nallihan District, 52.2 % of the forest is regarded as degraded forest (52,938 ha), and the remaining 47.8 % of the forest is only woodland (48,379.5 ha) Total forest area is 101,317.5 ha. Apart from forests, natural vegetation in Nallihan District is compatible with soils rich in gypsum. In this area, there are seasonal pools, marshy areas, high steppes and pastures and vegetation cover arises from mainly these features. The following list indicates the species absorbed in the route from Sariyar reservoir to Nallihan District.

Table 4.2-3 List of Species absorbed from Sariyar reservoir to Nallihan District

Area	Species
Along hills of Nallihan	Alyssum niveum Astragalus trichostigm Asyneuma linifolium Nallihanicum
In the vicinity of Sariyar Reservoir	Anabasis aphylla Muscari adilii Petrosimonia nigdeensis Salsola grandis Verbascum gypsicola

Source: MoEF Noah's Ark Biodiversity Data Base

(3) Biological Conditions around Project Site:

a) National Parks and other Environmental Protection Areas
The Project site is not located in any National parks and other environmentally protected areas. However, there are the following conservation areas in the vicinity of the Project area:

Nallihan Mountains Key Biodiversity Area (KBA) which has 82,667 ha of surface areais in the borders of Ankara and Bolu Provinces. The area is accepted as KBA due to presence of : Alyssum niveum, Asyneuma linifolium ssp. nallihanicum and Muscari adili.

(Ankara Provincial Environment and Forestry Department Report, 2008).

Source: Doga Dernegi, Turkiye'nin Onemli Doga Alanları, Ankara, 2006-Turkey's Key Biodiversity Areas

Figure 4.2-1 Nallihan Mountains Key Biodiversity Area (KBA)

Nallihan Bird Sanctuary is the important conservation area in the vicinity of the Project site. This Sanctuary including the adjacent reservoir of the Sariyar Dam is one of the most significant water resources and important bird areas of the Central Anatolia, where semi arid climate prevails. It is located at 180 km northwest of Ankara and has a surface area of 8,400 ha. The Sanctuary is also an internationally recognized bird area "Important Bird Area No: 45" (Yarar and Magnin, 1997). This area holds breeding population of night heron which breed in poplar plantation on the southern shores, while black storks, Egyptian vultures and lanners breed on the cliffs. The Sanctuary holds large number of roosting white storks and ruddy shelducks. Very large number of grey heron, egret, and little egret breeds in mixed the each other. Black kites and peregrine falcons also breed while white tailed eagle are frequently observed and suspected to breed in the sites close surroundings. The Sanctuary was declared as a Permanent Wildlife Reserve in 1994. Until today, about 250 bird species, most of them being water birds, have been observed in the Sanctuary according to "Perktas and Ayas, 2005".
The Nallihan Bird Sanctuary is determined to be an important area for passage migrants (26%) and summer visitors (24%). For passage migrants, 2 important non-passer bird species (Pelecanus onocrotalus and Platalea leucorodia), which have been declared strongly declined in Turkey (Tucker and Heath, 1994) can be observed. Moreover, previous observations in the area

showed that the teal (Anas crecca) and common crane (Grus grus) reached huge numbers as passage migrants. As for summer visitors, 5 important non-passerine bird species (Nycticorax nycticorax, Ardeola ralloides, Ciconia ciconia, Milvus migrans and Neophron percnopterus) that have been declared being declined in Turkey according ro "Tucker and Heath, 1994" can breed in the Sanctuary. Other species are Egyptian Vulture (Neophron percnopterus), Ciconia nigra, the grey heron (Ardea cinerea), ruddy shelduck (Tadorna ferruginea), black-headed gull (Larus ridibundus) Podicipedidae, Phalacrocoracidae, Ardeidae, and Anatidae.

Another important biodiversity area in the vicinity of the project site is **Sundiken Mountains Key Biodiversity Area** which is located in the borders of both Ankara and Eskisehir Provinces on the left bank hills of the Sakarya River. Alyssum niveum, Centaurea nivea, Sideritis gulendamiae are endemic and rare. In terms of fauna species, birds such as Aegyplusmonachus, Aquila heliacal, gypaetus barbatus, neophron percnopierus and butterfiey Plebeius hyacinthus are observed in the area.

Source: Doga Dernegi, Turkiye'nin Onemli Doga Alanları, Ankara, 2006-Turkey's Key Biodiversity Areas

Figure 4.2-2 Sundiken Mountains Key Biodiversity Area (KBA)

b) Vegetation

The upper reservoir area is agricultural land; most of the area is used for wheat fields, a and part of the area is used for vegetable gardens and mixed orchards for villagers' own consumption. The disposal area is near the forest zone consisting of degraded oak forest mixed with bushes partly. The tunnel route, outlet, access tunnels, and access roads are in a damaged forest or on the naked land or eroded land.

The land use map around the project site is shown in Figure 4.2-3.

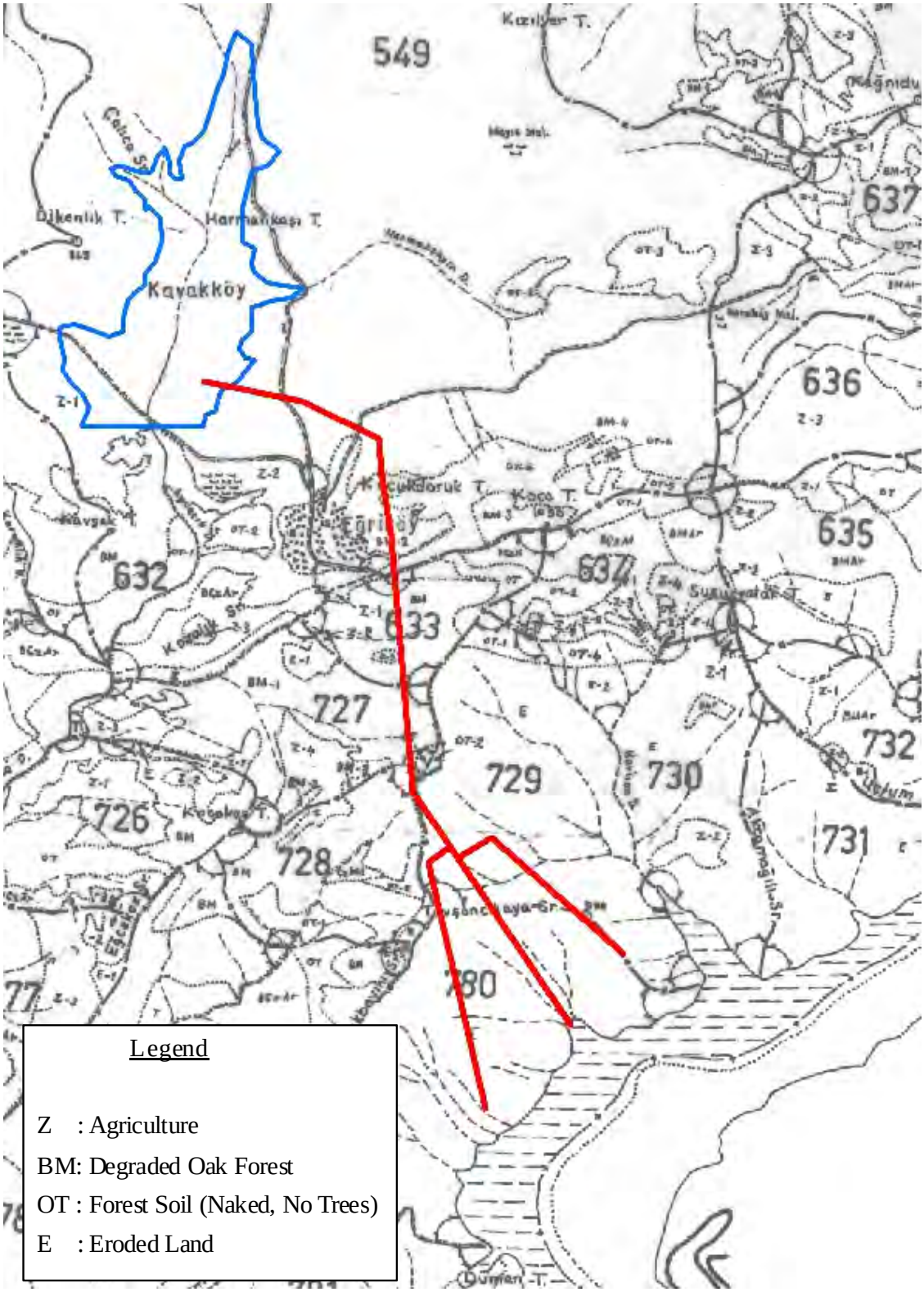


Figure 4.2-3 Land Use Map around the Project Site

c) Wildlife:
Wildlife in this area is foxes, wild pigs, wolves, and bears. Wild pigs is drastically increasing their numbers, and making damages to agricultural products in recent years. The villagers have requested the governmental office to protect their fields from wild pigs.

d) Fish Species in Lower Reservoir:
The native fish fauna in the Sarkaya River composed of 13 species including some endemics for Anatolia such as Capoeta baliki and Alburnus escherichii.

4.3 Socio-Economic Conditions

(1) Socio-Economic Statistics of Ankara Province and Nallıhan District

a) Population and Demographics
According to the results of the study done based on the recent address system in 2009, total population of Ankara Provice is 4,652,802. In Ankara Province, population in city and district centers is 4,513,921, and rural population is 136,881.
Population of Nallihan District is 30,970 in 2009, and population density is 16.11 persons/km². On the other hand, population of Beydili Subdistrict is 2,457. General Information of Economic Sector

b) Industry
Ankara was noted for having Turkey's most developed economy and best health and education infrastructure. It is principally a residential and governmental city. Ankara is an important market and processing center for mohair and for the fine fruits and wheat grown in the surrounding region. The city lies on the main east-west rail line across the Anatolia region of Turkey, and is a major crossroads for trade. Tourism is also increasingly important to the local economy.
The economy is fast growing with the industry, banking, transport and communication playing the lead roles. The diverse economy of Ankara largely is supplemented by its tourism as well as industrial sectors. Service sector plays a major role in providing jobs in Ankara. Its thriving banking sector, communication and transport also contribute to the economy of city in general.
Ankara contributes 19 % of the Turkish Gross National Product. 12 % of the total tax income and 12.3 % of budgetary income are collected in Ankara, however, share from national budget is limited to 6.4 %.
Machinery production companies for defense industry comprises 40 % of the total number of small to medium companies. Over the last 25 years since its establishment, the Undersecretariat for Defense Industry has made significant achievements in building blocks for a modern national defense industry in Turkey, with notable results in certain vital areas. As a result of considerable dedication and efforts, key defense industry institutions have been established to meet the requirements of the Turkish Armed Forces. Ankara is also the leader city of software, electronics and high technology. Ankara is the second largest city in terms of industry, and there are 3500 registered companies.
Tthe basic economical activities of Nallihan District is agriculture, animal breeding, trade and public services as well as mining and energy facilities in Cayirhan and Sariyar sub-districts. Total cultivated area is 436,830 dekars.
There are totally 8 cooperative production assemblies of which 2 is for irrigation, 2 for aquatic products and rest 4 is for agricultural development.

c) Employment and Unemployment Condition
Turkey's unemployment rate of the recent three months from August to October 2010 fell to

10.6 percent from 12.8 percent of the same period last year. As for the number of the unemployed people, the total number of jobless people became 2.78 million. Youth unemployment rate also decreased from 23.2 % to 19.5 in the same period. Those trend is reflected from the expansion of Turkey's gross domestic product by 11.7% and 10.3 % in the first and second in 2010 respectively.

d) Agriculture and Animal Husbandry

Agriculture has a significant place in economical activities in Ankara. In 927 residential units, 68,512 out of 85,069 individuals are engaged in agriculture and/or stock-breeding. 3,026 among 68,512 individuals deals with stock-breeding only.

6,554,775 dekars (1 dekar = 0.1 ha) out of 22,224,630 dekars of residential lands are used for agriculture. But only 5,934,299 dekars of lands have been irrigated.

5,990,967 dekars of lands are used for crop production; 3,487,000 dekars for wheat, 1,368,690 dekars for barley and 1,023,790 dekars for other products.

Various vegetables like tomato, melon, water melon, bean and cucumber are grown in 373,834 dekars of lands.

Though stock-breeding has a significant role in the economy, it seems to be receding. There are 303,000 cattle, 7-8,000 water buffaloes, 1,276,000 sheep and 345,117 Angora goats in Ankara.

Most of the populace of Nallıhan makes its living from farming and livestock breeding. Main income sources of the two counties are Angora goat breeding and the cultivation of silkworms.

Table 4.3-1 Animal Breeding in Nallihan District

ANIMAL HUSBANDRY	NUMBER
Cow	7983
Equidae	373
Sheep	22.820
Angora goat	10300
Kıl keçisi	14340
Poultry	631500
Beehive	2656

Source: Nalliihan District Agriculture Office-2010

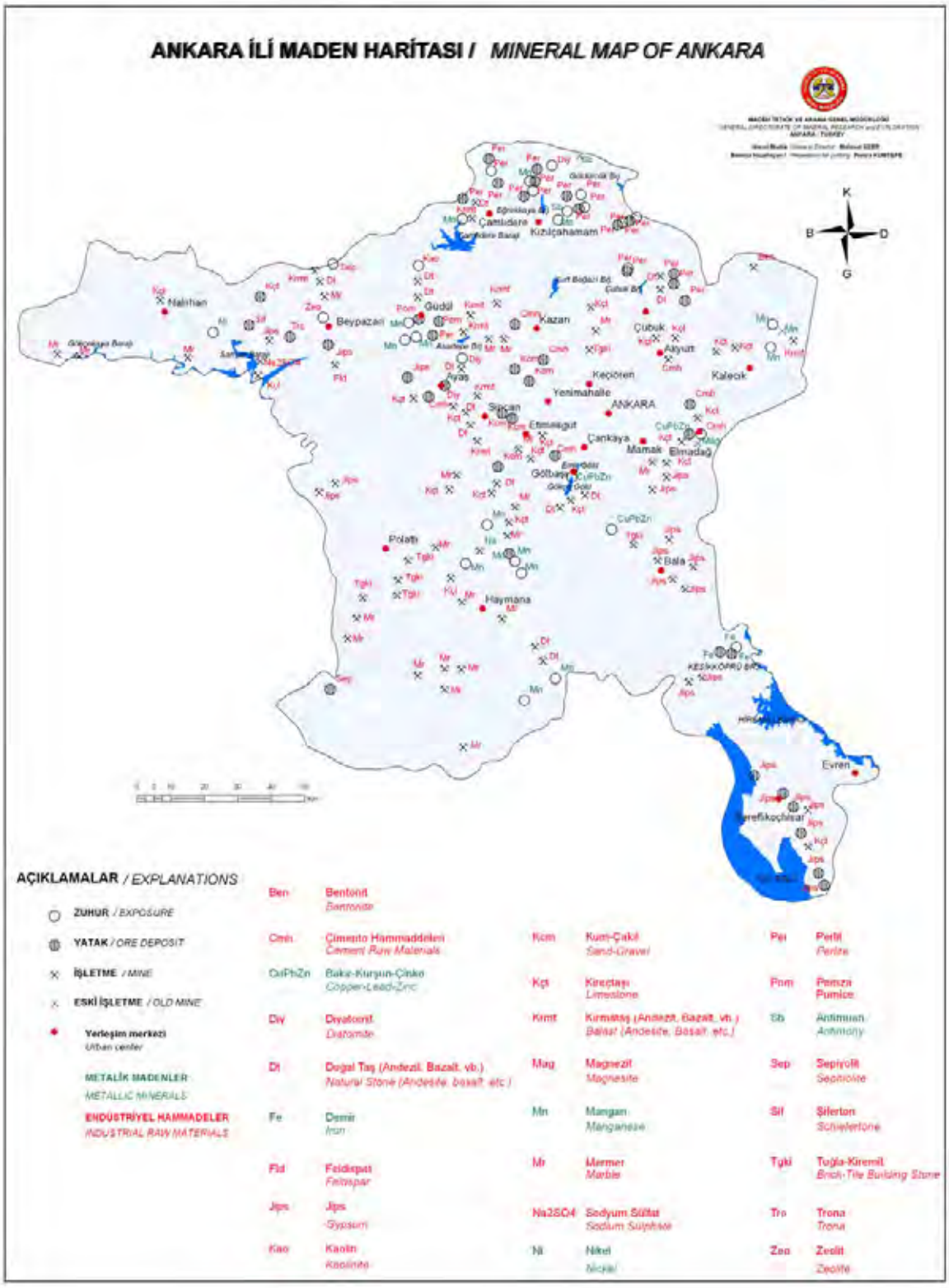
As for aquatic products, 120 tones/year carp, 30 tones/year capoeta tinca, 20 tones/year silurus glanis, 50 tones/year Atherina and 70 tones/year crawfish are caught in the Sariyar Dam reservoir.

