

**PROCEEDINGS OF THE MEETING OF STATE LEVEL EXPERT APPRAISAL  
COMMITTEE, ODISHA HELD ON 29<sup>TH</sup> SEPTEMBER, 2018**

---

The SEAC met on 29<sup>th</sup> September, 2018 at 11:00 AM in the Conference Hall of Odisha State Pollution Control Board, Bhubaneswar under the Chairmanship of Dr. B.K. Patnaik. The following members were present in the meeting.

1. Dr. B. K. Patnaik	-	Chairman
2. Sri B.P. Singh	-	Member
3. Dr. D. K. Rout	-	Member
4. Sri B.C. Prusty	-	Member
5. Dr. S. C. Nayak	-	Member
6. Dr. R.C Mohanty	-	Member
7. Sri A. C. Mohanty	-	Member
8. Dr. S.K. Biswal	-	Member
9. Sri S. Behera	-	Member

The agenda-wise proceedings and recommendations of the committee are detailed below:

**ITEM NO. 01:**

**PROPOSAL FOR ENVIRONMENTAL CLEARANCE FOR CONSTRUCTION OF LPG BULK STORAGE (1800 MT) & BOTTLING FACILITY (INDANE BOTTLING PLANT) AT PLOT NO. 708 AND 707 (P) AT - SOMANATHPUR; DIST- KHORDHA, ODISHA OF M/S INDIAN OIL CORPORATION LIMITED (EC).**

1. This is a proposal for Environmental Clearance for setting up LPG Bulk storage and Bottling Plant at Khordha, Odisha with installation of 3X600MT mounded storage bullets for storage of LPG with bottling capacity of 60 TMTPA. Total Cost of project is ₹ 161.59 Crore.
2. The proposed LPG plant is located at Plot No 701,703,704,706, 707(P) & 708 (P) at Mouza: Somanathpur of Khordha district, Odisha. Coordinates are A - 20° 7'56.99"N 85°34'19.87"E ; B - 20° 8'1.68"N 85°34'23.63"E ; C - 20° 8'0.94"N 85°34'25.44"E ; D - 20° 8'3.09"N 85°34'27.13"E ; E- 20° 7'58.78"N 85°34'34.80"E ;F- 20° 7'51.92"N 85°34'28.32"E.
3. Total Land Area for the project is 32 Acres and the land has been purchased from Shree Jagannath Temple Trust, Puri.
4. Nearest railway station : Khurda Road Railway Station: 18km(NE) ; Nearest highways- NH 5 – 1.3 km (ES) ; Nearest Airport-Biju Patnaik International Airport: 35km(NE) ; Nearest town-Khordha Town-10 (NE)
5. This project falls under Category "B", Project or Activity 6(b) as per EIA Notification dated 14th Sept., 2006 & its subsequent amendments.
6. Water Requirement is 15 m<sup>3</sup>/day including domestic requirement, fire fighting and gardening. The source of Water is Bore wells.
7. The unit will generate domestic waste water of quantity 6.5 KLD, which will be treated in 2 nos. of STP of capacity 10 KL each. Industrial Waste water of quantity 4 KL will

be generated, which will be treated in ETP of capacity 5 KL. Treated water will be used for gardening. Zero Liquid Discharge (ZLD) Concept will be adopted.

