

TANNEX POWER GENERATION LIMITED

*Marungur Village, Panruti Taluk,
Cuddalore District, Tamil Nadu – 607 103*

Executive Summary of Environmental Impact Assessment and Environmental Management Plan for proposed 2 x 55 MW Coal Based Thermal Power Plant at Marungur Village

V R Enviro Engineers

No.2, Lingam Heritage, 7th Avenue, Ashok Nagar, Chennai – 600 083.

Tel: + 91 44 2474 1989

E-mail: vr_co2004@yahoo.co.in / vrenvirolab@gmail.com

EXECUTIVE SUMMARY

Introduction

The state of Tamil Nadu has an installed capacity of 12,375 MW (2007 figures) and is currently importing 700 MW from northern states of India to meet the energy requirement. The state faces a peak shortage of power to the extent of 8.6% of the total demand in the state. Due to anticipated addition of industries in the coming years, the demand for power is bound to increase further. The above scenario justifies installation of power plants in Tamil Nadu by private entrepreneurs.

Tannex Power Generation Limited (TPGL), Tamil Nadu is a closely held Public Limited Company. TPGL plans to capitalize on the peak and energy deficit situation that is likely to continue in our country. TPGL are planning to set up a Coal based Thermal Power Plant of capacity 2 x 55 MW . TPGL are planning to sell the power to industrial users and including trading licensees and / or to the State Electricity Board(s). The site is located at Kullanchavadi Road, Marungur Village, Panruti Taluk, Cuddalore District of Tamil Nadu.

Tannex Power Generation Limited (TPGL) approached State Level Expert Appraisal Committee for Environmental Clearance of their proposal. The State Level Expert Appraisal Committee (SEAC) issued the Terms of Reference (TOR) for conducting the EIA/EMP studies and Public Hearing as part of Environmental Clearance procedure. The present EIA and EMP report for Tannex Power Generation Limited has been prepared based on the TOR provided by SEIAA/ SEAC during the meeting held on 13th June 2008 through their letter no.SEAC/TN/F.No.78/1(d)/TOR-01/2008 dated 27.06.2008 and Generic Structure of Environmental Impact Assessment Document as per EIA Notification, 2006.

Project Description

Salient Features

- | | |
|--|---|
| Name of the company | : Tannex Power Generation Limited |
| • Project locations | : Marungur Village, Panruti Taluk, Cuddalore District, Tamilnadu-607 103 |
| • Type of plant | : Coal based Thermal Power Plant |
| • Capacity of the proposed power plant | : 2 x 55 MW |
| • No. of boilers to be installed | : Two (2) |
| • Capacity & type of each boiler | : 240 tons /hr, Circulating, Fluidized Bed Combustion boiler type |
| • Boiler outlet steam parameters | : 95kg /cm ² (a) 540 ± deg.C |
| • Fuels proposed for the boiler | : Indian coal (Grade `F') and/or Indonesian Coal |

- Annual fuel requirement : If entirely Indian Coal 0.760 mil. tons or
If entirely Indonesian Coal 0.600 mil. tons
- Source of water : From Bore wells located in the project area
- Make up water requirement : 32.5m³/hr.
- No. of turbo generators for installation: 2
- Type of tubogenerator : Straight condensing machine.
With uncontrolled extractions for feed heating
- Ratio Capacity / Performance : 963.60 million units
- Annual gross power generation : 867.24 million units
- Estimated power plant auxiliary : 104.07 million units
power Consumption
- Net send out power from power plant : 763.17 million units

Water Requirement

The make up water requirement for the power plant will be around 32.5m³/hr which will be drawn from Borewells established in the site.

Land Requirement

The total land requirement is estimated as 100 acres. A land area of about 60 acres for construction, 10 acres for Ash Pond (emergency requirement only) 20 acres for green belt development & balance 10 acres for future requirements. TPGL are already in possession of 100 acres of land.

Manpower Requirement

The Operation & Maintenance (O&M) will be planned in such a manner that the plant is operated and maintained in a safe and efficient manner and to comply with all the requirements of statutory bodies to their satisfaction. Operation group will be responsible for the safe and efficient operation of the plant as per the requirement of statutory bodies and as per the best code of practice for power plant. Requirement of manpower for Operation and Maintenance has been worked out as 140 persons, considering the various requirements of the Power Plant.

Power Evacuation

The 230 kV Transmission line from Villupuram to Cuddalore Substation is running at a distance of about 1.5 Km from the proposed power plant site. Required Loop-In and Loop-Out (LILO) arrangements will be made from the above transmission line for evacuation of the power generated from the proposed power plant.

Description of Environment

Micrometeorology

Prevailing micro-meteorological conditions at site regulate the dispersion (and hence dilution) of air pollutants in the atmosphere. Therefore, study of meteorological conditions is an integral part of environmental impact assessment studies. Accordingly, a meteorological station was set up at project site. The data were collected during May – July '08. Predominant wind was from Southwest quadrant. Wind velocity readings were ranging from < 1 to 19.4 Kmph. Temperature values were ranging from 24.0 °C to 39.9°C. The mean relative humidity value was found to be 66.40%. The mean atmospheric pressure was found to be 752 mm of Hg. A total rainfall of 11.14 cm was recorded during the study period.