In Gökçekaya dam reservoir, 950 tones/year and 29,950 tones/year capacity salmon breeding facilities are licensed and started production with the permission of Ankara Agriculture Directorate. There are other producers waiting for license for salmon breeding also.

Amateur fishing is also available in Gökçekaya reservoir for the species of Cyprinus carpio, Leuciscus cephalus, Abramis brama, Anguilla Anguilla.

e) Mining:

Ankara regarded as rich Province in terms of industrial raw materials and mines like trona, cement raw material, bentonite, gypsum, salt, limestone (Nallihan-Cayirhan), perlite, natrium sulphate and marble. The second important trona reserve of the world is in Beypazari District. Gypsum is important in Nallihan and Beypazari Districts having 150 million tones of reserve.



Source: General Directorate of Mineral, Research and Exprolation

Figure 4.3-1 Mineral Map of Ankara

(2) Social Conditions of Kavak and Egri Villages and Surrounding Area

(Upper Reservoir)

i) Population and Demography

There are totally 120 HH in Kavak Village, but the number of houses in which residents permanently live is only 80 out of 120 HH. The population of the village is 154 (Male: 67, Female:87). Most of the residents are old people who already retired from governmental offices. Most of young people go out of the village to look for jobs. Number of children is only 10.

As for Egri Village, there are totally 60HH in the village, but the number of houses in which residents permanently live is only 30 out of 60 HH. The population of the village is 83. Most of the residents are also old people who already retired from governmental offices as same as Kavak Village. There are no children in the village.

ii) Socio-economic Conditions

Most of the residents of the two villages rely on retirement salary. Aside from the salary, they can earn only from wheat harvest at the price of 200 TL/donum (0.1ha). Only one person (Head of Village) is engaged in cow breeding, and he can earn 30,000 – 35,000 TL/year.

iii) Public Facilities, Cultural Heritages, Tourist Resources

There is no school, and also no clinic in the both villages. Only public facilities are two mosques in each village.

There are no cultural heritages and no tourism resources in the villages. So, no impacts by the project are anticipated.

iv) Water Use

There are two pumping-up facilities in the reservoir site, but they are not operated currently. The residents currently get drinking water from deep wells. In Kavak Village, there is an existing well and a new one to be operated. In Egri Village, there are also two deep wells.

Very limited water flows on Kisla River through the year except during snowmelt season. The limited water is used for animal breeding. Since there are no water resources near the villages, irrigation facilities do not exist in the villages.

v) Development Plan and Needs

The residents of the villages have needs to expand the existing road, and they requested the government for the road expansion. However, they are questioning its realization.

They wish construction of a road reaching to the Gökçekaya reservoir for fish catching for their own consumption. If the road is constructed, they can access to the reservoir easily. They can shorten their travel distance from the current 30km to 7-8km in the future.

The other needs of the residents are irrigation facilities, health facilities, and any other income generation development.

(Lower Reservoir)

The lower dam/reservoir is planed to utilize the existing Gökçekaya Dam, which has 0.91 billion m3 of total storage capacity. There are no social activities around the outlet site. Although there are salmon breeding activities in the reservoir, no direct impacts to the activities by the project are anticipated.

4.4 Directly Affected Land and Expropriation Cost

According to the expropriation survey, which was carried out in October 2010, directly affected land is approximately 139 ha, of which agricultural lands are 110 ha, grave yard is 6 ha, and

forest is 23 ha.

Based on the survey result, expropriation cost was estimated as shown in Table 4.4-1. The total expropriation cost or land acquisition cost estimated is 7.51 million US$ in consideration of 20% increase for uncertainty. In consideration of expropriation cost for access roads, total environmental cost is estimated as 9.00 million US$.

As for the forest compensation cost, the forest regulation obliges the project owner to pay 0.5% of total project cost including costs for underground structures and facilities if the project is located in the forest. However, affected forest area in this Project is quite limited. Therefore, coordination with the forestry authorities should be done on the forest compensation cost.

Table 4.4-1 Expropriation Cost and Monitoring Cost

Items	**Area (ha)**	**Cost (million US$)**
Dry Agricultural Land KT2	90.60	2.02
Irrigable 3rd Class Agricultural Land ST3	7.41	
Mixed Fruit Garden	8.57	
Degraded Meadow	3.16	
Grave Yard	5.77	
Forest	23.00	
Other	(20% increased)	
Forest Compensation Cost (0.5% of Project Cost)	-	5.49
Sub-total		**7.51**
Expropriation Cost for Access Road and others	-	1.49
Total		**9.00**

5 ENVIRONMENTAL IMPACTS

At this moment, the development plan of the Project is in conceptual design stage so that specific design has not been developed. Also, the study team had a limited time during the site survey for this study. Nevertheless, the potential impacts on physical, biological and social aspects, which are related to design and construction, were identified using the checklist as shown in Table 5.1-1 based on the limited information and experience in similar PSPP projects in the past.

5.1 Environmental Impacts related to Design and Construction

Because of the following facts, it is expected that anticipated environmental and social impacts are limited:

- The land loss for the upper reservoir is relatively small in comparison with ordinary large scale hydropower projects,
- Since a bypass channel will be constructed, water flow will not be disturbed by the upper reservoir,
- Most of the waterway structures and the powerhouse are located underground,
- Construction of the lower reservoir is not required because the existing Gökçekaya Reservoir can be utilized for the lower reservoir,
- The Project site is accessible using the existing roads. New development of access roads for the Project will be limited,
- There is no information about existence of important species surrounding the project site.

However, the following direct impacts by the Project are anticipated:

i) Resettlement of three houses

The following three houses will be directly affected by the upper reservoir:

- A house which is the second house and owned by a resident of Kavak Village.
- A house which is the second house and owned by the person who is living outside of the Village. The owner stays in the house for limited days a year.
- Two storages for animal breeding.

ii) Relocation of Cemetery

Several ten graves of the cemetery of Kavak Village will be affected by the upper reservoir. So, compensation for the graves should be paid for those relocations.

According to the head of Village (Mr. Huseyin Eryucel), relocation of graves can be accepted by the local residents if relocation fee is paid to them.

iii) Relocation of Deep well for drinking water

Two deep wells in the upper reservoir site are important as a source of drinking water for the residents of Kavak Village. Therefore, deep wells should be newly drilled at out side of the reservoir.

iv) Loss of Agricultural Land

The agricultural lands of the upper reservoir site are owned by local residents of Kavak and Egri Villages. Since the lands will be submerged by the PSPP project, the loss of land itself as well as the loss of income from the wheat harvest and gardening should be compensated to the land owners.

In addition to the impacts mentioned above, careful attention to the villagers about noise and vibration during construction should be paid because Kavak Village is closed to the upper reservoir.

During construction, all the items concerned should be carefully considered and technical specifications must be given to contractors to conduct all necessary mitigation measures.

5.2 Environmental Impacts related to Operation and Maintenance

All the items in the check list should be carefully considered and necessary mitigation measures must be undertaken by operational organization to reduce impacts as much as possible.
Insect vector / waterborne diseases are at the moment not prevailing in the areas. The water levels of reservoirs of PSPP change everyday, which may not make insects (e.g. mosquito) actively breed. It is therefore likely that the diseases will not prevail. However, such insect vector / waterborne diseases should be monitored, and take necessary countermeasures in case.
Impacts on the natural environment should be carefully assessed and necessary countermeasures should be undertaken.

5.3 Environmental Impacts related to Project Closure

The operational lifetime of the Gökçekaya PSPP Project will be 40 to 50 yeas. If the structures and facilities are well maintained and periodically upgraded, it will be operated more than that. According to the experience of the existing hydropower plants, the power plant might be operated more than 100 years. Since it is difficult to forecast an appropriate de-commissioning process so far, the social and environmental consequences of closing and de-commissioning the Project in the far future cannot be described.

Therefore, it is recommended to set aside small amount from the Project' s revenue to bear the costs for mitigation measures and/or compensation on social and environmental issues during the project closure period. Issues and mitigation measures will be identified during 40 to 50 years' operation period and sufficient amount will be saved by the time.

Table 5.1-1 Checklist of Environmental Parameters: Gökçekaya (No.32-2)

	Anticipated negative impacts			**Remarks**
	Major	Unknown or can be mitigated	No significant impact	
A. Environmental Problems Due to Project Location				
A-1. Social Environment				
1. Effects on ethnic minorities			×	There are no minorities in the Project area.
2. Resettlement	×			The following three houses will be forced to resettle by the upper reservoir: ➢ A house which is the second house and owned by a resident in Kavak Village. ➢ A house which is the second house and owned by the person who is living outside of the Village. The owner stays in the house for limited days a year. ➢ Two storages for animal breeding. The existing Gökçekaya reservoir will be used as the lower reservoir for the Project. Therefore, there is no resettlement for the lower reservoir.
3. Loss of land (e.g. agricultural land)		×		The land at the upper reservoir area is mainly used for wheat field. Vegetable gardens and mixed orchards exist in the reservoir area. Such agricultural land will be lost. The waterway is an underground structure. So, limited forest land for adits, disposal yards and access road to the adits will be lost. Since the existing Gökçekaya reservoir will be used as the lower reservoir for the Project, land will not be lost for the lower reservoir.
4. Encroachment into watershed			×	The watershed is expected not to be affected.
5. Encroachment on historical and cultural	×			Several ten graves of the cemetery of Kavak Village will be

values				affected by the upper reservoir. So, compensation for the graves is required for those relocation.
6. Impairment of navigation			×	There is no shipping traffic along Kisla River. As for Gökçekaya reservoir, construction of outlet and operation of the PSPP will not disturb shipping traffic because of the wide reservoir area.
7. Inundation of mineral resources			×	There is no mineral resource in the Project site.
8. Decline of fisheries			×	Fishery is not practised in Kisla River. Salmon breeding is practiced in Gökçekaya reservoir, and small-scale fishery for local people's own consumption is practised in the area. However, construction of outlet and operation of the PSPP will not disturb fishery activities because of the wide reservoir area.
9. Downstream impacts			×	Discharge of Kisla River will not be affected by the upper reservoir because the river flow will be bypassed to the downstream. As for the lower reservoir, since Gökçekaya reservoir is utilized, there is no impact to the down stream.
A-2. Natural Environment				
1. Encroachment into precious ecosystem		×		The **terrestrial ecosystem** at upper dam / reservoir has already been degraded due to human activities. Some secondary forests are left, and they need to be conserved as much as possible. The **aquatic ecosystem** of both areas is not fully understood. However, the impacts can be limited because the water in the upper reservoir is pumped up. The river flow of Kisla River will be bypassed to the downstream.
2. Encroachment into existing protected areas			×	The Project site is not in any protected areas.
3. Migrating fish species			×	Since the river flow of Kisla River will be bypassed to the downstream, the upper dam/reservoir will not affect the migration of fishes. As for the lower reservoir, there is no impact because of utilization

				of the existing Gökçekaya reservoir.
4. Effects on scenic value			×	The current wheat filed will be converted to a lake with an embankment at the upper reservoir area, but it seems not to damage the scenic value of the area. As for the waterway route, impact on scenic value is limited because most of facilities are underground structures.
5. Downstream impacts			×	Impacts on the **terrestrial ecosystems** surrounding the Project site are limited and are expected small. The **aquatic ecosystem** of both areas is not fully understood. However, the impacts can be limited because the upper reservoir and the lower reservoir are in the same river basin.
A-3. Physical Environment				
1. Watershed erosion / silt runoff		×		There are no activities related to the Project in the watershed. Therefore, there is no risk of increase of watershed erosion and silt runoff by the Project. As for possibility of land slide caused by drawdown of reservoir water level, necessary protection is required if there are geologically weak slopes.
2. Effects on groundwater hydrology		×		Pumping up of groundwater is not necessary for operation of the PSPP. Therefore, impact on groundwater hydrology by the construction of waterway is not fully understood, but it is expected to be limited and small. Local people of Kaval and Egri Village are pumping-up underground water for drinking. Some deep wells will be submerged. Therefore, relocation of deep wells should be carried out.
3. Downstream water flow variations			×	Once the reservoirs are filled with water, the water flows from the dams are regulated to the same amount as before. It means that there will be no change in water flow variations.
4. Change of sedimentation transportation balance			×	Since the river flow of Kisla River will be bypassed to the downstream, the upper dam/reservoir will not affect the sedimentation transportation balance.