8. Total Power requirement is 400 KW. The source of Power is Central Electricity Supply Utility, Odisha. DG Sets of capacities 1 x 250 kVA and 1 x 700 kVA will be installed for Back-up Power. The industry will use Solar Power in Admin building, street lights etc.
9. No industrial solid waste will be generated during the storage & bottling process. Damaged cylinders will be segregated & stored on site prior to disposal as scrap metal. Hazardous waste such as used oil generated from D.G set operation will be disposed to OSPCB Authorized Recyclers.
10. There is no manufacturing process involved in the LPG Bottling Plant. The operations can be divided into following stages:
  - i. Receipt of LPG through bullet trucks.
  - ii. Storage of LPG in storage tanks as per OISD norms.
  - iii. Filling of LPG into cylinders.
  - iv. Dispatch of LPG products through Vehicles (Lorries/ Stack Trucks)
11. MV Water Sprinkler system shall be provided in product pump house, TLD decantation Shed, all over the filling shed as per prevailing safety guidelines issued by OISD-144 and safety guidelines issued by OISD-150 shall be covering the Mounded Storage Vessels. 3 X 2500 M<sup>3</sup> capacity water tanks and Fire engines shall be provided.
12. All routine exercises shall be carried out on the basis of standard SOP as a part of preventive measures to eliminate leakage and accidents. Preventive maintenance of equipment shall be carried out as per OISD guidelines.
13. The following safety measures have been proposed to combat with emergency scenario that may arise within the Terminal due to accidental release of petroleum products through leakages/ spillages:
  - a) All liquid and vapor inlet-outlet valves of the mounded vessels are provided with fire safe remote operated valves.
  - b) Automated Fire Detection and Alarm System
  - c) Automated Fire Protection System (Hydrant & Sprinkler System)
  - d) Fire Extinguishers
  - e) Automated Hydrocarbon Detectors
  - f) Emergency Shutdown (ESD) System
  - g) Fire Water Storage
14. Land Use Details of the Site : Building : 0.376 Acres(1.18%); Operational Area : 3.002 Acres (9.38%); Mounded Storage Vessel area : 0.381 Acres (1.19%); Car Parking : 0.059 Acres (0.19%); Green Belt 12.00 Acres (37.50%); Truck Parking area : 5.149 Acres (16.09%); Fire Water tanks : 0.074 Acres (0.23%); Approach & Internal roads, paved area & drains : 7.919 Acres (24.75%); Open area : 3.040 Acres (9.05%)
15. CSR projects like Provision of Boundary wall and Class rooms in Kaipadar U P School; Class rooms, Deep tube well, water filter and water facility in the toilets in Deulatangi Nodal U P School, street light facility on road from Kuradmall village to Kaipadar village; skill development and vocational training of the women of the nearby villages are being taken up.

16. There is no National Park and Wild life sanctuary located within 10 km radius of the proposed project. Chandaka – Dampada Wild Life Sanctuary is around 27.5 km (NE) from the project site.
17. Terms of Reference was issued by the SEAC, Odisha vide letter no. 619, dated 06.10.2017 for EIA study. Public hearing for the proposal was conducted on 20.07.2018.

Considering the information / documents furnished by the proponent and presentation made by the consultant **ULTRA-TECH (Formerly Ultra-Tech Environmental Consultancy and Laboratory) Thane, Maharashtra** on behalf of the project proponent, the SEAC recommended for grant of Environmental Clearance for the project valid for a period of 7 years with stipulated conditions as per **Annexure – I**.

**ITEM NO. 02:**

**PROPOSAL FOR ENVIRONMENTAL CLEARANCE FOR CONSTRUCTION OF INTER-STATE BUS TERMINAL (ISBT) AT BARAMUNDA, BHUBANESWAR, ODISHA OF BHUBANESWAR DEVELOPMENT AUTHORITY WITH A TOTAL BUILT UP AREA 28, 124 M<sup>2</sup> (EC).**

The proponent did not attend the meeting. The SEAC decided to defer the proposal to next meeting.