Ambient Air Quality

At all location, the SPM and RPM values were ranging between 79 and 186 $\mu\text{g}/\text{m}^3$ and 20 and 69 $\mu\text{g}/\text{m}^3$ respectively. The SO_2 and NO_x values are ranging between 8.0 and 18.2 $\mu\text{g}/\text{m}^3$ and 12.2 and 42.7 $\mu\text{g}/\text{m}^3$ respectively. The CO and Ozone values were found to be below detectable limit.

Noise Levels

The Day and night time Noise levels were ranging from 50.9 dB(A) to 64.8 dB(A) and 40.8 dB(A) to 54.2 dB(A) respectively. It is observed that noise levels varied at different sampling stations. The noise levels are found to be within the prescribed limits.

Water Environment

Ground Water

At all locations, pH values were in the range of 6.14 – 7.58 with agreeable colour, taste and odour. Chloride and Sulphate values were in the range of 21 – 82 mg/l and 0 – 11 mg/l respectively. Hardness values were found to be in the range of 35 – 83 mg/l. Fluoride values were found to the maximum extent of 0.04 mg/l. At all locations, oil and grease, phenolic compounds, cyanides, sulphides and insecticides were found to be absent and all heavy metal except iron values were found to be below the detection limit. Iron value was found to be a maximum of 0.82 mg/l. The maximum total coliforms were found to be 8 MPN/100 ml. While comparing with IS: 10500 – 1991 norms, all values except total coliforms were found to be well within the limits.

Surface Water

As there are no major water bodies around the site, which may get significantly affected due to the project activities, only one representative sample was collected from the pond near Arasadikuppam. pH values were found to be 6.82. At this locations Oil & Grease, Phenols, Cyanides, Sulphides and Insecticides were not found and most of the heavy metals values were found to be below the detectable limits except Iron which was found to be 0.24 mg/l. Also good D.O. content at this location indicate that the natural restoration of water quality is maintained.

Land Environment

The soil samples were collected at project location and nearby areas. At all locations, pH ranges from 7.54 to 8.68. The sand content of the soil ranged between 60.0 and 70.0 %. Nitrogen, Potassium and Phosphorus are found to be in the range of 86 – 124 Kg/Ha, 105 – 170 Kg/Ha and 3.2 – 5.4 Kg/Ha respectively. Organic Carbon was found to be in the range of 0.9 – 1.4 %. Texture Class was found to be Sandy Loam.

Biological Environment

No endangered and endemic species (flora & fauna) recorded in the project site and its surroundings, hence conservation plan is not required.

Socio Economic Environment

The area within the first 10 km radius of the site falls mostly in Panruti Taluk. Majority of the people in the study area belong to Hindu religion. The study area also contains Scheduled Castes (SC) and Scheduled Tribes (ST).

Among the total population, 21% belonged to the scheduled castes (SC) and 0.18% belonged to the scheduled tribes (ST). The study area experiences a moderate literacy rate of 61.611%. The male literacy i.e. the percentage of literate males to the total males of the study area is observed as 71.0% while female literacy rate, which is an important indicator for social change, is observed as 52.0 % in the study area.

The occupational pattern in the study area shows that majority (57%) of the population in the villages belongs to the non-workers category, 11.0% is marginal workers, and the remaining 32.0% are main workers. About 36% of the main workers are engaged in agricultural labour and about 22% are cultivators. Thus more than three fourths of the population in the region is engaged in agriculture, which is the main occupation in the area. Each of the other categories of main workers represents less than 5.5% of the total main workers' population.

Amenities available in the villages considered in the Study Area have been collected from Census Book for the District. Educational facilities, Healthcare facilities, Water supply, Communication facilities, Banking facilities, Road and Transportation facilities, availability of news papers & magazines etc., are covered in these amenities.

It is noticed that villages have majority of all these facilities. Panruti Taluk has good facilities for education and 103 primary schools, 70 secondary schools and 9 senior secondary schools are available in the study area. The facilities for higher education are also available.. The nearest medical college is located at Pondicherry, Chidambaram, about 45 kms from the site.

The study area has potable drinking water mostly from Tube wells, hand pumps, tap water, and dug wells. The communication system of the region is moderately good. Kacha as well as Pucca roads connect all Taluks. Bus is the main mode of public transport, other than rail transport. Good post and telegraph services are available in the study area. Power supply is available in all villages of Panruti Taluk for all purposes.