				As for the lower reservoir, there is no impact because of utilization of the existing Gökçekaya reservoir.
B. Environmental Problems Associated with Construction Stage		×		All the items in this section should be carefully considered and technical specifications must be given to contractors to conduct all necessary mitigation measures. Expansion of the approach road should be carefully planned in order to avoid villages and agricultural areas as much as possible and to prevent soil erosion and landslides as much as possible. Workers' camp is expected to be big and its social impacts are to be carefully assessed and fully mitigated. Careful consideration should be paid to select disposal area to prevent secondary impacts. Poaching and introduction of alien species must be well controlled to prevent disturbance to the local ecosystem and biodiversity (even if they are already degraded). Especially at the upper dam / reservoir site, the biodiversity of the surrounding forests should be protected.
B-1. Construction Monitoring				
1. Construction monitoring				
B-2. Construction				
1. Soil erosion / silt runoff				
2. Toxic wastes from equipment and cement factory				
3. Environmental degradation at quarry site				
B-3. Workers				
1. Safety of workers				
2. Sanitation at workers' camp				
3. Dust/ odors / fumes / noise / vibrations				
4. Quarrying hazards				
B-4. Social Environment				
1. Negative perception of local people				
2. Traffic accidents				
3. Traffic congestion and damage to road and bridge				
4. Environmental aesthetics				
B-5. Natural Environment				
1. Poaching by workers				
2. Firewood collection				
3. Introduction of alien species				
C. Environmental Problems Related to Project Operations		×		All the items in this section should be carefully considered and necessary mitigation measures must be undertaken by operation organization to reduce impacts as much as possible.
C-1. Operation Monitoring				

1. Operation monitoring				Insect vector / waterborne diseases are at the moment not prevailing in the areas. The water levels of reservoirs of PSPP change everyday, which may not make insects (e.g. mosquito) actively breed. It is therefore likely that the diseases will not prevail. However, such insect vector / waterborne diseases should be monitored, and take necessary countermeasures in case. Impacts on the natural environment should be carefully assessed and necessary countermeasures should be undertaken.
C-2. Operation				
1. Warning system				
2. Downstream erosion				
3. Eutrophication of the reservoir				
4. Downstream water quality				
5. Reservoir bank stability				
C-3. Social Environment				
1. Insect vector / waterborne diseases hazards				
2. Estuarine and marine fisheries impacts				
C-4. Natural Environment				
1. Poaching due to new access methods				
2. Illegal logging due to new access methods				
3. Encroachment due to new access methods				
D. Additional Consideration for Hydropower Projects		×		All the items in this section should be carefully considered and necessary mitigation measures must be undertaken. At the moment, it is unlikely that avian hazards from transmission lines and towers occur. This is because such avian hazards related to the transmission line from the existing Gökçekaya Hydropower Plant have not reported. At the moment, it is unlikely that aircraft hazards from transmission lines and towers occur. This is because there is not an airfield in the region.
D-1. Transmission Lines				
1. Encroachment on precious ecosystem				
2. Impairment of wildlife movement				
3. Avian hazards from transmission lines and towers				
4. Impairment of environmental aesthetics				
5. Soil erosion from construction and areas left exposed				
6. Inviting new encroachment				
7. Aircraft hazards from transmission lines and towers				
8. Induced effects from electromagnetic				

fields				

NOTE: The remarks are made based on the current plan. The assessments are based on the information obtained during the survey and should be reviewed and corrected, if necessary, at the next stage.

6 MITIGATION MEASURES AND ALTERNATIVES

6.1 Examination of Alternatives

(1) No construction of the PSPP Project

In case that the PSPP Project is not constructed, Gas-Turbine Power Plants (GT) are installed as an alternative power source for peak load.

PSPP has technical advantages in comparison with GT such as faster responsibility to the fluctuation of power demand etc.

Aside from the technical advantages, initial unit construction cost per kW of PSPP is lower than the one of GT. Though operation unit cost is higher than the one of GT, PSPP is more economical than GT as a peak load power source.

As for environmental aspects, the result of simulation shows that about 70,000 ton-CO2/year of CO2 emission can be reduced by installation of the PSPP because consumption of gas can be reduced.

Thus, implementation of the Project is recommended from viewpoint of technical, economical and environmental aspects.

(2) Alternative PSPP Project Sites

During the Master Plan Study, at first 58 potential sites were identified in the country. Ten out of 58 sites were selected as priority sites for preliminary site survey by the desk study from viewpoints of economic, geological and environmental aspects as shown in Figure 6.1-1. Based on the results of the preliminary site survey, Gökçekaya PSPP Site (No. 32-2) was selected one of the most economical and environmentally friendly sites.

Figure 6.1-2 Selected Site for Preliminary Site Survey

Table 6.1-1 Evaluation Result of PSPP Potential Sites

Project Site No.	11-1	11-2	19	21-1	24	26	27-1	31	32-2	37-1
Economic Value (US$/kW)	744	780	734	778	767	758	727	—	732	729
Scores of Environmental Evaluation	1.00	1.19	1.19	1.19	1.19	1.00	1.00	1.19	1.19	2.00
Priority Rank	A	B	AA	B	B	A	AA	C	AA	B

Priority Rank

AA : It is economically **superior** and there is **no significant** natural / social environmental impacts **nor** technical problem

A : It is economical, and there are **no significant** natural / social environmental impacts **nor** technical problems expecte

B : It is economically feasible and there are natural / social environmental impacts or technical problems expected

C : It is **uneconomical** or there are **significant** natural / social environmental impacts or technical problems expected.

6.2 Mitigation Measures

Mitigation measures against anticipated impacts should be determined based on results of sufficient evaluation of environmental and social impacts. Therefore, those will be proposed during full-scale EIA process.

For reference, typical environmental mitigation measures applied to the previous PSPP projects are shown in Annex 1.

7 DRAFT TOR FOR ENVIRONMENTAL IMPACT ASSESSMENT

According to the currently effective By-law on Environmental Impact Assessment (No. 26939) was enacted in July 2008, types and scale of projects for which Full-scale EIA is required are defined in its ANNEX I. The criteria related to hydropower development are shown as follows:

- No. 15: Water storage facilities (dams and lakes with a reservoir volume of 10 million m3 and over).
- No. 16: River type power plants with an installed capacity of 25 MW or more.
- No. 32: Construction of overhead electrical power lines with a voltage of 154 kV or more and a length of more than 15 km (transmission line, transformer center, switch areas).

According to the screening criteria of JICA and World Bank, PSPP projects are generally categorized as “Category A”, for which careful EIA procedures are required.

During full-scale EIA procedures, sufficient site investigation should be carried out to fully know the current environmental situation, and consultation with Project Affected People (PAPs) and other related persons should be done to reflect PAPs’ opinion to the Resettlement Action Plan (RAP) and Environmental Management Plan (EMP)..

In order to implement EIA procedures, environmental consultants or experts who are familiar with PSPP development will be hired. The draft of Terms of Reference (TOR) for consultant procurement is prepared as shown in Annex 2.

8 DESCRIPTION OF PUBLIC INVOLVEMENT

8.1 Activities for Public Involvement

Basically, disclosure process and consultation with local stakeholders at the stage of Master Plan Study are not required according to Turkish regulations. Actually, it is difficult to disclose information of the Project and make consultation with local stakeholders at the stage of Master Plan Study because the project profile and even project owner is still uncertain. There is a possibility for local stake holders to have too much expectation and/or misunderstandings with such uncertain information.

In the course of the study on environmental and social considerations for the Project, however, the following process was taken to have common understanding on the Study in consideration of the concerns mentioned above:

a) The 1st Workshop

During the 1st workshop on May 13, 14, 17, 2010 in Ankara, the concept and characteristics of PSPP was explained to the participants including officials from MoEF, EIE and other Turkish stakeholders. And also, methodology of the Study for environmental and social considerations was explained to them, and asked for their comments.

b) Brief Explanation about the Project during preliminary site survey

During the first visit to the project site for the preliminary site survey on May 31 and June 1, 2010, the survey team contacted local residents of Kavak and Egri Village and explained purpose of the visit and possibility of a PSPP project in the area. There was no objection against the Project.

c) The 2nd Workshop

During the 2nd workshop on August 26, 2010 in Ankara, results of the preliminary site survey and the next step for environmental and social considerations including methodology of the IEE Survey to the participants from related agencies.

d) Consultation with related Villages and Nallihan District Office during IEE survey

During the IEE level site survey on September 2-3, 2010, explanation of outline of a PSPP and consultation was made with the head of Kavak, Egri and Osman Villages and other villagers. The survey team together with Village heads and other villagers visited the Project site to confirm the range of area to be affected conducted as shown in Annex 4.

8.2 Willingness to accept the project

Most of villagers in Kavak and Egri Village are old people. Young people go to urban areas because there is no job in the village.In this connection, villagers represented by the village heads are expecting to realize the PSPP Project to have job opportunities during and after the construction of the Project.

Related to the Project, they expressed their needs of construction of a road reaching to the Gökçekaya reservoir for fish catching for their own consumption under the social responsibility project. And also, they requires watering facilities for animal breeding as their another need.

9 CONCLUSION AND RECOMMENDATIONS

The main impacts by the Gökçekaya PSPP Project are resettlement of three houses and graves of Kavak Village. However, crucial environmental and social issues on the Project were not found at this moment. In addition, the followings are relatively friendly to the environment.

1) There in no national parks and other environmental protected areas around the project sites, and there is no information of endangered species in the project sites,
2) New construction of the lower dams is not required because the existing reservoirs can be utilized as lower reservoirs,
3) The scale of the upper reservoirs is relatively small in comparison with dams for ordinary large-scale hydropower projects,
4) Most of the waterways and the powerhouse are underground structures,
5) There are existing roads which can be used for access roads to most of the construction sites. Only expansion of the existing roads are needed,
6) Once the upper reservoirs are impounded, it is not necessary to take additional water for those operations.

Therefore, it is expected at this moment that environmental and social impacts by the Project will be limited. Further, the villagers are expecting to have job opportunities during the construction, and also to realize construction of access road to the Gökçekaya reservoir for fishing under one of Corporate Social Responsibility (CSR) activities related to the project. Therefore, the villagers are expecting realization of the project.

Even if anticipated environmental and social impacts by the project are limited at this moment, however, careful and detailed EIA procedures should be carried out through sufficient site investigation and consultation with Project Affected People (PAPs) and other related persons.

ANNEXES

1. **Typical Environmental Mitigation Measures for PSPP Projects**
2. **Draft of Terms of Reference (TOR) for Environmental Impact Assessment (EIA)**
3. **Pictures during Site Survey**

ANNEX - 1

Typical Environmental Mitigation Measures for PSPP Projects

Typical Environmental Mitigation Measures for PSPP Projects

Items		Factors	Mitigation Measures	Category		
				Avoidance	Reduction	Compensation
Air Pollution	Dust	Operation of Heavy Equipment	No operation of heavy equipment simultaneously and at high load	X		
			No operation when wind is strong	X		
			Distribution of access route to the construction site	X		
			Water sprinkling		X	
			Installation of temporary enclosure fence		X	
			Isolation of equipment from objects to be protected		X	
			Temporary pavement		X	
			Washing construction vehicles		X	
Noise	Noise	Transportation of construction materials	Distribution of approach routes	X	X	
			Installation of sound insulation walls		X	
			Improvement of construction method and working time		X	
		Operation of Heavy Equipment	Avoidance of transportation during night time	X	X	
			Employment of low-noise construction equipment		X	
			Improvement of construction method with low-noise		X	
			Isolation of equipment from objects to be protected		X	
			Improvement of construction method and working time		X	
			Driving speed control and restriction of overload transportation		X	
Vibration	Vibration	Transportation of construction materials	Distribution of access route to the construction site	X	X	
			Improvement of construction method and working time		X	
		Operation of Heavy Equipment	Avoidance of transportation during night time	X	X	
			Employment of low-vibration construction equipment		X	
			Improvement of construction method with low-vibration		X	
			Isolation of equipment from objects to be protected		X	
			Improvement of construction method and working time		X	
			Driving speed control and restriction of overload transportation		X	
Water Pollution	Water Quality	Existence of Reservoir	Employment of Selectable Outlet Facility		X	
			Installation of bypass channel		X	
			Installation of aerator		X	

	Turbidity	Temporary Construction	Installation of drainage canals	X		
			Installation of settling basin		X	
			Employment of turbid water treatment facility		X	
Topography Geology	Important topography and Geology	Transformation of land	Change of location	X		
			Minimization of scale of structures and change to underground structures	X	X	
			Minimization of transformation of land		X	
		Existence of Reservoir	Change of location	X		
Fauna	Important Species & Habitat	Existence of Structures and Plant Operation	Change of location	X		
			Restriction of lighting in night time	X		
			Prohibition of entering to outside of construction areas	X		
			Prohibition of capture of animals and intimidation	X		
			Minimization of scale of structures and change to underground structures	X	X	
			Change of road design to tunnels and bridges	X	X	
			Minimization of transformation of land		X	
			Appropriate disposal of garbage		X	
			Creation slopes, which small animals can climb		X	X
			Restoration of vegetation of construction areas			X
			Creation of swamp and marshy place			X
			Transplantations of precious species			X
Flora	Important Species and community	Existence of Structures and Plant Operation	Change of location			
			Prohibition of entering to outside of construction areas	X		
			Erosion measures during rain	X		
			Prohibition of extraction of plants	X		
			Protection of precious species	X		
			Prohibition of entering into swamp and marshy place	X		
			Minimization of scale of structures and change to underground structures	X	X	
			Change of road design to tunnels and bridges	X	X	
			Minimization of transformation of land		X	
			Creation of swamp and marshy place			X
			Transplantations of precious species			X
			Seeding or reforestation of transformed land			X
Ecosystem	Typical	Existence of	The same as the measures for fauna and flora	X	X	X

	Ecosystem	Structures and Plant Operation				
Scenery	Important scenery resources	Existence of Structures and Plant Operation	Change of location	X		
			Minimization of scale of structures and change to underground structures	X	X	
			Minimization of transformation of land		X	
Waste	Waste	Temporary Construction	Recycling		X	

ANNEX - 2

Draft of Terms of Reference (TOR) for Environmental Impact Assessment (EIA)

Draft Terms of Reference of Environmental Impact Assessment
for *(Name of Project)* Pumped Storage Power Plant Project

1 Introduction

(General information of the Project shall be briefly explained)

2 Background Information

(Background of the Project and this Study shall be briefly described.)

3 Objectives

The objectives of the study are:

- Conduct surveys and analysis of current environmental baseline of the Project site and surrounding areas,
- Identify social and environmental impacts owing to the Project,
- Propose impact mitigation measures, monitoring plan and resettlement plan,
- Prepare Environmental Impact Assessment (EIA) Report supported by all social and environmental reports required for development of the *(Name of Project)* Pumped Storage Power Plant Project, such as, Environmental Management Plan (EMP), Resettlement Action Plan (RAP), and others.

4 Environmental Assessment Requirements

Measures for assessment, management and monitoring of social and natural environmental impacts have been developed based on Turkish legislation, regulations, decrees, standards and guidelines.

(In case that a funding source is an international donor agency, EIA procedures should be compliance with the Operational directives, standards and guidelines of the agency. Its requirement should be described here.)

5 Study Area

The study area in this study covers all areas affected by the Project whose components are a dam, reservoir, waterway, powerhouse, tailrace, transmission line and surrounding areas. It also includes access roads from main provincial roads to the site, and construction yards such as base camps, stockyards and other temporary construction yards.

6 Scope of Work

6.1 Task 1 Description of Project Information

The Consultant shall provide the following information:

- Scope of the Project
  - Location of all project-related development sites and Right of Ways (ROWs) such as dam area and surroundings, including appurtenant structures as powerhouse, waterways, switchyards, reservoir area, area upstream of the impounding reservoir, downstream area, resettlement area, transmission line, access roads, area for compensatory and mitigation measures, quarry and disposal site, workers camps construction and installation sites etc. using topographic maps and land use maps with appropriate scales..
  - General layout of facilities at project-related development sites
  - Design basis and profile of the structures
- Project Activities
  - Pre-construction and construction activities
  - Operation and maintenance activities
  - Schedule of the project

- Quality and quantity of raw materials
- Quality and quantity of construction equipment
- Quality and quantity of waste products generated by the Project
- Project cost

6.2 Task 2 Study on Legislative and Regulatory Considerations

The Consultant shall provide the pertinent regulations and standards governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, siting, land use control, etc., at international, national, regional and local levels. The Consultant shall also provide the relevant administrative requirements and set-up.

6.3 Task 3 Study on Baseline on Environment of Project Area

Based on base on site investigation, consultation with stakeholders and literature study, the Consultant shall assemble, evaluate and present baseline data on the environmental characteristics of the study area. It will include information on any changes anticipated before the project commences. As for data which seasonal changes are anticipated, site investigation shall be carried out seasonally.

