

ENVIRONMENTAL NON-TECHNICAL SUMMARY FOR DOĞANÇAY WEIR AND HEPP

In order to utilize the hydroelectric potential of Doğan Stream, Ceylin Energy Production Co. has planned to invest in Doğançay Weir and HEPP project. EIA report prepared has been submitted to the Ministry of Environment and Forestry and EIA positive decision has been granted on August 25, 2009. The project has accepted a number of positive opinions from all the governmental agencies that participated in the EIA commission for Doğançay Project.

Project Site Characteristics:

The project area is on the Doğan Stream, a part of the Seyhan River Basin, in Aladağ District of Adana Province. The project area is under the responsibility of State Hydraulic Works (DSİ) Adana Region. The coordinates of the weir body is Y: 715864 X: 4159901 of M34-c3 map sheet of 1/25000 scale. The coordinates of the power house is Y: 722610 X: 4158892 of M35-d4 map sheet of 1/25000 scale.

The weir body is 4.6 km to the northeast of Aladağ District, the power house is 1.3 km north to the Gökçe Village, on the right bank of Seyhan River and downstream of Kavşak Bendi HEPP.

According to the Environmental Order Plan, close vicinity of the project area lie within marginal agricultural land, forestry land and Çatalan Dam Basin Protection Zone. The project area falls into the area marked as HES (hydroelectric power plant). There is no industrial development in the close vicinity and the area is termed as greenfield.

Doğançay Weir and HEPP project is within the boundaries of Seyhan River Basin and Çatalan Dam Long Distance Protection Zone (used for drinking water purpose).

There are no registered archeological or historical sites at the project site.

The site selection has been approved by all governmental parties participated in the EIA commission as stated in the approved EIA report and development consent has been granted.

Project Characteristics:

The Doğançay Weir and HEPP will have concrete gravity weir body, water intake structure, sedimentation pond, horseshoe type concrete energy tunnel (width: 3.40 m), power tunnel (diameter: 2.5 m, length: 564 m), and 3 vertical axis Pelton turbines in the power house totaling 49.17 MWm/46.23 MWe installed power. The construction is planned to last 31 months. Annual energy production will be 190.15 GWh.

The power generated will be transferred to the Kavşak Bendi HEPP switchyard by a 0.5 km long 154 kV ETL.

Number of workers during construction and operation will be 110 and 12, respectively. Locals will be given the priority for employment. Two camp sites will be established during construction, one near the weir body, the other near the power house.

Some of the excavated soil from earthworks during construction will be used in construction, road developments and access road construction and the leftover will be stored in the two storage areas determined.

Flora and Fauna Studies:

During the EIA process aquatic field studies were conducted to assess the current situation at the Project site. Twelve fish species were identified of which three are listed in the IUCN Red List, namely, *Salaria fluviatilis* (Least Concern-LC), *Alburnus orontis* (Endangered-EN) and *Squalius cephalus* (Least Concern-LC). The population densities of these species are quite high and the geographic distribution is wide. Construction of a fish ladder/passage was identified as a mitigation measure.

Terrestrial flora studies were also carried out during the EIA process. Of the 146 flora species identified and the project area, three (*Astragalus schizopterus*, *Micromeria cremnophila*, *Astragalus lyclus*) are termed as Least Concern-LC, one (*Verbascum antitauricum*) is termed as Vulnerable-VU and one (*Stachys pumila*) is termed as Near Threatened-NT. For VU and NT species, the EIA report recommends that the seeds are collected and stored in a gene bank for planting to similar habitats after construction.

As a result of terrestrial fauna studies, all four amphibian species identified were classified as LC according to IUCN Red List. Twelve reptilian species were identified and one (*Testudo graeca*) was classified as VU. A total of 57 bird species were identified and among them one (*Coracias garrulus*) was a NT category species and the rest 56 were LC category species. All eleven mammalian species identified were classified as LC according to IUCN Red List.

General mitigation measures for terrestrial fauna species were discussed in the approved EIA report.

Water Quality Studies:

A water sample taken from Doğan Stream was analyzed for parameters such as total suspended solids, BOD, COD, dissolved oxygen, total phosphate, nitrite, nitrate, sulphate and total nitrogen. The water quality of Doğan Stream was found to be Class III according to Water Pollution Control Regulation.

Environmental Flow Studies:

The environmental flow to be released from the Doğançay Weir and HEPP, excluding the rights for irrigation, drinking and potable water utilization and other utilization rights, is 1 m³/sec and 250 lt/sec for December-May and June-November, respectively. The average flows for the last 10 years are given in the table below:

Period	Average flow of the last 10 years (1999-2008)	Minimum water to be released for environment
December-May	9.07 m ³ /sec	1 m ³ /sec
June-November	2.28 m ³ /sec	250 lt/sec

The committed environmental flow values in the approved EIA report are above the 10% mean average flow of these periods.

