

### **Proposed Terms of Reference for EIA Studies**

|                          |   |
|--------------------------|---|
| <b>Project</b>           | Expansion of Kawai Thermal Power Plant from 1320 MW (2x660 MW) to 2920 MW, by addition of 1600 MW (2x800 MW) Coal based Thermal Power Project |
| <b>Category</b>          | <b>A</b> [1(d) Thermal Power Plant $\geq$ 500 MW]   |
| <b>Project Proponent</b> | <b>Adani Power Rajasthan Limited</b>  |
| <b>Location</b>          | Proposed power station is near Kawai Village in Atru Tehsil, Baran District. The site is about 110 km from Kota City in Rajasthan.            |

### **INTRODUCTION**

Adani Power Rajasthan Limited (APRL) has developed 1320 (2x660) MW Kawai Thermal Power Plant in Baran District, Rajasthan. The company has now proposed for expansion of Kawai Thermal Power Plant from 1320 MW (2x660 MW) to 2920 MW, by addition of 1600 MW (2x800 MW) Coal based Thermal Power Project. The project is being taken up to meet power requirements of the state of Rajasthan.

The expansion project would require about 7.14 million metric tonnes per annum @ 90% PLF (GCV-3800 Kcal/Kg, SHR – 2150 Kcal/kwh). APRL is in the process of applying for domestic coal linkage to the Ministry of Coal. About 15,000 KL per annum HFO/LDO/HSD would be require as Support Fuel from nearest refinery/oil depots. The coal from the coal stockyard will be transported through conveyor system.

APRL has been allotted 34 MCM/Year of water from Parwan River. Presently, the existing 1320 MW consume about 25 MCM/Year of water. The station has a surplus availability of 9 MCM/Year of water. The expansion project would require water 29 MCM per annum, for which APRL is making an application to the Water Resource Department, Government of Rajasthan for additional allocation of 20 MCM/Year of water from Parwan River.

The power generated from the project shall be supplied to the state of Rajasthan. The provisions for Power evacuation as considered presently shall be reviewed based on the finalized Associated Transmission System (ATS) of the project.

### **EIA METHODOLOGY**

The EIA Report will address all the terms of reference and will be prepared in accordance to the Environment Protection Act 1986 and EIA Notification published by Ministry of Environment and Forests, Govt. of India on 14<sup>th</sup> September 2006 and subsequent amendments. It will form part of the application to the Statutory Authority. The scope of the EIA Report for the proposed Power Plant includes identifying relevant environmental concerns and focus on potential impacts that may have changed due to the setting up of the plant. The report will also provide an Environment Management Plan and Disaster Management Plan.

The Post-Monsoon Season, 2014 (September- November, 2014) baseline monitoring will be carried out as per the requirement of MoEF.

## **SITE & STUDY AREA**

The site of the Thermal Power Project is about 110 km from Kota City, Rajasthan. The Site is well connected by National Highway no 90. Nearest Water source is Parwan river, for availability of Water. Parwan Irrigation Project is already under development by the state government.

Nearest Railway Station is Salpura, which is approx 2 km from site. Nearest Airport is Kota which is approx 110 km from site and Nearest Port is Kandla Port which is approx 940 km from site.

The existing Kawai Thermal Power Plant has been developed over an area of 350 ha, including Ash Dyke and Green Belt, out of the total land allotment of 578.53 ha by the Rajasthan. 228.53 ha land for the proposed expansion is already under the possession of Adani Power Rajasthan Limited. There is a space provided in the layout for future expansion by addition of 2 more units. The Project site is not located in an environmentally fragile area.

## **PROJECT DESCRIPTION**

### **Project Rationale**

This section will highlight the goals and objectives of the proposed project. It will also include discussion on the significance of the project in terms of the need for the project in the local as well as the national level it will also highlight the proposed project in line with existing development plans of the State and Central government and in accordance with the existing or envisioned land use plans.

### **Project Location**

This section will discuss the geographic location of the project. The location of the project will clearly define geographical features (e.g. watersheds, national parks / protected areas, military reservations, etc.) and the general access to the project site (e.g. presence of existing road networks, feeder roads, etc.).