**ITEM NO. 03:**

**PROPOSAL FOR ENVIRONMENTAL CLEARANCE FOR KALA BARRAGE PROJECT AT VILLAGE KALIAPAL, BLOCK-BARKOTE, TEHSIL-BARKOTE IN THE DISTRICT OF DEOGARH WITH CULTURABLE COMMAND AREA (CCA) – 4050 HA OF DEPARTMENT OF WATER RESOURCES, GOVT. OF ODISHA, (TOR).**

1. The proposal was considered by the committee to determine the "Terms of Reference (ToR)" for undertaking detailed EIA study for the purpose of obtaining environmental clearance in accordance with the provisions of the EIA Notification, 2006 and amendment thereafter.
2. The Kala Barrage project, in the present proposal is planned for construction of Barrage across river Kala, the left tributary of River Brahmani merges with the Rengali reservoir, near village Kaliapal of Barkote block under Deogarh District.
3. The Barrage and Appurtenant Head works are referred by;

Latitude ..... 21<sup>0</sup> 34' 48" N

Longitude..... 85<sup>0</sup> 04' 00" E

Topo Sheet..... 73 G/1, G/2, G/3, C/13, C/14 & C/15

**4. CONNECTIVITY:**

- Nearest Township – Barkote – 15 km
- District Headquarters – Deogarh-45 km
- Nearest Railway Station is Bimlagarh : 82 km on SE Railways
- Nearest Airport: Biju Pattnaik international airport 250 km

## 5. PROJECT DESCRIPTION:

- The Kala Barrage project, in the present proposal is planned for construction of Barrage across river Kala, the left tributary of River Brahmani merges with the Rengali reservoir, near village Kaliapal of Barkote block under Deogarh District.
- The Project is featured with construction of one barrage of 72.400 m long with two canals such as Left Main Canal of 34 km and Right Main Canal of 7.9 km long.
- 72.400 m long barrage having 8 nos. of 8 m x 4 m vertical gates; two nos. of Head regulators at either side of barrage to lead the reservoir water through two main canal systems (LMC & RMC) for covering Gross Command Area (GCA) of 4800 ha. and Culturable Command Area (CCA) of 4050 ha.
- The Reservoir impoundment at FRL 150.00 m will submerge 22.066 ha. of Land upstream of the Barrage, of which 17.210 ha of Forest Land, 0.028 ha private Land and 4.828 ha Govt. Land are involved.
- Two main canals and ancillary construction works similarly would involve 10.452 ha of Forest land out of the total land requirement of 91.253 ha for the project.
- 42 nos. villages of the Barkote Block of Deogarh district will avail the enhanced crop benefit due to the irrigated agriculture.
- Proposal for Diversion of 27.662 ha. forest land is being processed with utmost importance. Forest clearance is expected at the earliest.

## 6. NEED FOR THE PROJECT:

- The Socio-economic condition of the people in the area is extremely poor. The inhabitants of the area mostly belong to S.T, S.C and other weaker sections of society. The present land use practice & the method of traditional farming in the command area are continuing since generation together. The potentiality of the project when developed shall no doubt change the old and primitive method of cultivation. The output of cultivation is badly affected due to uneven and erratic rainfall. The only remedial measure to come out of this hazard is to provide assured irrigation. As such, there is necessity for construction of an irrigation project.
- On completion of the project the local people will immediately enjoy the facilities of assured irrigation and will be able to generate resources for development of the area.

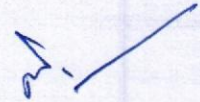
7. As per the cost estimate, the cost of the project is ₹ 16,632.00 lakhs at BC Ratio 1.62:1.

## 8. BENEFIT:

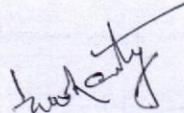
- Enhanced crop produce from Pre-Irrigation Quantity 49,300 quintal to post- Irrigation Quantity 2,66,900 quintal measured with financial benefit of ₹ 4345.20 Lakh/Annum as per DAO report.
- Employment Generation and socio economic Benefits.

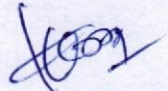
Considering the information / documents furnished by the proponent and presentation made by the consultant **Centre for Envotech & Management Consultancy Pvt. Ltd., N-5/305, IRC Village, Bhubaneswar, Odisha**, the SEAC prescribed the ToR as per **Annexure -II** for conducting detailed EIA study.