The following items shall be described:

a) Methodology of data collection, analysis and evaluation
b) Physical Resources
   Topography, Geology and Soils, Climate, Natural Disaster Situation, Hydrology, Water Quality, Air (Atmospheric Conditions), Landscape Characteristics
c) Biological resources
   Flora (Vegetation), Fauna (Wildlife, Aquatic Animals), National Parks, Natural Parks, Provincial and District Protected Areas, and other Environmental protected Areas, Sensitivity Level (in line with the Sensitive Locations List in Annex V of Gazette No. 26939 “By-Law On Environmental Impact Assessment (EIA)”) of the environment which may become polluted due to proposed project activities
d) Socio-economical Condition
   Population and Demographics, Agricultural Production and Livelihood Systems, Commercial and Industrial Activities, Archeological and Architectural Heritage, Health and Educational Conditions, Infrastructure and Facilities, Energy Consumption, Ethnic Conditions, Land-usage and Ownership Status, and so on.

6.4 Task 4 Analysis of Potential Impacts by the Project

The Consultant shall identify all significant potential impacts, which the project would incur, in consideration of characteristics of pumped storage power plants. These would include, but not be limited to, changes in Physical Resources, Biological Resources, Socio-economical Conditions as described above under Task 3, including impacts due to accidental events, impacts which are unavoidable or irreversible.

In this analysis, the Consultant shall distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. The Consultant shall also try to describe impacts quantitatively in terms of environmental costs and benefits when feasible.

6.5 Task 5 Analysis of Alternatives

The environmental assessment should include an analysis of reasonable alternatives to meet the ultimate project objective. This analysis may suggest designs that are more sound from an environmental, socio-cultural or economic point of view than the originally proposed project. The “no action” alternative – not constructing the Project- in order to demonstrate environmental considerations without it will be included. Alternatives should include the

following: the "no action" alternative; alternative means of meeting the energy requirements; the alternative of upgrading existing facilities; alternative routes and sites; alternative design; and alternative methods of construction, including costs and reliability.

6.6 Task 6 Proposal of Mitigation Measures

For the proposed project, the Consultant shall recommend feasible and cost-effective measures to prevent or reduce significant negative impacts to acceptable levels, which will include measures to address emergency response requirements for accidental events. When selecting mitigation measures, the Consultant shall refer mitigation measures which were applied to similar projects in the past not only in Turkey but also in other countries.

The Consultant shall also estimate the impacts and costs of those measures, and of institutional requirements to implement them, in consideration of compensation to affected parties for impacts which cannot be mitigated.

6.7 Task 8 Development of Environmental Management Plan

The Consultant shall also prepare an environmental management plan (EMP) to manage the proposed mitigation measures and to monitor those implementation and impacts during construction and operation.

In concrete, the EMP should consist of the set of mitigation measures, monitoring, and institutional measures to be taken to eliminate adverse environmental and social impacts. It should include proposed work programs, estimates of capital and operating costs, implementation schedules, staffing, and capacity development and training programs, and other necessary support services to implement the mitigating measures.

6.8 Task 8 Development of Resettlement Action Plan

The Consultant shall prepare a policy and framework and also an action plan for resettlement to ensure that resettlement would be taken place without any conflicts and that sufficient compensation would be provided to affected people. The Resettlement Action Plan (RAP) shall include the following: Analysis of alternatives and assessment of resettlement sites, Details of land requirements, Census data and socio-economic assessment, Entitlement framework, Public Involvement process and Grievance procedures, Implementation Mechanisms, Livelihood and income restoration Programs, Institutional and organizational framework, capacity and responsibilities, Resettlement budget, Environmental protection and management, Implementation plan, Implementation schedule, Monitoring and evaluation etc.

6.9 Task 9 Assistance in Procedures of Public Participation and Disclosure of Information

The Consultant shall assist *(Name of Project Owner)* in coordination with related governmental agencies for all EIA process, in conducting public participation meetings and disclosure process to obtain views of local NGO's and affected groups, and also in keeping records of meetings and other activities, communications, and comments and their disposition during public participation meetings and commission meetings.

7 Report

The Consultant shall provide an EIAt report in the general format, which is prescribed in ANNEX III of Gazette No. 26939 "By-Law On Environmental Impact Assessment (EIA)" as shown in Attachment 1.

Aside from the general format for submission to Ministry of Environment and Forestry (MoEF), the Consultant shall also provide another version of an EIA report in consideration of submission to international agencies for funding. It should be concise and limited to significant environmental issues. The EIA report shall consists of the following items:

a) Executive summary
b) Policy, legal, and administrative framework

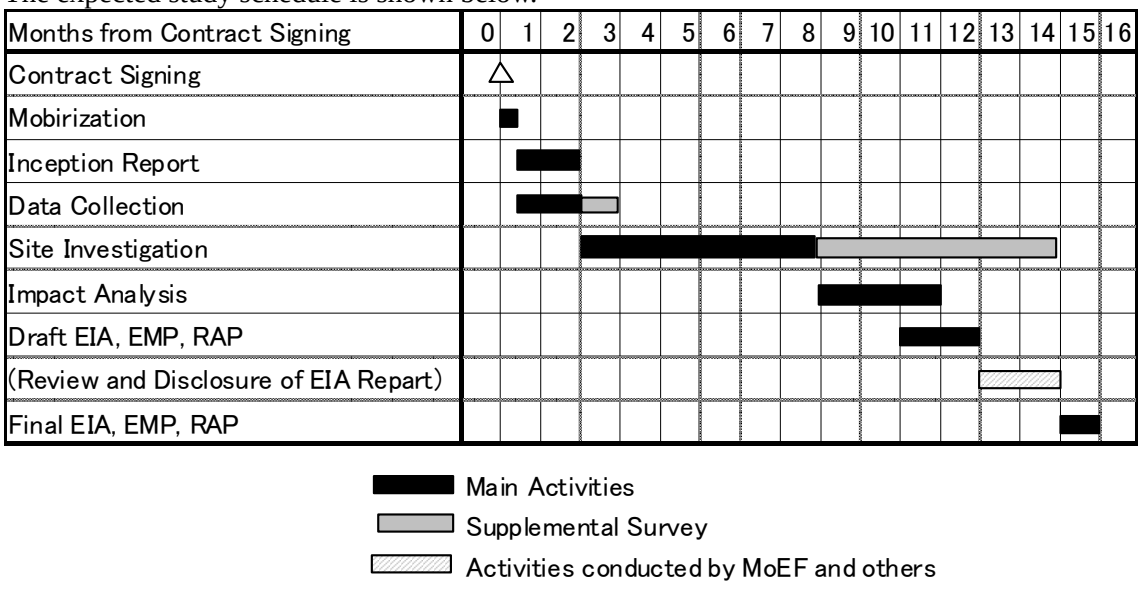
c) Project description
d) Environmental Baseline data
e) Environmental impacts
f) Analysis of alternatives
g) Environmental management plan
h) Appendices
   (i) List of EA report preparers--individuals and organizations.
   (ii) References--written materials both published and unpublished, used in study preparation.
   (iii) Record of public participation meetings and commission meetings, including consultations for obtaining the informed views of the affected people and local nongovernmental organizations (NGOs). The record specifies any means other than consultations (e.g., surveys) that were used to obtain the views of affected groups and local NGOs.
   (iv) Tables presenting the relevant data referred to or summarized in the main text.
   (v) List of associated reports:
      - Environmental Management Plan
      - Resettlement Action Plan, and
      - Other reports, if required

8 Consulting Team

The general skills required of an environmental assessment team are: environmental management planning, socio-economics, ecology, hydrology/hydrogeology analysis. The project team will consist of an environmental specialist, a socio-economist, a terrestrial biologist, an aquatic biologist, a hydrologist, and a geologist internationally and locally. Apart from the specialists, a field coordinator and data collectors will be required.

9 Schedule

It may take 15 months to complete the EIA study from the date of signing the contract.
The expected study schedule is shown below.



ENVIRONMENTAL IMPACT ASSESSMENT GENERAL FORMAT [1]

Title Page:

Name, address, phone and fax number of project owner:
Name of Project:
Name and Location of the Place of Project:
Name, address, telephone and fax numbers of the working group / institution which prepared the report:
Preparation date of report:
Table of Contents:

Part I: Definition and Objective of the Project

Definition, life period, service purposes, importance, and necessity of project investment:
Physical characteristics of the project, amount and characteristics of land to be used in the construction and operation phases:
General explanation of major environmental impacts which the proposed project may cause (water, air, soil pollution, noise, vibration, light, temperature, radiation, etc)
Summary of the main alternatives examined by the investor and reasons for choosing the selected area:

Part II: Location of Project Area

Location, coordinates, and information about project area and alternative locations.

Part III: Existing environmental characteristics of project and impact area

Explanation of the demographics, fauna, flora, geological and hydro-geological characteristics, natural disaster situation, soil, water, air (atmospheric conditions), climatic conditions, ownership status, archeological and architectural heritage, landscape characteristics, land-usage status, sensitivity level (in line with the Sensitive Locations List in Annex V) of the environment which may become polluted due to proposed project activities, and interaction between above mentioned factors.

Part IV: Important environmental impacts of project and measures to be taken

1- Presentation of the likely impacts of project which may potentially cause the following issues: (This definition should include short, medium, and long-term, permanent and temporary, negative and positive impacts.)
   a) The area to be used for the project,
   b) Use of natural resources,
   c) The quantity of polluters, (atmospheric conditions and interaction between polluters) explanation of possible problems which may disturb the environment, and minimization of wastes.
2- General presentation of estimation methods to be used in the assessment of likely impacts of investment on environment.
3- Presentation of the measures envisaged to be taken in order to minimize the negative effects on the environment.

Part V: Public participation

1- Methods proposed for determining the public likely to be affected by the project

[1] Annex III of Gazette No. 26939 "By-Law On Environmental Impact Assessment (EIA)"

and reflecting the public opinions in the environmental impact assessment study,

2- Other parties whose opinions are envisaged to be sought,

3- Other relevant information and documents regarding this subject which are available.

Part VI: A non-technical summary of the information obtained in accordance with the above topics

Appendices: The information and documents below which are obtained from various institutions and organizations and used in the preparation of environmental impact assessment application file and techniques which are not submitted in the text of the report:

1- As per the project area and alternatives, if available, landscaping, master plan, application zoning plan, general layout or amendment proposals on these plans,

2- Permits, approvals, licenses, and all other documents etc. which the investor has previously obtained for the project from relevant organizations..

3- Land usage status of the area selected for the project.

Notes and Sources

Introduction of the working group which prepared the environmental impact assessment application file within the scope of Circular Letter on Certificate of Competency:

Name and surname, profession, curriculum vitae, references, and signature indicating that s/he is responsible for the report.

ANNEX – 3

Pictures during Site Survey

Photo 1 Upper Reservoir Site (view from left bank)

Photo 2 View of Kavak Village

Photo 3 A House to be affected (Second House)

Photo 4 A House to be affected (Second House)

Photo 5 A Storage to be affected

Photo 6 Cemetery to be affected

Photo 7 Septic Tank

Photo 8 Pumping-up Facility

Photo 9 Waterway Route (Surge Tank)

Photo 10 Waterway Route (Switchyard Site)

Photo 11 Outlet Site

Photo 12 Gökçekaya Dam (as Lower Dam)

Photo 13 Propagation of Algae in Gökçekaya Reservoir

Photo 14 Discussion with Heads of Villages (Kavak, Egri, Osman)

Photo 15 Discussion with Director of Forestry Department of Nallihan

Appendix 7-7

BY-LAWS
ON
ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

BYLAW

From the Ministry of Environment and Forestry:

BY-LAW ON ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

CHAPTER ONE
Purpose, Scope, Basis, Definitions and Abbreviations

Purpose

ARTICLE 1 – (1) The aim of this Bylaw is to regulate administrative and technical principles and procedures for the process of Environmental Impact Assessment.

Scope

ARTICLE 2 – (1) This Bylaw covers;

a) Monitoring and inspection of the projects which are within the scope of Environmental Impact Assessment before, during, and after operational period,

b) The type and contents of projects for which the Environmental Impact Assessment Application File, Environmental Impact Assessment Report, and Project Introduction File will be required,

c) Administrative and technical principles and procedures to be complied with during Environmental Impact Assessment process,

ç) The studies to be conducted in order to constitute a Scoping and Examining & Evaluation Commission for Environmental Impact Assessment,

d) Training studies which are required for effective and extensive implementation of Environmental Impact Assessment system and for strengthening its institutional capacity.

Legal Basis

ARTICLE 3- (1) This Bylaw was prepared on the basis of Article 10 of Environment Law No. 2872 dated 9.8.1983.

Definitions and Abbreviations

ARTICLE 4- (1): For the purposes of this Bylaw;

a) Ministry: Refers to the Ministry of Environment and Forestry,

b) Environment; Refers to the biological, physical, social, economical, and cultural environment in which living creatures maintain their relations and are in interaction with each other throughout their life,

c) Environmental Impact Assessment (EIA): Refers to the studies to be carried for determining the likely positive or negative impact that the projects will have on the environment; studying possible environmental protection measures relating to these projects in order to minimize negative effects; determining and assessing selected technological alternatives and locations; and monitoring and controlling the implementation of such projects,

ç) Environmental Impact Assessment Introduction File: Refers to the file to be prepared in accordance with the General Format attached to Annex III of this Bylaw,

d) Environmental Impact Assessment General Format; Refers to the general format in Annex III of this Bylaw which covers the specifications, location, likely impacts, and envisaged measures of the projects planned and shown in Annex I of this Bylaw, providing a general introduction of the project and shall be the basis for the preparation of Environmental Impact Assessment introduction file,

e) Environmental Impact Assessment Report: Refers to the report to be prepared in accordance with pre-determined special format for a project shown in Annex I List of this Bylaw or such projects for which “Environmental Impact Assessment is Required” decision has been given by the Ministry,,

f) Environmental Impact Assessment Report Special Format: Refers to the format which shall be the basis for the preparation of Environmental Impact Assessment Report and which defines the main headings to be examined by the Scoping and Examining & Evaluation Commission by taking

into consideration major environmental aspects of the project as defined under the main topics specified in the project presentation general format in Annex III of this Bylaw,

g) The Decision of “No Environmental Impact Assessment is Required”: Refers to the Ministry’s Resolution which states that the projects subject to selection and elimination criteria do not have important environmental effects and that the preparation of Environmental Impact Assessment Report is not required,

ğ) The Decision of “Environmental Impact Assessment is Required”: Refers to the Ministry’s Resolution which states that the environmental impacts of the projects subject to selection and elimination criteria should be examined in more detail and that the preparation of Environmental Impact Assessment Report is required,

h) The Decision of “Environmental Impact Assessment is Positive”: Refers to the Ministry’s Resolution which, by considering the evaluations of Scoping and Examining & Evaluation Commission on Environmental Impact Assessment Report, states that as result of the measures to be taken, the negative environmental impact of the project can be kept at acceptable levels in accordance with the legislation and scientific principles and thus the project is applicable,

ı) The Decision of “Environmental Impact Assessment is Negative”: Refers to the Ministry’s Resolution which, by considering the evaluations of Scoping and Examining & Evaluation Commission on Environmental Impact Assessment Report, states that the realization of project is unadvisable due to the negative impacts of the project on the environment,

i) Environmental Impact Assessment Process: Refers to the process which starts with the application submitted for the fulfillment of environmental impact assessment of the planned project as envisaged in Articles 8 and 16 of this Bylaw and ends with the determination that post-operational works are appropriate,

j) Sensitive Localities: Refers to areas which are sensitive to environmental effects because of their biological, physical, economical, social, and cultural characteristics or where the existing pollution load has reached levels which are harmful to the environment and public health and vicinities which, as given in Annex V of this Bylaw, should be protected in accordance with national legislation and international conventions to which our country is a party to,

k) Impact: Refers to direct or indirect, short- or long-term, temporary or permanent negative or positive changes in the environment caused by preliminary, construction, operation, or post-operation stage of a Project,

l) Impact Area: Refers to the area in which the environmental aspects are effected in a negative or positive way before, during, or after operation of a planned project,

m) Public: Refers to the citizens of Republic of Turkey, foreign citizens residing in Turkey, and associations, organizations or groups consituting one or more such legal persons in accordance with national legislation,

n) Public Participation Meeting: Refers to the meeting which is organized before scoping and special format determination meeting in order to inform the public about project and seek their opinions and recommendations regarding the project,

o) The public concerned: Refers to the public affected or likely to be affected by the planned Project,

ö) Monitoring and control: Refers to the complete works which are carried out to ensure that the project is executed in line with the conditions which were the basis for the decision and without causing negative impact on environmental values during construction, operation, and post-operation stages after decision of "No Environmental Impact Assessment is Required” or “Environmental Impact Assessment is Required” has been made,

p) Scope and Special Format Determination Meeting: Refers to the meeting to be made after Public Participation Meeting in respect of projects which are subject to Environmental Impact Assessment process,

r) Commission: Refers to the Scoping and Examining & Evaluation Commission which is established by the Ministry in order to determine the scope and criteria of the special format given to a project and to examine and assess the Environmental Impact Assessment Report which is prepared in line with these principles,

s) Project: Refers to the investment which is planned to be realized,

ş) Project Presentation File: Refers to the file which is prepared in order to determine whether

application of Environmental Impact Assessment is required for projects which are subject to Selection and Elimination Criteria,

t) Project Owner: Refers to the real or legal person undertaking execution of all the stages of a project which is subject to this Bylaw,

u) Selection and Elimination Criteria: Refers to the criteria which are the basis for preparation of Project Presentation File and which are given in Annex IV of this Bylaw.