### **Project Information / Process Information**

This portion will include the following

- Statement of the Official name of the project and name/s of proponents (including address, telephone nos., etc.) responsible / liable;
- Vicinity Plan, Processes involved, Site layout, water balance diagram
- Project cost and area
- Resource / Manpower requirements
- Time frame for project implementation

### **Process Description**

The technology to be used for the project and the process components of the project focusing on the materials input and output from the process components including products, fuels, feedstock and utility requirements (gas, electricity, steam and cooling water will be provided. Material balances (also energy balance); flow diagrams and descriptions of the process to be used will also be provided. The process emissions including air, liquid, and associated wastes, and associated pollution abatement equipment will be discussed.

### **Pre-Construction**

This section shall discuss / describe the various components of the projects. This section shall also discuss the major activities to be undertaken during the construction phase, which shall include but not be limited to:

- Site mobilization
- Road construction / improvement
- Camp construction
- Site clearing
- Construction of the major facilities / project components
- Construction of support services e.g. Water & Power supply & Telecommunications, etc.

### **Operation**

This section shall discuss the activities to be undertaken during the operation, which shall include but not limited to:

- Major maintenance activities
- Manpower requirements
- Fuel Requirement
- Energy requirements

## **BASELINE ENVIRONMENTAL SCENARIO**

Description of the existing environment, assessment of historical trends of environmental data specific to the proposed site and description of the socio-economic setting in the area will provide an overall picture of the proposed site before any development activities are undertaken. Thus, equipped with the knowledge of the existing environment and aware of the specifications of the proposed project as described in the preceding sections will be identified and areas of critical importance and impacts of the project can be reliably predicted.

Finally, methodologies used in the data collection (primary data) shall be briefly discussed with the corresponding interpretation of the data obtained. Likewise, all sources of information (secondary data) shall be identified and appropriately acknowledged.

| STUDY MODULES                  | SCOPE AND COVERAGE  | METHODOLOGY (TYPE AND SOURCE)   | MAPS/TABLES/ FIGURES REQUIRED  |
|--------------------------------|---|---|--|
| <b>A. PHYSICAL ENVIRONMENT</b> |   |   |  |
| Inland Topography              | <ul style="list-style-type: none"> <li>Landform Pattern</li> </ul>  | <ul style="list-style-type: none"> <li>Slope and elevation</li> </ul>   | <ul style="list-style-type: none"> <li>Topographic map</li> </ul>  |
| Soils                          | <ul style="list-style-type: none"> <li>Soil physical and chemical characteristics / analysis</li> </ul>   | <ul style="list-style-type: none"> <li>Soil survey</li> </ul>   | <ul style="list-style-type: none"> <li>Soil Sampling Locations</li> <li>Will be monitored on 8 location including site and ash pond area</li> </ul>  |
| Hydrology                      | <ul style="list-style-type: none"> <li>Surface water characteristics, river systems</li> <li>Groundwater characteristics</li> <li>Drainage systems</li> </ul>   | <ul style="list-style-type: none"> <li>Groundwater analysis</li> <li>Characterization of inland surface water</li> </ul>    | <ul style="list-style-type: none"> <li>Water supply and demand projections</li> </ul>  |
| Meteorology/ climatology       | <ul style="list-style-type: none"> <li>Rainfall pattern</li> <li>Frequency distribution of wind direction</li> <li>Temperature</li> <li>Associated atmospheric pressure</li> </ul>  | <ul style="list-style-type: none"> <li>Secondary data from IMD</li> <li>Primary data collection</li> </ul>                  | <ul style="list-style-type: none"> <li>Wind rose diagrams</li> </ul>   |
| Air Quality                    | <ul style="list-style-type: none"> <li>Ambient air quality</li> <li>SPM, RSPM, NO<sub>x</sub>, SO<sub>2</sub>, Mercury and Ozone</li> </ul>   | <ul style="list-style-type: none"> <li>Air quality measurements</li> <li>Identification of air pollution sources</li> </ul> | <ul style="list-style-type: none"> <li>Sampling station map</li> <li>Result of air quality measurements</li> <li>Ambient Air Quality will be monitored on 10 location including site.</li> </ul>                           |
| Water Quality                  | <ul style="list-style-type: none"> <li>Physico-chemical characteristics of surface waters and ground water (pH, TSS, DO, BOD, temperature, nitrates, phosphates, and metallic components etc.)</li> <li>Bacteriological characteristics (total coliform)</li> </ul> | <ul style="list-style-type: none"> <li>Sampling and analysis</li> </ul>   | <ul style="list-style-type: none"> <li>Sampling station map</li> <li>Results of laboratory analysis.</li> <li>5 surface and 5 ground water samples will be collected to assess the water quality of the region.</li> </ul> |