A small reservoir will be formed by the weir having a height of 6.85 m. During impoundment, the minimum environmental flow determined above will also be released.

Public Participation and Disclosure:

A public participation meeting was held on April 21, 2009 in Aladağ as a part of the Turkish EIA procedure. The main questions raised by the locals of Aladağ, Gökçe and Kızıldam villages were related to employment and water resources.

After the EIA report was finalized, 10 work days for disclosure period was allowed. No public opinions or objections were received during disclosure period.

Mitigation Measures:

The EIA report approved has identified mitigation measures for reducing the degree of the impact of the Doğançay Project.

A portion of the required fill material will be met from the suitable excavated material; the rest will be purchased from the licensed quarry areas in the neighborhood. Similarly, the readymade concrete required for construction will be purchased from the operating concrete plants nearby.

It will be made sure that the works for excavation and construction will not cause any health and water quality problems.

During construction and operation, any discharge of wastewater and/or solid disposal to the streams and creeks feeding the Çatalan Dam basin is forbidden. Any activity changing the water regime and water quality is also forbidden.

Flood hydrology remarks and suggestions regarding flood will be followed as stated in the approved feasibility report of Doğançay Weir and HEPP.

The proper disposal of solid wastes and emissions formed during the construction of the weir, access roads and camp sites will be ensured so as not to impact reservoir quality.

After the construction is over, the camp site will be demolished and the land will be reinstated. In addition, unless the access roads are used as forest roads or village roads by the Adana Special Provincial Directorate, they will also be closed.

Activities causing industrial wastewater are forbidden within the project area. Waste oils and hazardous wastes originating from the project activities will be temporarily stored within the camp site in accordance with the relevant legislation. For the temporary storage, measures will be taken for impermeability. Mixing of waste oils and hazardous wastes with the river will be prevented.

In accordance with the article no 54 of the Regulation on Permits for Forestry Areas, Ceylin Energy will prepare 1/1000 scale zoning plan for the transformer station and power house area of the project and have it approved by the Adana Special Provincial Directorate. It will be made sure that

the existing infrastructure in the area (like roads, drinking water supply, sewerage) will not be damaged and if damaged, the loss will be covered by Ceylin Energy Co.

Before construction works, necessary permits will be obtained per Soil Protection and Land Use Law no 5403, Pastureland Law no 4342 and Water Products Law no 1380 and relevant articles will be pursued.

As the project area is within the Çatalan Dam Basin Protection Zone, official view of Adana Greater Municipality Water and Sewerage Administration General Directorate will be obtained before construction works. The pollution prohibition is valid for the protection zone; therefore, there will be no discharge of wastewater and no disposal of excavated material and solid waste during construction and operation. Water Pollution Control Regulation article 20 will be followed.

Environmental impacts and mitigation measures for construction and operation are as follows:

CONSTRUCTION PHASE		
Topic	Origin	Disposal
Domestic waste water	Personnel use	Package wastewater treatment plant will be installed. The treated wastewater will be collected in a septic tank and will be sent to the Kozan Municipality sewer system.
Domestic solid waste	Personnel use	Domestic solid waste will be stored in closed containers within the camp site and will be sent to the Aladağ Municipality solid waste disposal area.
Other wastes	Paper, iron, plastics etc.	These wastes will be collected separately and be delivered to the licensed disposal/reuse companies.
Dust emissions	Excavation works	Loading/unloading will be performed properly Water sprays will be used in dry-hot season Trucks will be covered for out of camp transportation
Vegetative soil	Vegetative soil will be strapped and stored separately	Stored vegetative soil will be used for landscaping purposes
Waste excavated soil	Leftovers of excavation works	The suitable portion of excavated soil will be used for construction works, road developments and filling activities. The leftovers will be stored in storage areas.
Waste oils	Waste oils of machinery maintenance and waste vegetative oil from food preparation	These wastes will be collected and be given to licensed companies per Waste Oil Control Regulation and Waste Vegetative Oil Control Regulation
Waste batteries	Heavy machinery	Waste batteries will be returned to the seller upon change.
Occupational health and safety during construction	Construction works	Works will be performed in accordance with relevant H&S regulations
Traffic load	Transportation	Speed limits will be obeyed. Traffic signs will be placed. Roads will be maintained as required.

OPERATION PHASE		
Topic	Origin	Disposal
Domestic wastewater	Personnel use	Impermeable septic tank will be constructed. The wastewaters will be taken by a vacuum truck to the Kozan Municipality sewer system.
Domestic solid waste	Personnel use	Domestic solid waste will be stored in closed containers within the camp site and will be sent to the Aladağ Municipality solid waste disposal area.
Environmental flow		For the continuity of the aquatic life after the weir body, 1 m ³ /sec and 0.25 m ³ /sec will be released for December-May and June-November, respectively
Fish passage		Fish passage will be constructed on the weir body