PART TWO
General Provisions

Authority

ARTICLE 5 – (1) The authority to give “Environmental Impact Assessment is Positive”, “Environmental Impact Assessment is Negative", “Environmental Impact Assessment is Required”, or “No Environmental Impact Assessment is Required” decision for the projects subject to this Bylaw is the Ministry. However, the Ministry may, when deemed necessary and by determining the limits, assign the authority to give “Environmental Impact Assessment is Required”, or “No Environmental Impact Assessment is Required” decision to the Governorates.

The obligation to prepare environmental impact assessment introduction file, environmental impact assessment report, and project presentation file

ARTICLE 6 – (1) Real and legal persons planning to realize a project within the scope of this Bylaw are obliged to prepare, submit to the relevant authorities the Environmental Impact Assessment Application File and Environmental Impact Assessment Report for the projects subject to Environmental Impact Assessment and Project Presentation File for the projects subject to Selection and Elimination criteria and to realize their project in accordance with the decision made by the relevant authorities.

(2) Public institutions and organizations are obliged to provide any and all information, document, and opinion on the subject which the project owners request pursuant to fulfillment of the provisions of this Bylaw.

(3) No incentive, approval, permission, construction and usage license can be given, no investment can be initiated, nor any tender be awarded for projects subject to this Bylaw unless unless “Environmental Impact Assessment is Positive” decision or “No Environmental Impact Assessment is Required” decision is made.

PART THREE
Environmental Impact Assessment Application Method

Projects which are Subject to the Environmental Impact Assessment

ARTICLE 7 – (1) It is obligatory to prepare Environmental Impact Assessment Report;

a) for the projects which are listed in Annex I of this Bylaw,

b) for the projects which are subject to Selection and Elimination Criteria and for which "Environmental Impact Assessment is Required" decision has been made, and

c) in case of an increase and / or expansion in the capacity of a project within or outside the scope of this Bylaw, for projects whose total capacity increase is equal to or above the threshold value given in Annex I of this Bylaw.

Initiating Environmental Impact Assessment Process and Establishing the Commission

ARTICLE 8 – (1) The project owner shall apply to the Ministry with a petition and 2 copies of Environmental Impact Assessment Application Files which are prepared based on the Environmental Impact Assessment general format as defined in Annex III of this Bylaw.

(2) The Ministry shall examine the information and documents in this application file for conformity. Files which have not been prepared as required shall be returned to the project owner for completion. The project owner shall, after completion of deficiencies, submit the file again to the Ministry.

(3) If it is concluded that the file was prepared correctly, the Ministry shall, by taking into account the information given in the application file, establish a Commission consisting of representatives of relevant institutions and organizations, officials of the Ministry, and project owner

and / or representatives.

(4) A copy of Environmental Impact Assessment application file, as evidence of the application for the project, shall be sent to the relevant Governorate by the Ministry. The governorate shall announce to the public that the project application has been made, Environmental Impact Assessment process has been initiated, and the opinions, questions, and recommendations about the project may be submitted to the Governorate or Ministry until completion of Environmental Impact Assessment process by such methods as announcement, billboard, internet, etc. In addition, the Ministry shall announce that the Environmental Assessment Process regarding project has been initiated and information regarding the Environmental Impact Assessment process may be obtained also by internet. The public shall be able to communicate their opinions, questions, and recommendations regarding the project to above mentioned authorities.

(5) The Ministry shall request the project owner to reproduce the application file in a number to coincide with the number of the Commission members. The transactions envisaged in this article shall be completed within three working days. For projects for which "Environmental Impact Assessment is Required" decision has been made, the project owner shall apply to the Ministry with a petition to which this decision and project presentation file are attached. This file shall be processed as the application file. The Ministry shall examine this file and request the project owner to reproduce the number of files to coincide with the number of assigned Commission members.

(6) The Ministry shall send a copy of the application file attached to a letter stating the place and date of public participation meeting and scope determination meeting to the members of the Commission and invite the Commission for the first meeting. The Commission shall be chaired by the representative of the Ministry and secretariat services of the Commission shall be carried out by the Ministry.

(7) The Ministry, when deemed necessary, and also by taking into consideration the subject and type of project and the characteristics of the location assigned for the project, may invite representatives of universities, institutions, research and expert bodies, professional associations, trade unions, associations and non-governmental organizations as members to the commission meetings.

(8) It is essential that the members who represent the institutions and organizations in the Commission have sufficient professional knowledge and experience and are authorized to give opinions on the subjects limited with the task field of the institutions and bodies which they represent.

Public Participation Meeting

ARTICLE 9 – (1) Prior to Scope and Special Format Determination Meeting of the Commission, a public participation meeting the date of which shall be determined in agreement with the Ministry shall be organized by the owner of the project at the location of the project in order to inform the public and get their opinions and recommendations on the project.

(2) Prior to Environmental Impact Assessment process, the project owner may organize studies such as surveys or seminars in order to inform the public.

a) The place of the meeting shall be determined by the Governorate and the owner of the project and submitted to the Ministry by the Governorate. Care shall be taken in determination of the meeting place in such a way that easy access is ensured to the public most likely expected to be affected by the project.

(b) The project owner shall have an announcement published in a national newspaper and a local newspaper of that vicinity at least 10 days before the date of meeting stating the date, time, place, and subject of the meeting.

c) The meeting shall be chaired by the Provincial Director of Environment and Forestry or an official assigned by him. In the meeting, it shall be ensured that the public is informed about the project and their opinions, questions, and recommendations are taken. The Chairman may ask the participants to give their opinions in writing. The minutes of the meeting, one copy to be kept at the Governorate, shall be sent to the Ministry.

(3) The Governorate shall announce to the public the time schedule and contact information regarding public participation meeting and process in which the public will be able to communicate their opinions and recommendations. Public opinions and recommendations shall be submitted to the Commission in accordance with the time schedule.

(4) The Commission Members, as specified in Article 8, may examine the project application

area prior to Scope and Special Format Determination Meeting and may participate in the public participation meeting in line with the date communicated to them. The secretariat service regarding public participation meeting works shall be carried out by the Provincial Directorate of Environment and Forestry.

Scope and Special Format Determination Meeting of Commission

ARTICLE 10 – (1) Public participation, information, scoping and special format submission procedures shall be completed within twelve working days.

(2) In the first meeting of the Commission aimed for Scope and Special Format Determination ;

a) The project owner shall inform the Commission about his project.

b) Ministry and / or Provincial Directorate of Environment and Forestry shall inform the Commission about public participation meeting. In addition, the those Commission members who have participated in the public participation meeting shall give their opinions and recommendations.

c) In order to determine the scope in which the project should be assessed, the major environmental impacts of the project shall be considered under the main headings in the Environmental Impact Assessment general format in Annex III of this Bylaw be detailed and the scope determined.

ç) Issues which should be added or removed from the format shall be determined by the Commission. The working group which shall prepare the special format and Environmental Impact Assessment Report shall be determined also by taking into account the opinions and recommendations set forth in the public participation meeting.

d) The special format specified by the Commission shall be given by the Ministry to the project owner and / or its representative in the specified time period determined in this article.

(3) Project owner is obliged to submit the Environmental Impact Assessment Report to the Ministry within one year from the submission of the special format. If the Environmental Impact Assessment Report is not submitted or a justified additional time extension is not requested within this period the applications shall be considered void. If the time extension request of project owner is accepted by the Ministry a single additional time extention not exceeding six months can be granted..

Submission of Environmental Impact Assessment Report to the Ministry

ARTICLE 11—(1) Two copies of Environmental Impact Assessment Report, attached to a petition, shall be submitted to the Ministry by the Project owner. The Environmental Impact Assessment Report shall be inspected by the Ministry for compliance with the general format and whether or not it has been prepared by the professional specialists who should have participated in the working group shall be finalized within three working days. In case it is concluded that the Environmental Impact Assessment Report is not compliant with the special format and / or it has not been prepared by the specified working group, the Environmental Impact Assessment Report shall be returned to the project owner in order to fulfill these conditions. In case the revized Environmental Impact Assessment Report is not submitted to the Ministry within three months the applications shall become invalid.

(2) The Environmental Impact Assessment Report which is concluded to comply with the special format shall be reproduced by the project owner in sufficient number and submitted to the Ministry. The Ministry shall send to the members of the Commission the report attached to a letter indicating the date and place of the meeting to be held for inspection and assessment of Environmental Impact Assessment Report.

(3) Initiation of examination and assessment process of project and submission of the Environmental Impact Assessment Report to public opinion shall be announced by the Ministry and Governorate by appropriate means of communication such as billboards, announcement, internet, etc.

(4) Those who wish to examine Environmental Impact Assessment may examine the report in the Ministry center or Provincial Directorate of Environment and Forestry within the specified time schedule beginning from the announcement date and communicate their opinions to the Ministry or Governorate. The opinions notified to the Governorate shall be communicated to the Ministry. These opinions shall be taken into account by the Commission and reflected in the Environmental Impact Assessment Report.

Working procedure of the Commission and Examination of the Environmental Impact Assessment Report

ARTICLE 12 – (1) The Commission shall examine and assess the Environmental Impact Assessment Report within ten working days from the first examination and assessment meeting.

(2) The Commission shall convene with the simple majority of the number of members. The members of Commission shall be assigned within the framework of their authorities, tasks, and responsibilities in the subjects relating to the central or local institutions and organizations which they represent and shall deliver opinions on behalf of their institutions and organizations. The Chairman may ask the participants to give their opinions in writing. The requests of non participation in future meetings by the representatives delivering their opinions in writing shall be assessed by the chairman of the Commission.

(3) The Commission may request the project owner to give detailed information about his project, to provide tools and equipment, and to carry out or have analysis, experiments and measurements carried out, at Ministerial laboratories or private or public institution laboratories which have been authorized by the Ministry.

(4) A witness sample may be utilized if water, soil, etc analyses results are controversial.

(5) The Commission may, if deemed necessary, carry out examinations at the location where the project will be realized or at similar facilities through appointed agency members.

(6) If major deficiencies and errors are discovered in the Environmental Impact Assessment Report the Commission shall request the project owner or relevant institutions to eliminate the deficiencies and correct the errors. In this case the examination and assessment process shall be ceased. The Commission shall not resume the studies until necessary corrections are made and deficiencies are eliminated.

(7) After the Project owner has made necessary corrections and re-submitted the Environmental Impact Assessment Report to the Ministry, the Ministry shall invite the Commission to convene. Upon conducting of the meeting the examination and assessment process shall resume from where they left off.

(8) The project owner can be requested to make changes in the Environmental Impact Assessment Report at most twice. If the changes made are found insufficient by the Commission the case shall be minuted and the application shall be deemed invalid by the Ministry.

(9)The Commission, during examination and assessment meetings, shall examine and assess;

a) Whether Environmental Impact Assessment Report and its appendices are sufficient and appropriate,

b) Whether the examinations, calculations, and evaluations are based on a sufficient level of data, information, and documentation,

c) Whether the likely environmental impacts of the project have been sufficiently and comprehensively examined,

ç) Whether the necessary measures to dissipate likely negative effects have been determined,

d) Whether the public participation meeting has been duly concluded, and the issues highlighted in the public participation meeting have been sufficiently resolved.

(10) The Commission shall finalize its studies within the period specified in the first paragraph. The assessments made by the Commission shall be written and signed by the members to the minutes.

Submission of Final Environmental Impact Assessment Report and Relevant Documents to the Ministry

ARTICLE 13—(1) The project owner shall submit to the Ministry following documents within five working days from the completion of examination and assessment meetings:

a) Two copies of final Environmental Impact Assessment Reports which has been examined and finalized by the Commission,

b) Commitment letter which states that the Final Environmental Impact Assessment Report and its appendices are under its commitment and notarized list of signatories. Public institutions and organizations are not required to submit list of signatories.

(2) If the documents specified in Paragraph 1 are not submitted within the envisaged period without justification the Final Environmental Impact Assessment Report shall be deemed invalid.

The Decision of "Environmental Impact Assessment is Positive" or "Environmental Impact Assessment is Negative"

ARTICLE 14 – (1) Environmental Impact Assessment Report finalized by the Commission shall be opened by the Provincial Directorate of Environment and Forestry and Ministry to receive the opinions and recommendations of the public for ten working days. the Ministry shall take these opinions into account during the decision taking process and said report shall be requested to be reproduced in accordance with the number of Commission members within three working days. Reproduced Final Environmental Impact Assessment Report shall be submitted to the Ministry within five working days.

(2) The Ministry shall give an "Environmental Impact Assessment is Positive" or "Environmental Impact Assessment is Negative" Decision within five working days by taking into account the studies of the Commission on the Report and communicate this decision to the project owner and relevant institutions and organizations in writing. The Governorate shall, by appropriate communication means, announce to the public the content of the decision, reasons constituting the basis for the decision, and that the opinions and recommendations of the public have been reflected in the Final Environmental Impact Assessment Report.

(3) In case that the required investments are not initiated within seven years from the date of "Environmental Impact Assessment is Positive" decision the "Environmental Impact Assessment is Positive" decision shall be deemed invalid.

(4)As per projects for which "Environmental Impact Assessment is Negative" decision was made, the project owner may make a new application in case there is a change in all of the conditions which caused "Environmental Impact Assessment is Negative" decision to be taken..

