# 1.0 INTRODUCTION

**M/s. Lalitpur Power Generation Company Ltd. (LPGCL),** intends to set up a coal based 3x660 MW Thermal Power Plant near Mirchwara and Buraugaon villages in District Lalitpur in Uttar Pradesh.

This chapter describes the purpose of the report, identification of the proposed project and project proponent, brief description of nature, size and location of the project and importance to the region and country. This chapter also describes the scope of the study and details of regulatory scoping carried out as per Terms of Reference (TOR) issued by Ministry of Environment and Forests (MoEF), New Delhi.

## 1.1 Purpose of the Report

As per Environmental Impact Assessment EIA Notification dated 14th September, 2006, commissioning or operation of thermal power plants (≥500 MW) falls under category 'A' under project type 1(D) and requires Environmental Clearance (EC) to be obtained from MoEF before the commencement of ground activity.

Inline with the said Notification, MoEF has prescribed the TOR for the preparation of EIA/EMP report for the proposed coal based power project during the meeting held on 12.02.2010.

Based on the TOR conditions stipulated by MoEF vide letter No. **J-13012/118/2009-IA.II (T) dated 12th March 2010**, draft EIA/EMP has been prepared and made available to public for comments and concerns. The EIA/EMP draft report has been based on the TOR specified by MoEF. TOR is enclosed as **Annexure-I**.

## 1.2 Identification of Project and Project Proponent

### 1.2.1 About the Project

The proposed project (3X660 MW Coal Based Power Plant) will be located near Mirchwara and Buraugaon villages, Lalitpur district, Uttar Pradesh. This project is inline with the central government's massive power capacity addition plan, which sets a target of adding 78,700 MW of power generation capacity in the country in the 11th plan (2007-2012) out of which more than 15000 MW are expected to be met by the private sector. This proposed project at Lalitpur district by M/s **Lalitpur Power Generation Company Ltd.** would assist in meeting the increased demand of power.

It is envisaged to use coal for the power plant would be obtained from subsidiary of Coal India

### 1.2.2 Project Proponent

**M/s. Lalitpur Power Generation Company Ltd. (LPGCL),** intends to set up a coal based 3x660 MW Thermal Power Plant near Mirchwara and Buraugaon villages in District Lalitpur in Uttar Pradesh.

## 1.3 Brief Description of Project

The proposed project would require 1282.2-acre (≈519.1-ha) of land including the ash pond and green belt area. In the proposed power plant three (3) boilers with super critical technology will be installed which will be fired on coal. The total coal requirement for the project at 85% Plant Load Factor (PLF) 8.51 MTPA, which comprises of indigenous coal from Dudhichua, open coal mine of NCL and imported coal from Indonesia. The water requirement will be about 5556 $m^3$/hr, which will be drawn from Rajghat dam (Betwa canal system). One twin -flue stack and one single flue stack of 275-m with ESP of more than 99.9% efficiency will be provided to control particulate matter to below 50-mg/$Nm^3$.

### 1.3.1 Project Cost

The cost of the total project is about Rs.12295.8 crores, which includes Rs 1230 Crores for environmental protection measures. The project will be commissioned in 56 months.

### 1.3.2 Description of the Site

The land identified for the proposed project is about 1282.2acre (≈519.1-ha). The land in the plant site is plain land with a general elevation of about 330-m MSL.

The mean maximum and mean minimum ambient temperatures in the area as per IMD–Tikamgarh for the period of 10 years from 1991 to 2000 are recorded to be 41.8°C (May) and 13.6°C (March) respectively. The relative humidity varies from 35% to 55% at 0830 hr and from 22% to 31% at 1730 hr. The average annual total rainfall in the region is about 1057.1-mm. seismically, the site falls under Zone-II.