| STUDY MODULES                                 | SCOPE AND COVERAGE   | METHODOLOGY (TYPE AND SOURCE)   | MAPS/TABLES/ FIGURES REQUIRED  |
|---|--|---|--|
| Noise Level                                   | <ul style="list-style-type: none"> <li>Ambient noise levels at the project sites and nearby community</li> </ul>   | <ul style="list-style-type: none"> <li>Noise quality measurements</li> </ul>                                      | <ul style="list-style-type: none"> <li>Results of noise level measurements</li> <li>Sampling stations map</li> <li>Will be monitored on 10 location including site and nearby highways.</li> </ul> |
| <b>B. BIOLOGICAL ENVIRONMENT</b>              |  |   |  |
| Flora   | <ul style="list-style-type: none"> <li>Summary of vegetative cover</li> </ul>  | <ul style="list-style-type: none"> <li>Secondary data collection from region forest office</li> </ul>             | <ul style="list-style-type: none"> <li>Flora species inventory</li> </ul>  |
| Fauna   | <ul style="list-style-type: none"> <li>Terrestrial fauna including endangered and threatened fauna species</li> <li>Fauna species inventory survey</li> </ul>  | <ul style="list-style-type: none"> <li>Secondary data collection from region forest office</li> </ul>             | <ul style="list-style-type: none"> <li>Fauna species inventory</li> </ul>  |
| <b>C. SOCIO-ECONOMIC CULTURAL ENVIRONMENT</b> |  |   |  |
| Demography                                    | <ul style="list-style-type: none"> <li>Population size</li> <li>Population density, household size</li> <li>Population by gender</li> <li>Literacy rate</li> <li>Occupation and employment status</li> </ul> | <ul style="list-style-type: none"> <li>Principal data from Census</li> </ul>                                      | <ul style="list-style-type: none"> <li>Primary Census Abstract</li> </ul>  |
| Other Social Services                         | <ul style="list-style-type: none"> <li>School facilities</li> <li>Telecommunications, water and power facilities</li> </ul>  | <ul style="list-style-type: none"> <li>Principal data from Census</li> </ul>                                      | <ul style="list-style-type: none"> <li>Village Infrastructure directory</li> </ul>   |
| Transportation                                | <ul style="list-style-type: none"> <li>Network and mode of transportation</li> </ul>   | <ul style="list-style-type: none"> <li>Identification of main and access roads, mode of transportation</li> </ul> | <ul style="list-style-type: none"> <li>Road access map</li> </ul>  |

## ASSESSMENT OF ENVIRONMENTAL IMPACTS

There shall be an assessment on feasibility and cost-effective measures to prevent or reduce significant negative environmental impacts identified, to an acceptable level. In this section, the following aspects will be assessed:

- The project component and development activities that result in discharges to the environment and the effect of these on the environment
- Existing conditions in the site area, including existing land-use, resources and other activities, which in combination with the project activity have potential to affect the environment.
- Anticipated environmental effects

This chapter will include appropriate tables and figures to illustrate and summarize the key Information that is relevant in understanding the environmental and socio-economic environment. The environmental and socio-economic impact of the proposed project having regard for regional and cumulative effects will be presented. Wherever possible, the impacts will be quantified. This section will also include measures to address emergency response requirements for accidental events and also estimate costs of those measures and of the institutional training requirements to implement them.