Identification and Prediction of Impact

Impact Identification

| Actions | Raw material storage and handling, power production and other allied activities | | | | | | | | | | Post Operational Phase | |
|-----------------|---|-------------------|-------------------|--------------------------|---------------------------|-----------------|----------------------|----------------------------|------------------------|------------|----------------------------|----------------|
| | Construction Phase | Operational Phase | Material Handling | handlingCoal Storage and | waterWater drawl (Surface | Water discharge | Maintenance Workshop | Power generation by DG set | Green Belt development | Employment | Urbanization (Buffer zone) | Transportation |
| Ambient air | • | • | • | • | | | • | • | ⊙ | | • | • |
| Water resources | • | | | | • | | | | | | • | |
| Water quality | • | | | • | | • | • | | | | • | |
| Ambient Noise | • | • | • | | | | • | • | | | • | • |
| Flora & Fauna | • | ⊙ | | | | | | | ⊙ | | • | |
| Soil & Land use | • | ⊙ | | • | | • | | | ⊙ | | • | • |
| Infrastructure | • | ⊙ | ⊙ | | | | | | | | ⊙ | ⊙ |
| Health & Safety | • | | | • | | • | • | | ⊙ | | | |
| Socio-economics | | | | | | | | | ⊙ | ⊙ | ⊙ | ⊙ |
| Aesthetics | | | | | | | | | ⊙ | | ⊙ | |

- Adverse Impact
- ⊙ Beneficial Impact

Maximum Predicted Ground Level Concentration

| Pollutant | Max. Predicted concentration $\mu\text{g}/\text{Nm}^3$ | Background concentration $\mu\text{g}/\text{Nm}^3$ | Overall concentration $\mu\text{g}/\text{Nm}^3$ | Distance m | Direction | Regulatory Standards |
|-----------------|--|--|---|------------|-----------|----------------------|
| SO ₂ | 26.2 | 14.9 | 49.1 | 2000 | NE | 80 |
| NO _x | 12.2 | 30.1 | 42.3 | 2000 | NE | 80 |
| SPM | 4.8 | 156 | 160.8 | 2000 | NE | 200 |

Environmental Monitoring and cost for Environmental Protection

A monitoring strategy is required to ensure that all environmental resources which may be subject to contamination are kept under review and hence monitoring of the individual elements of the environment is necessary. The Environment Management Department (EMD) of TPGL will be entrusted with this responsibility. The officers of EMD will assess the progress and analyze the data periodically. The Environmental monitoring programme is explained in Chapter IV. The capital and recurring cost for pollution control/ environmental protection measures will be 49.95 and 1.3 crores respectively.

Risk Assessment

The objectives of risk assessment will be to identify the potential hazardous areas so that necessary design safety measures can be adopted to minimize the probability of

accidental events. The Emergency Plan also will be made to manage the emergency situation if any, from the plant operation.

The plant is not handling any toxic chemicals and coal and furnace oil are the only fuels used.

A study of the raw materials and power generation process brings out the fact that there will not be any impact over the surrounding arising out of any fire. The worst case scenario identified is based on failure of Furnace Oil Tank and consequent pool fire. The impact distance is limited to 23 metres from the Furnace Oil Storage Tank which is well within the plant area. The situation can be easily controlled with the fire protection system proposed.

Project Benefits

The implementation of 2 X 55 MW Power Plant will Support the state and the country although in a small way not only in mitigating high power demand but also mitigate the peak shortage of power. TPGL will undertake various community welfare measures for upliftment of surrounding villages like encouraging education, encouraging entrepreneurship among locals through vocational training, upgrading primary school facility and play grounds, construction of bus shelters, health camps and eye camps and improvement of facility in primary health centres in nearby villages.

Environmental Impact Statement

After collection of base line data, subsequent identification, prediction and evaluation of impact, EIS has been delineated for five basic environmental components viz air, water, noise, land, biological and socioeconomic impacts. Whilst, positive beneficial impact is anticipated on the socio economic, land and biological environment, there is no adverse impact over the other environment arising out of the proposed power plant operation.

Environmental Management Plan

In order to mitigate the impacts of the proposed plan, Environment Management Plan (EMP) is delineated for each environmental component. The EMP includes formulation, implementation and monitoring of environmental protection measures during and after commissioning of the proposed power plant.

The EMP is delineated to be dealt with in the Construction and operational phase. During Construction phase, the construction activities like site levelling, grading, transportation of the construction material do not any cause significant impact on the surroundings. The impact during the construction phase on the environment would be basically of transient nature and are expected to reduce gradually on completion of the construction activities.

The air pollution will be controlled by installation of ESP and bag filters. Effluents such as boiler blow down, auxiliary cooling water blow down and D.M. Plant neutralized re-generation waste would be collected in a central effluent holding basin. The effluent would be monitored properly to ensure compliance with the regulatory standards.

The effluent will be treated by RO plant and permeate will be reused. The rain water harvesting will be provided in the plant site for conservation of water.

Fly Ash & Bottom Ash will be sold to cement/brick manufacturers and would be used in road formation and filling of low lying areas. However, 10 acres of land has been exclusively earmarked for development of LDPE lined Ash Pond for emergency use only.

About 20 Acres of the total land area of TPGL is proposed to be developed with greenbelt. The tree density will be around 1500 per ha..

The occupational health and safety will be maintained among the workers by regular monitoring and periodical medical examination. The environmental management plan for the social upliftment of the nearby villages will be implemented. An Environmental Management Department will be developed with qualified personnel. The post-project monitoring will be carried out with approved Environmental Engineering Laboratories and the reports will regularly be forwarded to TNPCB / MoEF.