### 1.3.3 Environmental Setting of the Site

The environmental setting of the proposed plant site is given in **Table-1.1**. The location map of the project and study area map of 10-km radius around the proposed site are given in **Figure-1.1** and **Figure-1.2** respectively. The co-ordinates of the plant site and ash pond site are marked on topo-sheet and enclosed as **Figure-1.2**.

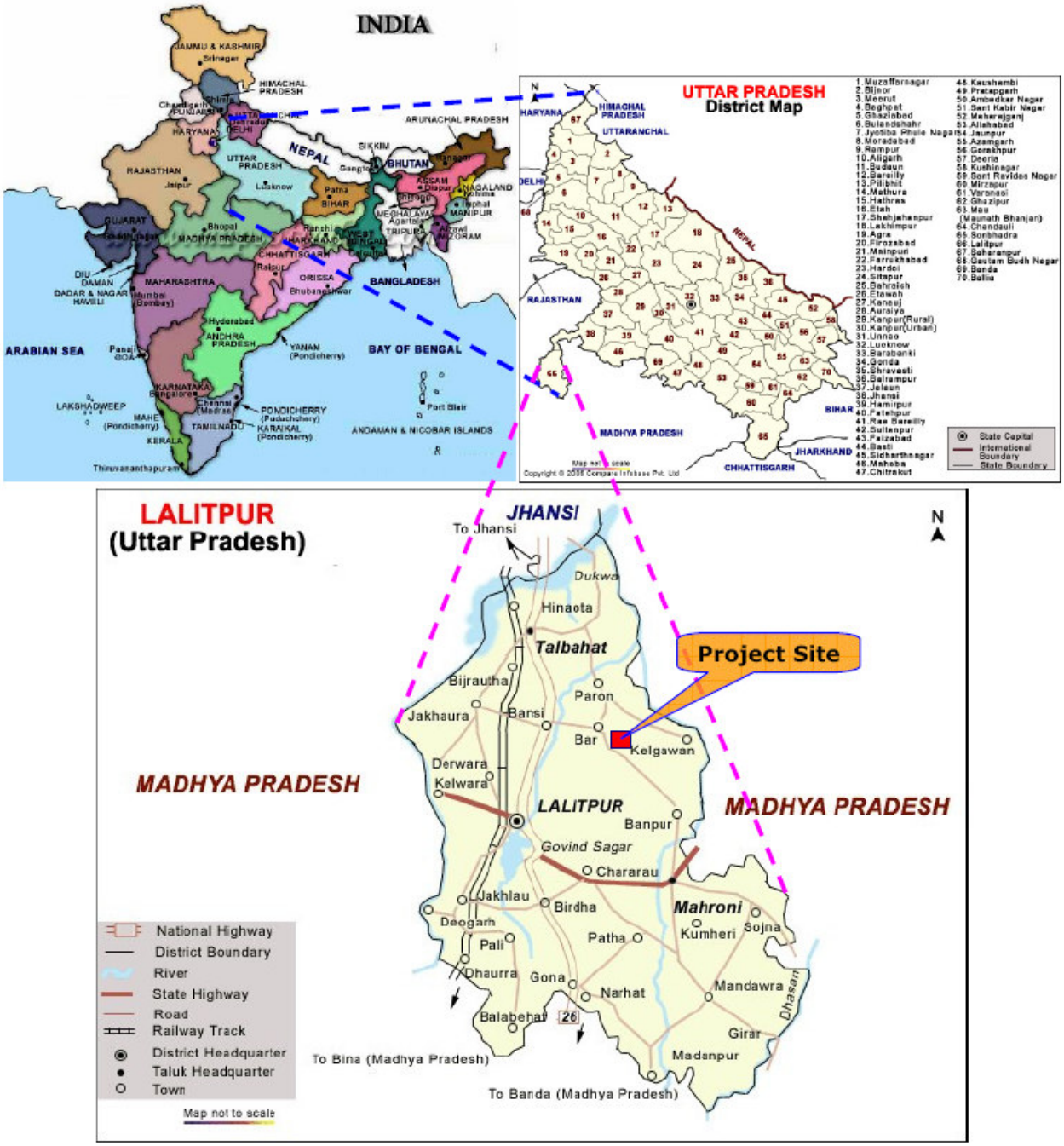


**FIGURE-1.1**
**LOCATION MAP OF THE PROPOSED POWER PLANT**

**FIGURE-1.2**
**STUDY AREA MAP (10 KM RADIUS)**

## TABLE-1.1
## ENVIRONMENTAL SETTING OF THE SITE

| Sr. No. | Particulars | Details |
|---|---|---|
| 1 | Plant Location | Michawara and Buraugaon villages of Lalitpur district, Uttar Pradesh |
| 2 | Plant site coordinates | **Coordinates**<br>**Corner Point** / **Latitude** / **Longitude**<br>A: 24º48'26" N, 78º38'01" E<br>B: 24º48'07" N, 78º39'33" E<br>C: 24º47'06" N, 78º39'38" E<br>D: 24º47'05" N, 78º38'58" E<br>E: 24º47'27" N, 78º38'05" E |
| 3 | Ash pond coordinates | **Coordinates**<br>**Corner Point** / **Latitude** / **Longitude**<br>1: 24º47'05" N, 78º38'58" E<br>2: 24º46'46" N, 78º38'59" E<br>3: 24º46'54" N, 78º39'15" E<br>4: 24º47'06" N, 78º39'38" E |
| 4 | Climatic Conditions (IMD, Tikamgarh) | |
| a) | Temperature<br>Mean maximum<br>Mean minimum | <br>41.8 ºC (May)<br>7.0ºC (January) |
| b) | Mean Annual Rainfall | 1057.1 mm |
| c) | Relative Humidity | 22 % - 87% |
| d) | Predominant wind directions | W, N followed by SW |
| 6 | Plant site Elevation above MSL | 330 -m above MSL |
| 7 | Plant site Toposheet | 54 L/9 |
| 8 | Present land use at the site | Mixed barren land with shrubs |