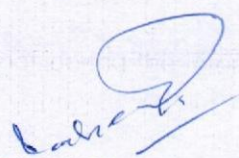
  
**DR. B. K. PATNAIK**  
CHAIRMAN

  
**SRI B.P. SINGH**  
MEMBER, SEAC

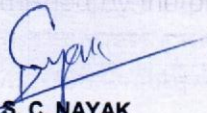
**SRI B.C. PRUSTY**  
MEMBER, SEAC

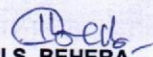
  
**SHRI A. C. MOHANTY**  
MEMBER, SEAC

  
**DR. D. K. ROUT**  
MEMBER, SEAC

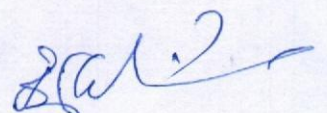
  
**DR. R.C. MOHANTY**  
MEMBER, SEAC


**DR. S.K. BISWAL**  
MEMBER, SEAC

  
**DR. S. C. NAYAK**  
MEMBER, SEAC

  
**SRI S. BEHERA**  
MEMBER, SEAC

**APPROVED**

  
**CHAIRMAN, SEAC**

  
**SECRETARY, SEAC**


## ANNEXURE - I

### **CONDITIONS TO BE STIPULATED IN ENVIRONMENTAL CLEARANCE OF M/S INDIAN OIL CORPORATION LIMITED FOR CONSTRUCTION OF LPG BULK STORAGE (1800 MT) & BOTTLING FACILITY (INDANE BOTTLING PLANT) AT PLOT NO. 708 AND 707 (P) AT - SOMANATHPUR; DIST-KHORDHA, ODISHA**

---

#### **I. Statutory compliance:**

1. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project.
2. The project proponent shall obtain clearance from the National Board for Wildlife, if applicable.
3. The project proponent shall prepare a Site-Specific Conservation Plan & Wildlife Management Plan and approved by the Chief Wildlife Warden. The recommendations of the approved Site-Specific Conservation Plan / Wildlife Management Plan shall be implemented in consultation with the State Forest Department. The implementation report shall be furnished along with the six-monthly compliance report, (incase of the presence of schedule-I species in the study area)
4. The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the State pollution Control Board, Odisha.
5. Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to.
6. During construction phase, air pollution and solid waste management aspects need to be properly addressed ensuring compliance of the Construction and Demolition Waste Management Rules, 2016.
7. The Company shall strictly comply with the rules and guidelines under Manufacture, Storage and Import of Hazardous Chemicals (MS1HC) Rules, 1989 as amended time to time. All transportation of Hazardous Chemicals shall be as per the Motor Vehicle Act (MVA), 1989.
8. The company should obtain all requisite clearances for fire safety and explosives and should comply with the stipulation made by the respective authorities.
9. Necessary approvals from Chief Controller of Explosives must be obtained before commission of project, if applicable.
10. The project proponent shall obtain and adhere to statutory clearance under the Coastal Regulation Zone Notification, 2011, as applicable

  
**Secretary, SEAC**

## **II. Air quality monitoring and preservation**

11. The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be complied with.
12. The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.
13. Regularly monitoring of VOC and HC in the work zone area in the plant premises should be carried out and data be submitted to SEIAA, Odisha, Regional Office of MoEF&CC, Bhubaneswar, CPCB and State Pollution Control Board, Odisha. Quarterly monitoring for fugitive emissions should be carried out as per the guidelines of CPCB and reports submitted to SEIAA, Odisha and Regional Office of MoEF&CC, Bhubaneswar.
14. During storage and handling, the fugitive emission of methane, if any, shall be monitored using Infra-red camera/ appropriate technology.
15. The project proponent also to ensure trapping/storing of the CO<sub>2</sub> generated, if any, during the process and handling.
16. The DG sets shall be equipped with suitable pollution control devices and the adequate stack height so that the emissions are in conformity with the extant regulations and the guidelines in this regard.
17. Water sprinkling has to be undertaken on regular basis to control the polluting particles.
18. Approach road shall be made pucca to minimize generation of suspended dust.