PART FOUR
Selection and Elimination Criteria Application Method

ARTICLE 15 – (1) The projects;

a) in Annex II of this Bylaw,

b) in case of an increase and / or expansion in the capacity for projects within or outside the scope of this Bylaw, or projects whose total capacity increase is equal to or above the threshold value given in Annex II of this Bylaw are subject to the Selection and Elimination Criteria.

Application and Examination

ARTICLE 16 – (1) The project owner shall submit a petition to the Ministry and request for an examination to determine whether an Environmental Impact Assessment application is required for his project with three copies of Project Presentation Files which shall be prepared according to Annex IV of this Bylaw, a commitment letter which states the information and documents in the presentation File and petition to be true, and a list of signatories.

(2) The Ministry shall examine the project presentation file in line with the criteria specified in Annex IV of this Bylaw within five working days. In case any deficiency in the scope of information and documents are detected in the file the Ministry shall request the project owner to correct the deficiencies.

(3) Project presentation files which are not corrected for deficiencies and submitted to the ministry within six months shall be returned to the project owner and deemed invalid.

(4) The Ministry may, when deemed necessary, examine or have the project area examined on-site.

The Decision of "Environmental Impact Assessment is Required" or "No Environmental Impact Assessment is Required"

ARTICLE 17 – (1) The Ministry shall examine and assess the projects given in (a) and (b) sub-clauses of paragraph (1) of Article 15 in line with the criteria specified in Annex IV of this Bylaw. At this stage, the Ministry, if deemed necessary, may request the project owner to give comprehensive and detailed information regarding the project, to provide required instruments and tools, and to make or have analyses, experiments, and measurements made by institutions with acceptable adequacy..

(2) The Ministry shall complete its studies within fifteen working days, give the "Environmental

Impact Assessment is Required" or "No Environmental Impact Assessment is Required" decision within five working days, and communicate this decision to the Governorate and project owner. The Governorate shall announce this decision to the public.

(3) In case the required investments are not initiated within five years from the date of "No Environmental Impact Assessment is Required" decision, the "No Environmental Impact Assessment is Required" decision shall be deemed invalid.

(4) The justified decision for projects for which "Environmental Impact Assessment is Required" decision has been given shall be communicated to the Ministry. The projects for which "Environmental Impact Assessment is Required" decision has been given pursuant to Article 7 of this Bylaw are subject to Environmental Impact Assessment. according to Article 8 of this Bylaw in case the Environmental Impact Assessment process is not initiated within one year the application shall be deemed invalid.

PART FIVE

Monitoring and Control

Monitoring and Control of the Investment

ARTICLE 18 – (1) The Ministry, as per the projects for which "Environmental Impact Assessment is Positive" or "Environmental Impact Assessment is not required" decision has been taken, shall monitor and control whether the issues which are envisaged in the Environmental Impact Assessment Report or the project presentation file prepared according to Annex IV of this Bylaw and which have been committed to by the project owner are fulfilled or not.

(2) The Ministry, if deemed necessary, shall cooperate with relevant institutions and organizations in fulfilling this task.

(3) Project owner or its authorized representative, following "Environmental Impact Assessment is Positive" or "Environmental Impact Assessment is not required" decision, is obliged to communicate to the Ministry or Governorate the monitoring reports for initiation, construction, operation, and post-operation periods of the investment..

Stopping **Applications Contradictory with the Bylaw**

ARTICLE 19 – (1) As per the projects in scope of this Bylaw;

a) The activities initiated without Environmental Impact Assessment shall be ceased by the Ministry and those initiated without preparing a project presentation file shall be ceased by the highest administrative authority of that locality. The decision for stay of investment shall not lifted unless "Environmental Impact Assessment is Positive" or "No Environmental Impact Assessment is Required" decision is taken. The case shall be processed according to the relevant provisions of Environment Law No 2872.

b) If after the "Environmental Impact Assessment is Positive" or "No Environmental Impact Assessment is not Required" decision has been taken it is determined that the project owner does not fulfill the conditions envisaged and committed in the Final Environmental Impact Assessment Report or project presentation file, the Ministry / Governorate may grant a single time extention in order to ensure the fulfillment of such conditions by the project owner,. If the committed issues are not fulfilled at the end of this period the investment shall be ceased. This decision for stay of investment shall not be removabable unless all the commitments are fulfilled by the project owner. The case shall be processed according to the relevant provisions of Environment Law No 2872

PART SIX
Miscellaneous and Last Provisions

Time Extensions and Cessation

ARTICLE 20 – (1) The time periods specified in this Bylaw, upon request of project owner and

approval of Ministry or in cases which the Ministry directly deems necessary, may be extended or ceased by the Ministry by providing justification. The time periods given to the project owner to correct deficiencies in reports and carry out additional transactions shall not be included in the Environmental Impact Assessment process.

Change of Project owner

ARTICLE 21 – (1) In case the project owner changes for any reason the new owner shall be deemed to have committed and engaged all the commitments and obligations of former project owner which shall be communicated to the Ministry in writing.

Strengthening of Environmental Impact Assessment Applications

ARTICLE 22 – (1) The Ministry may, in relation with the Environmental Impact Assessment applications and when deemed necessary, carry out any and all kinds of training, planning, program, and project studies; prepare books, booklets, guidelines, and all types of documents; and organize seminars and meetings in cooperation with domestic and foreign institutions and organizations.

Military Projects

ARTICLE 23 – (1) Environmental Impact Assessment applications of military projects shall be determined by the Ministry by considering the opinion of the relevant institution.

Extra-Ordinary Situations and Special Provisions

ARTICLE 24 – (1) The procedure to be applied for the following projects shall be determined by the Ministry:

a) Projects which are planned to be re-establish in part or wholly such investments in areas where they have been demolished, destroyed, ruined, or damaged as result of natural disasters,

b) Projects deemed appropriate by the Ministry upon the application of project owner for the purpose of obtaining loans for projects which are not subject to Environmental Impact Assessment Bylaw or which are subject to Selection and Elimination Criteria or for similar financial reasons.

c) Projects which are planned to be established in Organized Industrial Zones, Specialist Organized Industrial Zones, Industrial Zones, Free Zones, areas for which Strategic Environmental Assessment will be carried out, Potential Aquaculture Production Areas, and Technological Development Zones,

ç) Projects which include advanced technolog, modifications or which prototype production projects,

d) Projects including any and all modifications to be made on the projects without any threshold value which are specified in Annex I or Annex-II of this Bylaw.

Integrated Projects

ARTICLE 25 – (1) In case an integrated project consisting of several projects each of which is subject to this Bylaw is planned, the Ministry shall request the project owner to prepare a single Environmental Impact Assessment Application File / Project Presentation File for the integrated project.

Certificate of Competency

ARTICLE 26 – (1) The institutions and organizations which shall prepare Environmental Impact Assessment Application File, Environmental Impact Assessment Report, or Project Presentation File are obliged to obtain a Certificate of Competency from the Ministry. The principles and procedures for giving Certificate of Competency, monitoring of the institutions and organizations having Certificate of Competency, and termination of this certificate shall be regulated by the Circular Letter to be prepared by the Ministry.

Circular Letters

ARTICLE 27 – (1) The Ministry, when deemed necessary, may issue circular letters regarding implementation of this Bylaw.

Abolished Regulation

ARTICLE 28 - (1) The Bylaw on Environmental Impact Assessment, published in the Official Gazette No. 25318 dd. 16 December 2003 has been abolished.

Projects for which the Environmental Impact Assessment Process has Been Initiated

PROVISIONAL ARTICLE - (1) Projects which are subject to the Bylaw on Environmental Impact Assessment published in the Official Gazette No 21489 dd. 7 February 1993, Bylaw on Environmental Impact Assessment published in the Official Gazette No 23028 dd. 23 June 1997, Bylaw on Environmental Impact Assessment published in the Official Gazette No 24777dd. 6 June 2002 , Bylaw on Environmental Impact Assessment published in the Official Gazette No 25318 dd. 16 December 2003 but do not fulfill the obligations specified in the said Bylaws shall be subject to the provisions of this Bylaw.

Transition Period

PROVISIONAL ARTICLE 2 – (1) Projects for which Project Presentation Files have been submitted to the Governorate or Ministry and Environmental Impact Assessment Reports have been submitted to the Ministry before the effective date of this Bylaw shall be governed by the provisions of relevant subject Bylaw.

Out of Scope Projects

PROVISIONAL ARTICLE 3 – (1) As per the projects whose application projects have been approved, for which required approval, permit, license, or expropriation decision has been taken, which have been included in the investment program, or whose local zoning plans have been approved before the Bylaw on Environmental Impact Assessment published in the Official Gazette No 21489 dd. 7 February 1993 and those with documented proof of production initiation and / or operation stage inception before this date the provisions of this Bylaw shall not apply, without prejudice to the provisions regarding permits envisaged by the Environment Law and other relevant Bylaws.

Transactions Until the Date of 1 September 2008

PROVISIONAL ARTICLE 4 – (1) The provisions of the Circular Letter on Certificate of Competency published in the Official Gazette No. 25383dd. 24 February 2004 are valid for institutions and organizations which shall prepare Environmental Impact Assessment until 1 September 2008 However, the condition of having Certificate of Competency shall not be applied to the institutions and organizations which prepare Environmental Impact Assessment Application Files or Project Presentation Files before 1 September 2008. However, said Environmental Impact Assessment Application File or Project Presentation File shall be prepared by individuals having at least a bachelor's degree education from three different profession groups depending on the location and type of relevant project.

Enforcement

Article 29 - (1) This Bylaw shall enter into force on the date of its issue.

Execution

Article 30 - (1) The provisions of this Bylaw shall be executed by the Minister of Environment and Forestry.

ANNEX – 1 LIST

THE LIST OF PROJECTS TO WHICH ENVIRONMENTAL IMPACT ASSESSMENT SHALL BE APPLIED

1- Refineries:

a) Crude oil refineries,

b) Projects for gasification and liquefaction of 500 tons or more of coal or bituminous materials per day,

c) Natural gas liquidation and gasification facilities.

2- Thermal power plants:

a) Thermal power stations and other combustion installations with a heat output of 300 megawatts or more,

b) Erection and dismantling of nuclear power stations and other nuclear reactors (except research installations for the production and conversion of fissionable and fertile materials, whose maximum power does not exceed 1 kilowatt continuous thermal load).

3- Installations for the reprocessing of irradiated nuclear fuel:

a) Installations designed for reprocessing nuclear fuels,

b) Installations designed for the production or enrichment of nuclear fuel,

c) Installations designed for the processing of irradiated nuclear fuel or high-level radioactive waste,

ç) Installations designed for the final disposal of irradiated nuclear fuel,

d) Installations designed solely for the final disposal of radioactive waste,

e) Installations designed solely for the storage (planned for more than 10 years) of irradiated nuclear fuels or storage of nuclear waste on a site different from the production site,

f) Final disposal of non-radiated nuclear fuel.

4- Facilities for the smelting of cast-iron and steel:

a) Facilities producing rolled product from ore,

b) Facilities producing scrap-based liquid steel (50.000 tons/ year and more),

c) Rolling plants (50.000 tons/ year and more),

ç) Casting plants (50.000 tons/ year and more),

d) Non-ferrous crude metal facilities (smelting or Rolling or casting) (25.000 tons/ year and more).

5- Installations for the production of non-ferrous crude metals from ore, concentrates or secondary raw materials by metallurgical, chemical or electrolytic processes.

6- Installations for the extraction of asbestos and for the processing and transformation of asbestos and products containing asbestos:

a) Asbestos mine operations and enrichment facilities,

b) Facilities for friction material, with an annual production of more than 50 tons of finished products,

c) Facilities for other uses of asbestos, utilization of more than 200 tons per year,

ç) Facilities For asbestos-cement products, with an annual production of more than 10,000 tons of finished products.

7- Integrated chemical installations for industrial scale manufacture of substances using chemical conversion processes, in which various units are juxtaposed and functionally linked to one another and which are;

a) for the production of organic chemicals;

b) for the production of inorganic chemicals;

c) for the production of simple or compound phosphorous-, nitrogen- and potassium-based fertilizers ;

8- Facilities producing explosive and inflammable materials.

9- Motorways, transits, and airports:

a) Inter-city railway lines,

b) airports with a basic runway length of 2,100 meters or more,

c) Construction of motorways express roads and public roads;

ç) Construction of a new road of four or more lanes, or realignment and/or widening of an existing road of two lanes or less so as to provide four or more lanes, where such new road, or realigned and/or widened section of road is extended uninterruptedly for 10 kilometers or more.

10- Waterways, ports, and shipyards:

a) Inland waterways and ports for inland-waterway traffic which permit the passage of marine vessels of over 1,350 tons,

b) Trading ports, jetties and docks (excluding sundecks and recreational jetties) which can berth marine vessels over 1,350 tons,

c) Ship-building yards for the construction, maintenance, disassembly, and repair of freight and passenger vessels and manufacturing facilities for yachts over 24 meters,

ç) Yacht marinas.

11- Hazardous and specially processed wastes:

a) Waste disposal installations for the recovery and / or final disposal of hazardous and specially processed wastes,

b) Waste incineration installations for the incineration of medical wastes with a capacity exceeding 1000 tones per day,

c) Medical waste land-fill installations with a filling capacity exceeding 1 ton and more per day,

ç) Facilities designed for waste oil recovery with a capacity equal to and above 2.000 tones per year,

d) Waste dams, waste basins containing hazardous wastes.

12- Facilities designed to dispose or subject to the intermediate process solid wastes over 100 tons per day with composting, incineration or other techniques and / or solid waste land-fill facilities, waste dams, and waste basins with a total area exceeding 10 hectares or daily landfilling storage capacity over 100 tons including target year.

13- Groundwater extraction or underground water storage projects with an annual water volume of 10 million cubic meters or over.

14- Works for the transfer of major water sources, other than piped drinking water:

a) Works for the transfer of water sources between river basins where the aim of the transfer is to prevent possible water shortages and where the amount of transferred water is100 million cubic meters per year and over;

b) In all other cases, works for the transfer of water resources, other than piped drinking water, between river basins where the long term annual average flow of the basin of extraction exceeds 2,000 million cubic meters per year and where the amount of transferred water exceeds 5% of this flow.

15- Water storage facilities (dams and lakes with a reservoir volume of 10 mio m3 and over).

16- River type power plants with an installed capacity of 25 MW or more.

17- Waste water treatment plants with a capacity exceeding 150,000 population equivalency and / or 30.000 cubic meter capacity per day.

18- Meat products production facilities (facilities where slaughtering and meat product production are made together):

a) Facilities for bovine animal slaughtering and meat production (500 heads and over per day),

b) Facilities for ovine animal slaughtering and meat production (1500 heads and over per day),

c) Facilities for poultry slaughtering and meat production (200.000 poultry or over and equivalent fowl per day).

19- Bovine and / or ovine animal husbandry facilities (10.000 or more bovine, 20.000 or more ovine capacity).

20- Installations for rearing poultry and pigs with capacities of:

a) Chicken or broiler rearing facilities (with 60.000 or more chickens, 85.000 broilers or equivalent fowl or more during one production period);

b) Pig rearing facilities (30 kg and over, more than 3000 head)

c) Sow rearing facilities (900 heads and over).

21- Aquaculture projects (1.000 or more tons per year).