| 9 | Nearest highway | NH-26 (16-km, W) |
| 10 | Nearest railway station | Lalitpur (20-km, SW) |
| 11 | Nearest Airstrip | Lalitpur (20-km, SW) |
| 12 | Nearest major water bodies | - Sajnam nadi (1.6-km, W)<br>- Uttai nadi (0.5-km, E)<br>- Jamini nadi (9.8 km, E) |
| 13 | Water source for the project | Upstream of Betwa canal system |
| 14 | Nearest town/City | Lalitpur, (20-km, SW) |
| 15 | Nearest village | Mirchwara (1.0-km, SW) |
| 16 | Hills/valleys | -- |
| 17 | Archaeologically important places | Nil in 15-km radius |
| 18 | Protected areas as per Wildlife Protection Act,1972 (Tiger reserve, Elephant reserve, Biospheres, National parks, Wildlife sanctuaries, community reserves and conservation reserves) | Nil in 15-km radius |
| 19 | Reserved / Protected Forests | 17 forests exists around study area<br>- Tori RF (6.8-km, NW)<br>- Bar No.1 RF (8.5-km, NW)<br>- Bar No.2 RF (9.8-km, NNW)<br>- Maolen RF (11.4-km, N)<br>- Bara Pahar RF (12.6-km, NNE)<br>- Baroda Gang RF (12.0-km, NW)<br>- Barora PF (13.7-km, E) |

| Sr. No. | Particulars | Details |
|---|---|---|
| | | - Maughat PF (12.0-km, E)<br>- Banhaur Kharait RF (10.1-km, NNW)]<br>- Nayakhara PF (11.9-km, E)<br>- Ramnagar PF (12.2-km, ESE)<br>- Mirchwara RF (0.8-km, SE)<br>- Billa RF (4.8-km, S)<br>- Gangchari RF (7.0-km, S)<br>- Pah North RF ( 7.9-km, S)<br>- Kachnauda RF ( 6.3-km, SW)<br>- Pah East RF (10.5-km, SSE) |
| 20 | Seismicity | Seismic Zone-II as per IS 1893 (Part I): 2002 |
| 21 | Defence Installations | None in 15-km radius area |
| 22 | Major industries in 15-km radius | No major industries are present in 15-km radius |
| 23 | State Boundary | Madhya Pradesh State boundary, 9.9-km, NE |