The existing air quality of the region and the impact of the proposed project on regional air quality will be discussed. The component of the project, which will affect **air quality**, will be identified. All emissions as a result of the proposed projects and their effects on the environment will be discussed. Also the ways and means of reducing the air emissions impact will be discussed.

The project activities that will affect **surface water and ground water** will be identified. In this section, the water intake requirements during construction, operation and emergency situations will be estimated and the sources will be identified also. Any water minimization considerations will be included. The method of plant cooling and the design parameters and criteria for any incremental water management and storage facilities will be provided. The quantity and source of wastewater will be presented including a summary of water quality effects and possibility of recycling.

Project activities during construction and operation phases that will affect **noise levels** and the potential for increased noise resulting from this project will be presented. The effect on noise levels during the construction and operation phase will be ascertained.

Future **waste management** projections, storage and disposal plans and locations will be discussed. The quantity and composition of any waste including solid and hazardous wastes produced will be estimated and classified.

**Land-use and Socio-economic information** will also be provided. The impact on the resources and the present population will be highlighted. This will include the effects on employment, livelihood, economy and infrastructure.

| RESOURCE/<br>ENVIRONMENT | CONSTRUCTION PHASE | OPERATION / MAINTENANCE<br>PHASE |
|--------------------------|--------------------|----------------------------------|
|--------------------------|--------------------|----------------------------------|

|                                     | IMPACT  | IMPACT  |
|-------------------------------------|---|---|
| Land                                | <ul style="list-style-type: none"> <li>• Modification of land forms</li> </ul>  | <ul style="list-style-type: none"> <li>• Change in present form</li> </ul>  |
| Water                               | <ul style="list-style-type: none"> <li>• Change in quality of surface and groundwater</li> </ul>                                | <ul style="list-style-type: none"> <li>• Change in quality of water bodies due to discharge of effluent</li> </ul>                    |
| Air Quality                         | <ul style="list-style-type: none"> <li>• Dust generation</li> <li>• Change in concentration of pollutant gases</li> </ul>       | <ul style="list-style-type: none"> <li>• Change in level of gaseous pollutants i.e. TSP, SO<sub>2</sub> and NO<sub>x</sub></li> </ul> |
| Noise                               | <ul style="list-style-type: none"> <li>• Change in noise level</li> </ul>   | <ul style="list-style-type: none"> <li>• Change in noise level from various sources</li> </ul>  |
| Wastewater / Solid waste management | <ul style="list-style-type: none"> <li>• Wastewater / Solid waste management</li> </ul>   | <ul style="list-style-type: none"> <li>• Solid waste management</li> <li>• Wastewater management</li> </ul>                           |
| Socio-economic                      | <ul style="list-style-type: none"> <li>• Change in employment pattern</li> <li>• Change in Infrastructure facilities</li> </ul> | <ul style="list-style-type: none"> <li>• Change in economy of the region</li> <li>• Employment benefits</li> </ul>                    |

## ENVIRONMENTAL MANAGEMENT PLAN

### Monitoring Program

The EIA shall contain an extensive monitoring program for parameters included in the baseline studies. An Environmental Monitoring Plan containing the following information would serve as a guide in the monitoring activities.

- Frequency of sampling and sampling points
- Sampling parameters: groundwater quality, water quality of the surrounding bodies of water (e.g. BOD TSS, Oil and Grease, etc.).
- Sampling should be done at the same locations as in the baseline data survey and at effluent release points to check whether permissible requirements are met.
- Work and financial plan for the current year

### Information, Education and Communication (IEC) Plan

Plans for Informing, educating and communicating with the State Government and the community regarding the project and its implementation of the EMP should be presented.

### Contingency / Emergency Response Plan

Procedures on how to cope with emergencies / accidents shall be outlined in a comprehensive contingency / emergency response plan. The institutional responsibilities will be made clear and the flow of communication in cases of emergencies will be included.