22- Integrated oil production facilities (facilities where raw-oil extraction from crops and refinement process is carried out together).

23- Integrated milk products production facilities (facilities where at least two sorts of milk product such as cheese, butter, or yogurt are produced from 50 or more tons of milk per day).

24- Yeast factories.

25- Sugar factories.

26- Forest and cellulose product facilities;

a) Cellulose production facilities,

b) the production of pulp from timber or similar fibrous materials;

c) The production of all kinds of paper (with a production capacity exceeding 40.000 tons per year).

27- Filature, fabric, or carpet mills containing bleaching agents (desizing, bleaching, mercerizing, causticization, or similar) or dyeing units (3.000 tons or more per year).

28- Mining projects;

Regardless of license law and stage,

a) Open quarries and ore dressing facilities with a working area of 25 or more hectares (total for excavation and dumping area),

b) Open pit coal extraction and ore dressing facilities where the working area exceeds 150 hectares (total for excavation and dumping area),

c) Ore enrichment facilities applying biological, chemical, electrolyte, or heat treatment methods,

ç) Operating 1^{st} and 2^{nd} group mines with all kinds of processes (crushing – screening, grinding, washing, and similar) with a capacity of 100.000 cubic meters or more per year.

29- Extraction of raw oil (500 tons or more per day) and natural gas (500.000 cubic meters or more per day),

30- Pipelines for the transportation of gas, oil or chemicals with a diameter over 600 mm and a length of more than 40 km.

31- Cement factories or clinker production facilities.

32- Construction of overhead electrical power lines with a voltage of 154 kV or more and a length of more than 15 km (transmission line, transformer center, switch areas).

33- Petroleum, natural gas, petro-chemical, and chemical substance storage facilities with a capacity of 50.000 cubic meters or more.

34- Raw hide processing facilities (excluding those obtaining end product from processed raw hide) with a capacity of 500 tons or more per year.

35- Tourist accommodation facilities (500 or more rooms), holiday villages, and / or tourist complexes.

36- Expert Industrial Zones (activities included in Annex I and Annex II).

37- Battery and Accumulator production facilities (excluding assembly operations),

38- Facilities where active pesticide substances and / or pharmaceutical products are produced.

39- Motor vehicle production.

40- Railway vehicle production.

41- Aircraft production.

42- Glass, fiberglass, or rock wool production facilities (100.000 tons or more per year).

43- Rubber production facilities (inner- and outer-tire for motor cars and air-crafts, column, back rubber, cord fabric, and similar).

44- Ceramic, roofing tile, brick, or porcelain production facilities (those with a main raw material capacity over 100.000 tons per year).

ANNEX – II LIST

LIST OF THE PROJECTS TO WHICH SELECTION AND ELIMINATION CRITERIA ARE APPLICABLE
(The Lower Bounds in Annex I List are Accepted as the Upper Bound in This List)

Chemicals, Petro-chemical Products, Drugs, and Wastes

1 – a) Facilities designed for the production of chemical substances, production of lubrication substance from petroleum, and processing of intermediate-products (facilities without process-sourced waste and by-product and only prepare the mixture are outside this scope.),

b) Facilities designed for waste oil recovery (whose processing capacity is less than 2.000 tons per year),

c) Medical waste incineration facilities with an incineration capacity between 200-1000 kg per day, medical waste land fill facilities with a daily storage capacity of less than 1 ton, and facilities designed for the intermediate physical and chemical treatment of medical wastes,

ç) Recovery of hazardous and specially processed wastes by physical methods.

2- Petroleum, natural gas, petro-chemical, and chemical substance storage facilities with a total storage capacity between 500 and 50.000 cubic meters (excluding retail sales stations).

3- Facilities where pesticides, pharmaceutical products, paints and varnishes, elastomeric-based products, and peroxides are produced or the elastomeric-based products are treated, plant growth regulators.

4- Facilities designed for incineration, composting, and storage of solid wastes, waste dams, and waste basins.

5- Facilities producing soap and detergent (facilities which purchase the raw material and make only the mixture are outside this scope).

6- Facilities designed for recovery and disposal of poultry-house and stable manures.

7- Explosive and inflammable substance depots with a total storage capacity over 500 tons.

Industrial Facilities

8- Iron, steel or non-ferrous metal facilities (with a capacity of 1.000 tons or more per year):

a) Facilities where iron-steel or non-ferrous metals are melted and produced,

b) Rolling facilities or facilities where the rolling operation is not carried out but includes an annealing furnace with a nominal thermal power of ≥10 MW,

c) Casting factories,

ç) Pipe producing facilities,

d) Facilities producing or treating metal dust.

9- Coating facilities:

a) Facilities where metal or plastic surfaces are coated with with metal with electrolytic or chemical processes, and where metals are applied with surface treatment (excluding mechanical treatment),

b) Glazing or enameling facilities,

c) Rubber coating facilities,

10- Textile facilities

a) Filature, fabric, or carpet mills utilizing dyeing process (by utilizing chemical or vegetable dyes), bleaching agents, or printing process,

b) Industrial type facilities where wool or angora is rubbed, de-oiled, and bleached,

c) Denim or garment industry products washing facilities

11- Glass, fiberglass, or rock wool production facilities

12- All kinds of paper production facilities

13- Cellulose processing facilities

14- Raw hide processing facilities (excluding those obtaining end product from processed raw hide).

15- Air craft repair facilities

16- Internal combustion engines production

17- White appliances production and painting facilities

18- The facilities where on-vehicle equipment such as damper, car-body, etc are produced and painted

19-Ready Mixed Concrete Facilities, facilities producing shaped materials by using methods such as compression, blast, vibration, or concussion and materials such as cement or other bounding materials, and those which produce pre-stressed concrete elements, gas concrete, etc.

20- Facilities which produce brick or roof tile.

21- Facilities which produce ceramic or porcelain. (where kiln-drying is operated)

22- Clinker grinding facilities.

Agriculture, forestry, aquaculture, and food

23- Projects regarding production of plant products:

a) Raw and refined vegetable oil production facilities,

b) Facilities which produce starch,

c) Facilities which produce alcoholic beverages with fermentation or malt facilities,

ç) Cigarette factories,

24- Projects regarding production of animal products:

a) Manufacture of animal fats,

b) Water products processing facilities,

c) Milk products processing facilities (with the capacity of 5 tons / day – 50 tons / day),

ç) Aquaculture projects (30 - 1.000 tons / year),

d) Fish hatcheries (40 million and more seed fish production capacity per year),

e) Bovine animal (50 and more per day) and / or ovine animal (300 and more per day) slaughtering facilities,

f) Facilities for the slaughter of poultry (10.000 and more per day),

g) Rendering facilities.

25- Projects aiming to change land usage characteristics:

a) Projects aiming to re-structure agricultural lands without changing the intended use (500 hectares and over),

b) Projects aiming to use un-processed or semi-processed lands for agricultural or forestry purposes (500 hectares or over),

c) Projects for transformation of forest areas for other intended uses (500 hectares and over),

ç) Water management projects with agricultural purposes (1.000 hectares and over).

26- Animal husbandry facilities:

a) Bovine and / or ovine animal husbandry facilities (50-1.000 bovine animals, 1.000-20.000 ovine animals),

b) Hen or chicken breeding facilities (20.000-60.000 hens, 30.000-85.000 chickens or equivalent poultry per production period),

c) Fur animal breeding facilities (5.000 units or more per year),

ç) Pig breeding facilities (1.000-3.000 places for over 30 kg and more),

d) Sow breeding facilities (300-900 heads).

Communication, infrastructure, and shore structures

27- Infrastructure facilities:

a) Projects aiming to transfer water between water-course basins (those not included in Annex I),

b) Inland-waterway construction (not included in Annex I),

c) Arrangement of watercourse beds (excluding dry creeks and those with seasonal flow),

ç) Construction of harbors, jetties, ports (not included in Annex I),

d) Fishing ports and tugboat ports,

e) Projects aiming to acquire 10.000 square meters of land from the marine environment,

f) Coastal work to combat erosion and works capable of altering the coast through the construction of, for example, dykes, moles, jetties and other sea defense structures (excluding maintenance and repair of such structures),

g) Railway lines (projects not included in Annex I),

ğ) Construction of transfer-purpose facilities in railway transportation, and railway terminals,

h) Tramways, elevated and underground railways, similar lines used for passenger transport (metro, light rail transport system and the like),

ı) Airports (projects not included in Annex I),

i) Provincial roads,

j) Dragnet projects,

k) Harbor launches (facilities providing harboring, maintenance, repair, accommodation, launching services for yachts and vessels, or where yachts up to 24 meters are manufactured),

l) Groundwater extraction and groundwater storage projects with a capacity of 1 million cubic meters or more per year,

m) Water storage facilities (dams and lakes with a reservoir capacity of 5 million cubic meters or more),

n) Deep sea discharge projects.

Energy, Tourism, Housing

28- River type power plants having 0.5 MW or more installed capacity.

29- Wind power plants having 10 MW or more installed capacity.

30- Extraction of geo-thermal sources and facilities using geo-thermal energy (having 5 MWt-megawatt or more thermal capacity),

31- Industrial installations for the production and/or transport of electricity, gas, steam and hot water (10 MW and more),

32- 154 kV or more energy transmission facilities (5 kilometers or more).

33- Mass-housing projects (200 housings and more),

34- Tourist accommodation facilities (hotels, holiday villages, and / or tourist complexes with 100 or more rooms),.

35- Training campuses,

36- Permanent camping and caravan facilities having 50.000 square meters or more area,

37- Theme parks (recreational parks where the public pay to enter for entertainment purposes, installed on wide areas),

38- Ski areas and mechanical facilities,

39- Permanent race and test tracks for cars and motor-cycles,

40- Sports complexes and hippodromes,

41- Golf facilities.

Mining

42- Mining projects;

Regardless of license law and stage,

a) Extraction of mines (projects not included in the Annex I),

b) Extraction and processing of block and partial marble, decorative stones (5.000 cubic meters or more per year) and marble cutting, processing and sizing facilities (250.000 square meters capacity or more per year),

c) Extraction and storage of methane gas (1.000.000 cubic meters or more per year), ,

ç) Facilities where carbon dioxide and other gases are extracted, stored, or processed (10.000 tons / year or more),

d) Operating 1st and 2nd group mines with all kinds of processes (crushing – screening, grinding, washing, and similar) (those excluded from Annex I),

e) Ore enrichment and preparation facilities (those excluded from Annex I).

43- Extraction and / or all kind of salt processing facility with a capacity of 50.000 tons/year or more per year.

44- Coal processing facilities

a) Gas and coke factories,

b) Coal briquetting facilities,

c) Coal washing facilities,

45- Storage, classification, and packaging facilities for petro-coke, coal, and other solid fuels (excluding retail sales units),

46- Lime factories and / or plaster factories.

47- Projects which are listed in Annex I but have been prepared with the purpose of trying or developing a new product or method for a period not longer than two years.

ANNEX -III

ENVIRONMENTAL IMPACT ASSESSMENT GENERAL FORMAT

Title Page:
Name, address, phone and fax number of project owner:
Name of Project:
Name and Location of the Place of Project:
Name, address, telephone and fax numbers of the working group / institution which prepared the report:
Preparation date of report:
Table of Contents:

Part I: Definition and Objective of the Project

Definition, life period, service purposes, importance, and necessity of project investment:
Physical characteristics of the project, amount and characteristics of land to be used in the construction and operation phases:
General explanation of major environmental impacts which the proposed project may cause (water, air, soil pollution, noise, vibration, light, temperature, radiation, etc)
Summary of the main alternatives examined by the investor and reasons for choosing the selected area:

Part II: Location of Project Area

Location, coordinates, and information about project area and alternative locations.

Part III: Existing environmental characteristics of project and impact area

Explanation of the demographics, fauna, flora, geological and hydro-geological characteristics, natural disaster situation, soil, water, air (atmospheric conditions), climatic conditions, ownership status, archeological and architectural heritage, landscape characteristics, land-usage status, sensitivity level (in line with the Sensitive Locations List in Annex V) of the environment which may become polluted due to proposed project activities, and interaction between above mentioned factors.

Part IV: Important environmental impacts of project and measures to be taken

1- Presentation of the likely impacts of project which may potentially cause the following issues: (This definition should include short, medium, and long-term, permanent and temporary, negative and positive impacts.)
a) The area to be used for the project,
b) Use of natural resources,
c) The quantity of polluters, (atmospheric conditions and interaction between polluters) explanation of possible problems which may disturb the environment, and minimization of wastes.
2- General presentation of estimation methods to be used in the assessment of likely impacts of investment on environment.
3- Presentation of the measures envisaged to be taken in order to minimize the negative effects on the environment.

Part V: Public participation

1- Methods proposed for determining the public likely to be affected by the project and reflecting the public opinions in the environmental impact assessment study,
2- Other parties whose opinions are envisaged to be sought,
3- Other relevant information and documents regarding this subject which are available.

Part VI: A non-technical summary of the information obtained in accordance with the above topics

Appendices: The information and documents below which are obtained from various institutions and organizations and used in the preparation of environmental impact assessment application file and techniques which are not submitted in the text of the report:

1- As per the project area and alternatives, if available, landscaping, master plan, application zoning plan, general layout or amendment proposals on these plans,

2- Permits, approvals, licenses, and all other documents etc. which the investor has previously obtained for the project from relevant organizations..

3- Land usage status of the area selected for the project.

Notes and Sources

Introduction of the working group which prepared the environmental impact assessment application file within the scope of Circular Letter on Certificate of Competency:

Name and surname, profession, curriculum vitae, references, and signature indicating that s/he is responsible for the report.

ANNEX-IV

SELECTION AND ELIMINATION CRITERIA WHICH ARE THE BASIS FOR THE PROJECT PRESENTATION FILE

Title Page:

Name, address, telephone and fax number of project owner:

Name of Project:

Name and Location of the Place of Project:

Definition and Objective of Project

Name, address, telephone and fax numbers of the working group / institution which prepared the report:

Preparation date of report:

1. Project Characteristics

In the project characteristics, following issues should be taken into account:

a) Flow process chart of the project, its capacity, area to be covered, technology, number of personnel to be employed,

b) Use of natural resources (land use, water use, type of energy to be used, etc.)

c) Amount of waste to be produced (solid, liquid, gas, etc) and chemical, physical, and biological characteristics of wastes,

ç) Risk of accident which may arise due to technology and materials to be used in the project,

d) Measures to be taken against the likely environmental impacts of the project,

2. Place of Project

Following issues should be taken into account when assessing the sensitivity of an area likely to be affected by the project:

a) Existing land use and quality (agricultural area, forest area, planned zone, water surface, and similar),

b) By taking into account the list of sensitive areas in Annex V; the wetlands, coastal departments , mountain- and forest areas, agricultural areas, national parks, special protection areas, densely populated areas, historical, cultural, archeological, and similar important areas, erosion areas, landslide areas, forested areas, potential erosion and forestation areas and aquifers which must be protected pursuant to the Law No. 167 dd. 16 December 1960 on Ground-Waters.

3. Alternatives of the project and project area (reasons for the selection of project technology and project area)

Conclusion

This consists of a summary of all the explanations and a general evaluation in which the important environmental effects of the project are listed and the alternatives are compared.