***Note: All distances mentioned are aerial distances, Source: EIA studies, Vimta Labs Limited, Hyderabad***

## 1.4 Scope of the Study

With a view to assess the environmental impacts due to the proposed coal based power plant of 3X660 MW near Mirchwara and Buraugaon villages, M/s Lalitpur Power Generation Corporation (LPGCL) availed the services of ***M/s. Vimta Labs Ltd, Hyderabad*** to prepare EIA Report for various environmental components including air, noise, water, land and biological components along with parameters of human interest which may be affected and to prepare an EMP for mitigating adverse impacts.

The EIA report is prepared based on one season baseline environmental quality data as per the guidelines and requirements of MoEF, Central Pollution Control Board (CPCB) and Uttar Pradesh Pollution Control Board (UPPCB). Environmental baseline monitoring has been carried out during pre-monsoon season (15$^{th}$ March to 31$^{st}$ May 2010) and used to identify potential significant impacts. Modelling exercises have been carried out to predict and evaluate impacts due to proposed power plant. An Environment Management Plan is also delineated.

The scope of the present study is inline with the TOR as recommended by MoEF vide their letter no **J-13012/118/2009-IA.II(T) dated 12$^{th}$ March 2010.**

### 1.4.1 Study Area for EIA

The study area for the Environment Impact Assessment is 10-km radius area around the periphery of proposed power plant and ash pond area. The study area is shown in Figure-1.2.

### 1.4.2 Scope of the Study

The scope of the study broadly includes:

- Field sampling of environmental attributes at various representative locations in the study area to establish the baseline environmental status;
- Collate and compile secondary data including socio-economic data from published literature / government publications;

- Estimate pollution loads that would be generated by the proposed project;
- Predict incremental levels of pollutants in the study area due to the proposed project;
- Evaluate the predicted impacts on the various environmental attributes by using scientifically developed and widely accepted Environmental Impact Assessment Modelling Methodologies;
- Prepare an Environment Management Plan (EMP) to mitigate the predicted impacts; and
- Identify critical environmental attributes required to be monitored during the project execution and to suggest post project monitoring.

## 1.5 Compliance to TOR Conditions

**M/s Lalitpur Power Generation Corporation (LPGCL)** has presented the project details to MoEF Expert Appraisal Committee on 12th February 2010 to seek the Terms of Reference (TOR) for the preparation of EIA report. MoEF has examined the proposed TOR as submitted by LPGCL and recommended the TOR for preparation of EIA.

## 1.6 Methodology of the Study

Reconnaissance survey was conducted by M/s. Vimta Labs Limited, Hyderabad and officials of M/s Lalitpur Power Generation Corporation (LPGCL) and sampling locations were identified on the basis of:

- Predominant wind directions, expected during the period of baseline monitoring in the study area and also recorded by Indian Meteorological Department (IMD) at Tikamgarh;
- Topography and location of surface water bodies like ponds, canals and rivers;
- Location of villages/towns/sensitive areas;
- Identified pollution pockets, if any within the study area;
- Accessibility, power availability and security of monitoring equipment;
- Areas which represent baseline conditions; and
- Collection, collation and analysis of baseline data for various environmental attributes.

The monitoring details are outlined in **Table-1.2**.