APPENDICES:

As per the project area and alternatives, if available, landscaping, master plan, application zoning plan, general layout or amendment proposals on these plans,

In order to assess the existing land use of the project area and its close vicinity; the information showing the locations of settlement areas, transportation networks, energy transmission lines, existing facilities, and other areas specified in the List of Sensitive Areas in Annex V of this Bylaw (in case they are in the vicinity of the project area) shall be briefly explained by processing the data onto the existing 1/25.000 scale map (if available, the environment plan, otherwise the topographical map),

Scaled geological map of the project area, the locations of surface and ground waters on this map, and explanation of earthquake status of the area.

Notes and Sources

Introduction of those who prepared the Project Presentation File within the scope of Circular Letter on Certificate of Competency:

Name and surname, profession, curriculum vitae, references, and signature indicating that s/he is responsible for the report.

ANNEX-V

SENSITIVE AREAS

The list of legislation which must be consulted during project studies within the scope of this Bylaw is as follows: The changes which may incur in the legislation are an inherent part of this section.

1. The areas which must be protected pursuant to our national legislation

a) “National Parks”, “Natural Parks”, “Natural Monuments”, and “Nature Conservation Areas” which are defined in Article 2 and determined by Article 3 of National Parks Law No. 2873 dd. 9 August 1983 ,

b) “Wild Life Conservation and Wild Animals Settlement Areas” which are determined by the Ministry of Environment and Forestry pursuant to Law No. 4915 dd. 1 July 2003 on Land Hunting,

c) The areas which are defined as “Cultural Heritage”, “Natural Heritage”, “Archeological Protected Areas", and "Conservation Areas" in sub-clauses 1, 2, 3, and 5 of paragraph (a) with the heading "Definitions" of First Clause of Article 3 of Law No” 2863 dd. 21 July 1983 on Cultural and Natural Heritage Conservation and which were determined and registered pursuant to the relevant articles of same law and Law No. 3386 dd. 17 June 1987 (amending some articles and adding new ones to Law No” 2863 dd. 21 July 1983 on Cultural and Natural Heritage Conservation”).

ç) Aquaculture Production and Breeding Areas within scope of Law No. 1380 dd. 22 March 1971 on Aquaculture,

d) The areas defined in Articles 17, 18, 19, and 20 of Bylaw on Water Pollution Control published in the Official Gazette dd. 31 December 2004 No. 25687,

e) “Sensitive Pollution Areas” which are defined in Article 49 of Bylaw on Air Quality Protection published in the Official Gazette dd. 2 November 1986 No. 19269,

f) The areas which were defined and announced “Special Environment Protection Areas” by the Council of Ministers pursuant to Article 9 of Environment Law No. 2872 dd. – August 1983,

g) The areas taken under protection pursuant to Law No. 2960 dd. 18 November 1983 on the Bosphorus,

ğ) The areas considered as forest area pursuant to Law No. 6831 dd. 31 August 1956 on Forestry,

h) The areas where are subject to a building ban pursuant to Law No 3621 dd. 4 April 1990 on Coastal Areas,

ı) The areas defined in Law No. 3573 dd. 26 January 1939 regarding Olive Growing and Grafting Wild Olives,

I) The areas specified in Pasture Law No. 4342 dd. 25 February 1998 ,

j) The areas specified in enacted Bylaw on Wetlands Conservation published in the Official Gazette dd. 17 May 2005 No 25818.

2. Areas protected pursuant to international conventions which our country is party to

a) Class I and II Conservation Areas specified in “Major Breeding Areas of Sea Turtles” which have been taken under protection pursuant to Convention on the conservation of European wildlife and natural habitats (Bern Convention) (published in the Official Gazette dd. 20 February 1984 No. 18318), “Mediterranean Seal Habitat and Breeding Areas”,

b) The areas which have been taken under protection pursuant to 1976 Barcelona Convention for Protection against Pollution in the Mediterranean Sea (published in the Official Gazette dd. 12 June 1981 No. 17368,

ı) The areas which have been determined as "Special Protection Area" in our country pursuant to the "Protocol on the Protection of Special Protection Areas in the Mediterranean" published in the Official Gazette dd. 23 October 1988 No. 19968,

ii) The areas in the “List of 100 Coastal Historical Protected Areas Having Common Importance in the Mediterranean" selected pursuant to the Geneva Declaration dd. 13 September 1985 and published by the United Nations Environment Program,

iii) Coastal areas which are the habitat and feeding area of the "Endangered Marine Species Unique to the Mediterranean Sea" specified in Article 17 of the Geneva Declaration,

c) Cultural, natural, and historical areas defined as the “Cultural Heritage” and “Natural Heritage” and taken under protection by the Ministry of Culture pursuant to Articles 1 and 2 of the “Convention on the Protection of World Cultural and Natural Heritage” enacted by publication in the Official Gazette dd. 14 February 1983 No. 17959,

ç) The areas under protection pursuant to the RAMSAR Convention on Wetlands which was enacted by publication in the Official Gazette dd. 17 May 1994 No. 21937,

d) European Landscape Convention enacted by publication in the Official Gazette dd. 17 July 2003 No. 25181.

3. Areas Which Should Be Protected

a) Areas which have been determined in the existing approved environmental plans as areas whose existing characteristics shall be protected and for which a building ban is applied (areas whose natural characteristics are to be protected, bio-genetic reserve areas, geo-thermal areas, and similar),

b) Agricultural Areas: Agricultural development areas, irrigated and irrigable fields, areas where land use capability is Class I, II, III, and IV, class I and II areas which are used in precipitation dependent agriculture, and all special crop plantation areas,

c) Wetlands: areas which are natural or artificial, continuous or temporary, with stagnant or flowing water, fresh, brackish or salty water, with depths up to six meters in the tide recession period, having importance as a wetland habitat for living creatures especially for water birds,marsh, reed and turbary areas, and ecological wet lands from shore line to land side of these areas,

ç) Lakes, flowing waters, and ground water operation areas,

d) Habitat areas of species which are important for scientific research and / or endangered or might become endangered, or having endemic importance for our country; biosphere reserves, biotopes, bio-genetic reserve areas, and areas with unique geological and geomorphological formations.

Appendix 8-5

Site Observation Results
of
Yalova Hybrid Power Project

1. Outline of Site Observation

- Date: November 27, 2010
- Members

  EIE: Huseyin K., Mustafa D.

  JICA Study Ream: N. Seki, M. Ito, K. Nakamata, K. Kubota, N. Kosaka, J. Tamakawa
- Schedule

  6:00 – 11:00 Move from Ankara to Yalova

  11:00 – 11:30 Move from Yalova to Çınarcık

  11:30 – 12:30 (Lunch)

  12:30 – 13:00 Move from Çınarcık to Yalova HSPP Site

  13:00 – 15:00 Site Survey at HSPP Site

  15:00 – 21:00 Move from HSPP Site to Ankara

- Activities

  The Study Team carried out site observation at the Yalova PSPP Project Site. They checked topographical, geological and environmental conditions of the upper reservoir site, the lower dam and reservoir site.

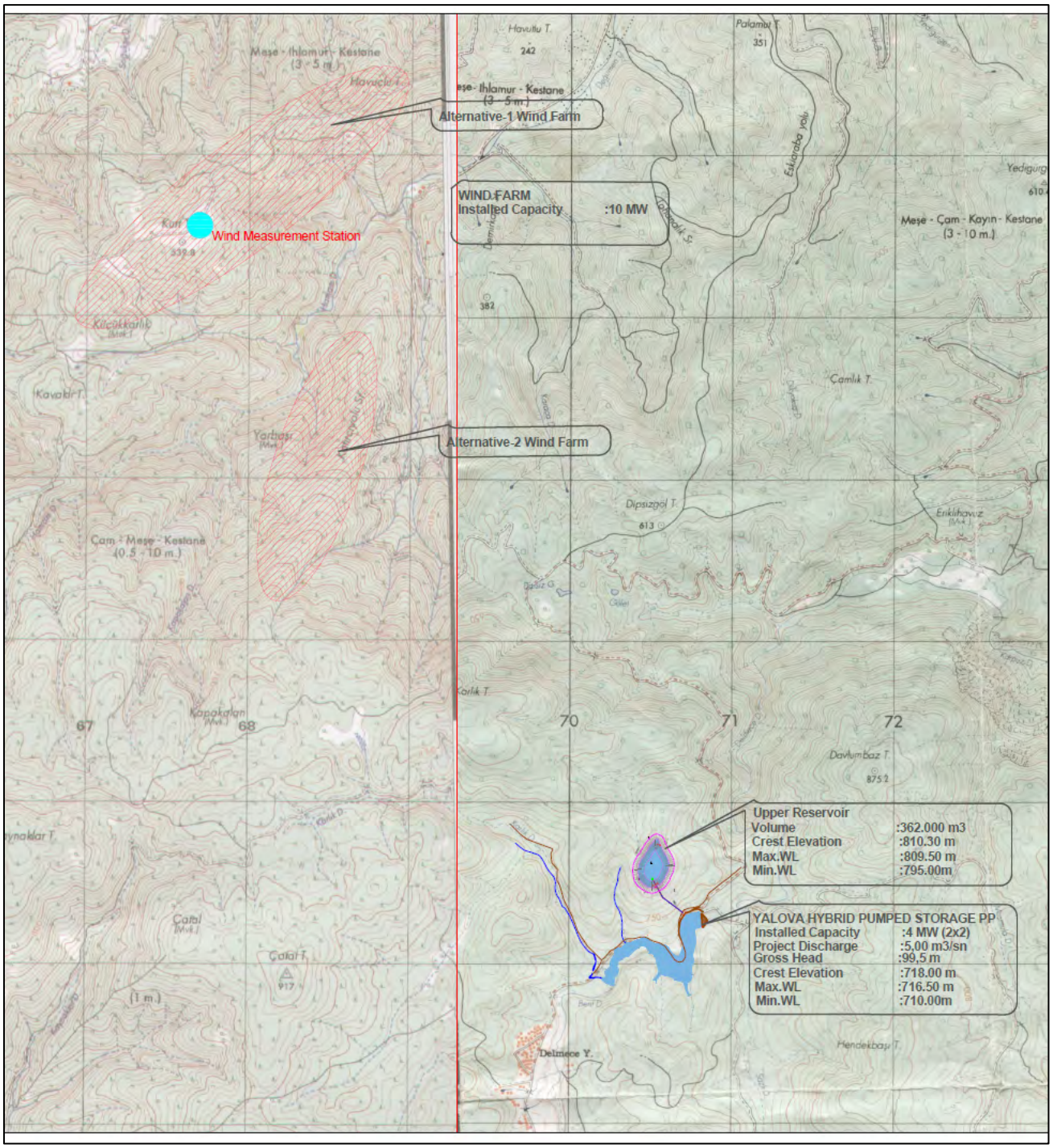
  Meanwhile, the Study Team could not visit the wind farm project site because the site was not accessible without four-wheel driving cars.

2. Outline of Yolova Hybrid Project

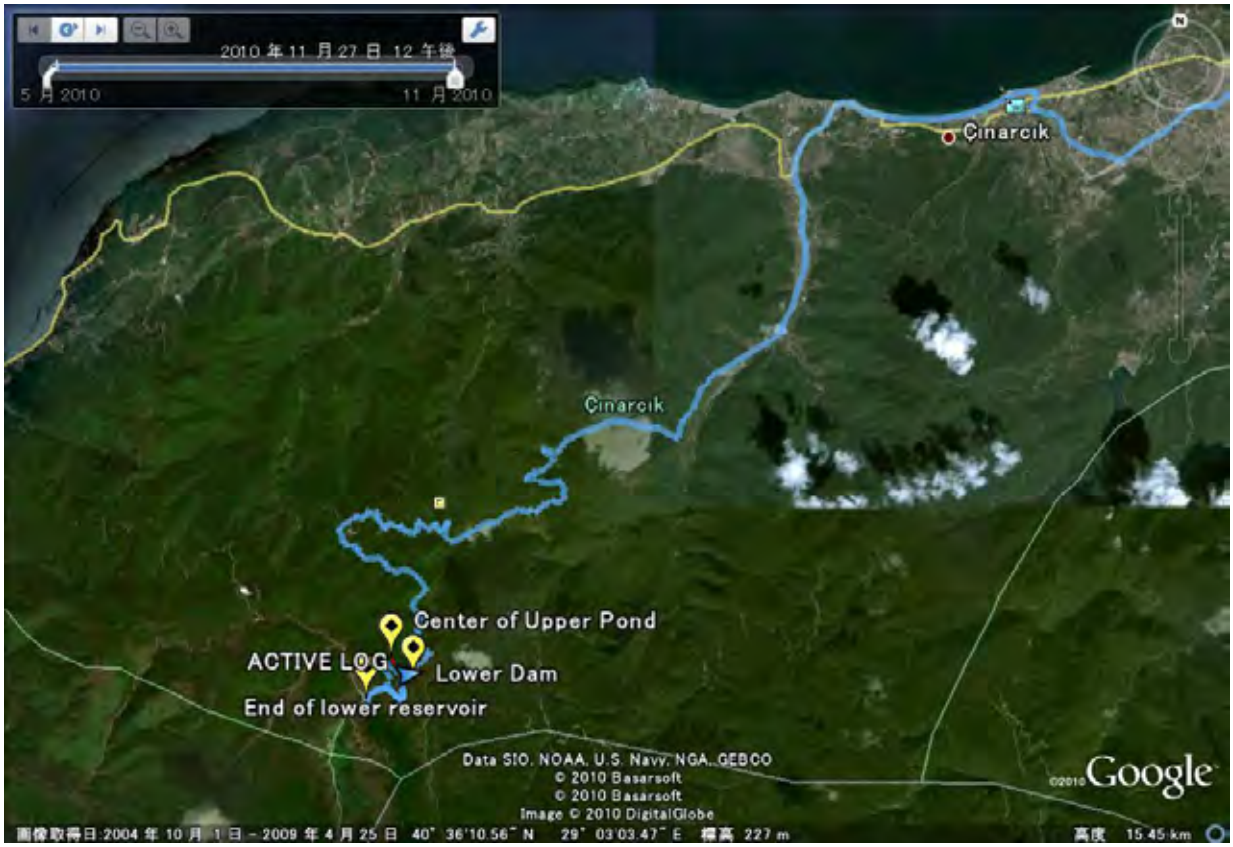
Location and Layout of YALOVA Hybrid Power Project are shown in the blow Table and Figure respectively.

Location of YALOVA Hybrid Power Project

1	Project Name	: **Yalova Hybrid PSPP**
2	City	: **Yalova**
3	Town	: **Çınarcık**
4	Map (1/25 000)	: **BURSA G21-c3 , BURSA G22-d4**
5	Upper Reservoir Coordination (6^0 UTM)	: **6 70 500- 44 93 700**
6	Power Plant Coordination (6^0 UTM)	: **6 70 800- 44 93 300**



Layout of YALOVA Hybrid Power Project



Track of Site Observation (Cited from Google Earth)

Track of Site Observation around PSPP (Cited from Google Earth)

	
Vegetation of PSPP Project Site	Site Survey at PSPP Project Site
	
Upper Reservoir Site	Outcrops along Way to Upper Reservoir Site
	
Outcrop along Access Road	Outcrop along Access Road (Precambrian)
	
Vegetation at the Lower Reservoir Site	Lower Dam Site (viewing upstream)

	
Lower Dam Site (viewing downstream)	Outcrop at Lower Dam Site
	
Signboard (Green Blue Road)	House at the end of Lower Reservoir
	
Situation at the end of Lower Reservoir	Road and Distribution Line to be relocated