**TABLE-1.2**
**DETAILS OF MONITORING**

| Sr. No. | Attribute | Parameters | Frequency of Monitoring |
|---|---|---|---|
| 1 | Ambient air quality | $PM_{2.5}$, $PM_{10}$, $SO_2$, $NO_x$ CO, Hg and $O_3$ | The monitoring was carried out at 8 locations and 24 hourly samples collected at a frequency of twice a week in Pre-monsoon season (2010). CO samples were collected on 8-hour basis of 3 samples per day for 3 months. |
| 2 | Meteorology | Wind Speed, Direction, Temperature, Relative Humidity, Rainfall & duration and other non instrumental observations | a] Continuous hourly recording through setting up of site meteorological station;<br><br>b] Data collected from secondary sources like IMD station, Tikamgarh. |
| 3 | Water quality | Physical, Chemical and Bacteriological Parameters | Once during the study period at 10 locations (for 7 ground water and 3 surface water ) |
| 4 | Ecology | Existing terrestrial and aquatic flora and fauna | Once during study period through field visits |
| 5 | Noise levels | Noise levels in dB(A) | Once during the study period at 8 locations |
| 6 | Soil characteristics | Soil profile, characteristics, soil type and texture, heavy metal, NKP value etc | Once during the study period at 8 locations |
| 7 | Land use | Land use for different categories | Based on data published in latest district census handbooks and satellite imagery |
| 8 | Socio-economic aspects | Socio-economic characteristics, labour force characteristics | Based on data published in latest district census handbooks |
| 9 | Geology | Geological history | Based on data collected from secondary sources |
| 10 | Hydrology (Surface and Ground) | Drainage area and pattern, nature of streams, aquifer characteristics, recharge and discharge areas | Based on data collected from secondary sources |
| 11 | Risk assessment, Disaster Management Plan and Occupational Health and Safety | Identify areas where disaster can occur and identify areas of occupational hazards. | Based on assessment |

## 1.7 Administrative and Legislative Background

The proposed power project is covered under several environmental legislations. Brief details of the applicable environmental standards are given in **Annexure-II**.

## 1.8 Compliance to TOR

Compliance to TOR conditions is given in **Table-1.3.**

**TABLE-1.3**
**TOR COMPLIANCE**

| Sr. No. | TOR Condition | Compliance |
|---|---|---|
| 1 | Conformity of the site with the prescribed guidelines in terms of distance of 500 m from HFL of the river, highways, railway line shall be shown on the study area map. | The environmental siting is given in Chapter-1 **(Table-1.1.)** |
| 2 | The coordinates of the proposed site including location of ash pond shall be submitted along with topo sheet. | The details of geographical co-ordinates are given in Chapter-1, **Table-1.1** and shown in **Figure-1.2.** |
| 3 | Proposed site shall avoid double crop agricultural land. Single crop agricultural land if unavoidable shall be used to the barest minimum. | The selected site does not have double crop agriculture land. The details of land break are provided in Chapter-2, **Table-2.3**. |
| 4 | Ash pond location shall be at least 500 m away from the national/state highway/ railway lines. Details shall be provided. | Confirmed |
| 5 | Detailed hydro-geological study shall be conducted from an institute/ organisation of repute to assess impact of on ground and surface water regime. Specific mitigation measures shall be spelt out and action plan for implementation of the same shall be provided. | The hydro-geological studies are in progress and will be completed after monsoon period. |
| 6 | Action plan for identification of local employable youth for training in skills relevant to the project for eventual employment in the project itself shall be formulated. | CSR details are provided in Chapter-8, **Section- 8.2.** |
| 7 | Layout plan indicating break-up of plant, green belt, infrastructure, roads etc. shall be provided. | Land break up is given in Chapter-2, **Table-2.2.** |
| 8 | Land use based on satellite imagery or authenticated map indicating drainage, cropping pattern, water bodies (rivers, nallahs, ponds etc.), location of nearest villages, creeks, rivers, reservoirs, national parks, wildlife sanctuaries, tiger reserves, biosphere reserves, heritage sites etc in the study area shall be provided. Location of any National Park, Sanctuary, Elephant/Tiger Reserve (existing as well as proposed), migratory routes, if any, within 10 km of the project site shall be specified and marked on the map duly authenticated by the Chief | Land use is given in Chapter-3, **Section-3.2.** |

| Sr. No. | TOR Condition | Compliance |
|---|---|---|
| | Wildlife Warden. | |
| 9 | Study on land-use pattern in the study area shall be carried out, including identification of common property resources available for conversion into productive land and action plan for abatement and compensation for damage to agricultural land/ common property land (if any) in the nearby villages, due to proposed project shall be prepared. | LULC details are provided in Chapter-3, **Section-3.2.** |
| 10 | Detailed socio-economic study shall be carried out for the study area comprising of 10 km from the plant site. | CSR details are provided in Chapter-8, **Section- 8.2.** |
| 11 | CSR component shall be prepared based on need based assessment study to be carried out in the study area. Income generating measures which can help in upliftment of poor section of society which is consistent with the traditional skills of the people shall be identified. The programme can include activities such as development of fodder farm, fruit bearing orchards, vocational training etc. In addition, vocational training for individuals shall be imparted so that poor section of society can take up self employment and jobs. Separate budget for community development activities and income generating programmes shall be specified. Financial allocation to be taken up under CSR shall be specified taking into consideration that the same shall not be less than 0.4% of capital cost of the project as one time investment for CSR activities and 1/5$^{th}$ of this one time investment as recurring cost per annum till the operation of the plant. | CSR details are provided in Chapter-8, **Section- 8.2.** |
| 12 | Possibility for adopting nearest three villages shall be explored and details of civic amenities such as roads, drinking water, power etc proposed be provided at the company's expenses shall be submitted. | This is covered under CSR. |
| 13 | Detailed study on the impact on river ecology due to the proposed discharge of treated wastewater into the river shall be carried out and submitted along with the EIA Report. | The waste water discharge is not envisaged. The details study on aquatic ecology are incorporated in Chapter-3, **Section-3.9** |
| 14 | Land requirement for the project shall be optimized. Item wise break up of land requirement and its availability to | The details are provided in Chapter-2, **Section- 2.4.1.** |

| Sr. No. | TOR Condition | Compliance |
|---|---|---|
| | be furnished. It should also include land to be acquired, if any, for coal transportation system as well as for lying of pipeline including ROW. It may clearly be confirmed that the land including ROW is free of all encumbrances. The issues relating to land acquisition and R&R should be clearly discussed in the EIA report. | Details of R & R issues are provided in Chapter-8, **Section-8.2.** |
| 15 | Location of intake and outfall points (with coordinates) should be given. These locations should be selected based on detailed modeling studies. Details of modeling and the results obtained there from should be furnished. | The water will be supplied from the intake point on up stream of Rajghat dam.<br><br>There is no discharge into the water source. |
| 16 | Topography of the area should be given clearly indicating whether the site requires any filling. If so, details of filling, quantity of fill material required, its source, transportation etc. should be given. | The site is plain and no filling is required. |
| 17 | One season site-specific meteorological data shall be provided. | One season meteorological data is provided in Chapter-3, Section-3.4.3 |
| 18 | One complete season AAQ data (except monsoon) to be given along with the dates of monitoring. The parameters to be covered shall include RSPM (PM10,PM2.5), $SO_2$, NOx, Hg and Ozone (ground level). The location of the monitoring stations should be so decided so as to take into consideration the pre-dominant downwind direction, population zone and sensitive receptors including reserved forests. There should be at least one monitoring station each in the upwind and in the pre dominant downwind direction at a location where maximum ground level concentration is likely to occur | Details are given in Chapter-3, Section- 3.5 |
| 19 | Detailed plan for raising Green belt of 100 m width and consisting of at least 3 tiers around plant boundary with tree density not less than 2500 trees per acre shall be submitted. | Details are given in chapter-4, **Section- 4.6.** |
| 20 | Impact of the project on the AAQ of the area. Details of the model used and the input data used for modelling should also be provided. The air quality contours may be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any. The wind | The details are given in Chapter-4, **Section-4.3.2.** |

| Sr. No. | TOR Condition | Compliance |
|---|---|---|
| | roses should also be shown on this map. | |
| 21 | Fuel analysis to be provided (sulphur, ash content and heavy metals including Pb, Cr, As and Hg). Details of auxiliary fuel, if any including its quantity, quality, storage etc should also be given. | The fuel characterization is given in Chapter-2, **Section – 2.4.2.** |
| 22 | Quantity of fuel required its source and transportation. A confirmed fuel linkage should be provided. | 8.51 MTPA with ash content not exceeding 35% will be utilized and sourced from subsidiary of Coal India. Coal linkage is under process. |
| 23 | Source of water and its availability. Commitment regarding availability of requisite quantity of water from the competent authority shall be provided. | The 5556 $m^3$/hr water will be sourced from Rajghat dam (Betwa canal) |
| 24 | Details of rainwater harvesting and proposed utilisation in the plant shall be provided. | Details are provided in Chapter-4, Section-4.5.3 |
| 25 | Feasibility of zero discharge shall be examined and detailed justification shall be submitted if in case the same is not possible. Proposed discharge (if any), its quantity, quality and point of discharge, users downstream etc. shall be provided. | Details in Chapter-4 |
| 26 | Optimization of COC for water conservation. Other water conservation measures proposed in the project should also be given. Quantity of water requirement for the project should be optimized. | The cooling towers are designed considering 6 COC. |
| 27 | Details of water balance taking into account reuse and re-circulation of effluents. | Water balance details are provided in Chapter-2, **Section- 2.4.3.** |
| 28 | Detailed plan of ash utilization / management shall be provided including examination for setting up of cement grinding unit / brick kiln etc. or provide adequate justification if otherwise. | Ash management plan was given in Chatper-4, **Section-4.5.5.** |
| 29 | Details of evacuation of ash shall be provided including details of HCSD system. | Details of evacuation of ash are provided in Chapter-2, **Section-2.5.10** and **2.5.11**. |
| 30 | Details action plan for arresting leachate in ash pond and details of lining proposed for making impermeable the bottom and sides of ash pond including soil analysis report and shall be submitted. | The HCSD system is proposed in disposal of ash. The ash pond of 102 acres will be lined with HDPE to prevent lechate. |
| 31 | Details regarding infrastructure facilities such as sanitation, fuel, restroom, medical facilities, safety during construction phase etc. to be | Details are provided in Chatper-2, **Section- 2.8** |

| Sr. No. | TOR Condition | Compliance |
|---|---|---|
| | provided to the labour force during construction as well as to the casual workers including truck drivers during operation phase. | |
| 32 | Impact of the project on local infrastructure of the area such as road network and whether any additional infrastructure would need to be constructed and the agency responsible for the same with time frame. | Roads will be strengthened and details of local infrastructure are provided in **Chapter-8**. |
| 33 | EMP to mitigate the adverse impacts due to the project along with item wise cost of its implementation. | Anticipated impacts and mitigation measures are detailed in **Chapter-4.** |
| 34 | Risk assessment including fire and explosion issues due to storage and use of fuel should be carried out. It should take into account the maximum inventory of storage at site at any point in time. The risk contours should be plotted on the plant layout map clearly showing which of the proposed activities would be affected in case of an accident taking place. Based on the same, proposed safeguard measures should be provided. Measures to guard against fire hazards should also be provided. | Risk assessment details and disaster management plan are given in **Chapter-7.** |
| 35 | Details of litigation pending or otherwise with respect to project in any courts, tribunal etc. shall be provided | Nil |