## **III. Water quality monitoring and preservation**


19. As already committed by the project proponent, Zero Liquid Discharge shall be ensured (applicable in case of the projects achieving the ZLD).
20. The Company shall harvest rainwater from the roof tops of the buildings and storm water drains to recharge the ground water and utilize the same for different industrial operations within the plant.

## **IV. Noise monitoring and prevention**

21. Acoustic enclosure shall be provided to DG set for controlling the noise pollution.
22. The overall noise levels in and around the plant area shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.
23. The ambient noise levels shall conform to the standards prescribed under Environment (Protection) Act, 1986 Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time).

## **V. Energy Conservation measures**

24. The energy sources for lighting purposes shall preferably be LED based.

  
**Secretary, SEAC**

## **VI. Waste management**

25. Oil spillage prevention and mitigation scheme shall be prepared. In case of oil spillage/ contamination, action plan shall be prepared to clean the site by adopting proven technology. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.

## **VII. Green Belt**

26. The green belt of 5-10 m width shall be developed in more than 33% of the total project area, mainly along the plant periphery, in downward wind direction, and along road sides etc. Selection of plant species shall be as per the CPCB guidelines in consultation with the State Forest Department.

## **VIII. Safety, Public hearing and Human health issues**

27. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and guidelines prepared by OISD, DGMS and Govt, of India. Mock drill should be conducted once in a month, onsite and off-site Disaster Management Plan shall be implemented.
28. Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.
29. Additional safety measures should be taken by using remote operated shut off valve, double block & bleed valve (DBB), impervious dyke wall and un-bonded flexible roof drain pipe, if applicable.
30. High and low-level alarms shall be fitted to plant storage tanks which can detect overfilling. However, proper supervision shall be done every time.
31. Unit should carry out safety audit and report submitted to SEIAA, Odisha and Regional Office of MoEF&CC, Bhubaneswar.
32. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
33. Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

## **IX. Corporate Environment Responsibility**

34. The project proponent shall comply with the provisions contained in this Ministry's OM vide F.No. 22-65/2017-IA.III dated 1st May 2018, as applicable, regarding Corporate Environment Responsibility.
35. The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms /



**Secretary, SEAC**




conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to SEIAA, Odisha and Regional Office of MoEF&CC, Bhubaneswar as a part of six-monthly report.

36. A separate Environmental Cell equipped with full-fledged laboratory facilities shall be set up to carry out the Environmental Management and Monitoring functions, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.
37. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose. Year wise progress of implementation of action plan shall be reported to SEIAA, Odisha and Regional Office of MoEF&CC, Bhubaneswar along with the Six Monthly Compliance Report.
38. Self-environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

**X. Miscellaneous (Applicable only for LPG storage)**

39. No packing/loading/unloading of LPG cylinders shall be made on road/outside factory premises. Vehicles loaded/un loaded with LPG cylinders shall be parked inside the plant premises only and not on road sides.
40. The proponent shall strictly follow Oil Industry Safety Directorate (OISD) norms/guidelines for installation and design of equipments and operation of the LPG Bottling Plants.
41. Cylinders should be filled with the LPG and should never be over-filled. Cylinders should be checked before and after filling to ensure that they are fit to fill, have been correctly filled, are gas tight and will be trouble-free in service.
42. Cylinder filling operations should be carried out in accordance with a reputable technical standard or code such as ISO 10691.
43. Road tankers should be equipped to the standard specified in national regulations reputable code. Vehicles should be mobilized during transfer operations and equipped to prevent untimely movement. Loading/unloading bays should be protected against impact. Fire-resistant coatings shall be provided to tanks/vessels.
44. Sections of pipeline and storage systems that can be isolated with valves or blinds should be equipped with safety valves to protect against possible damage as liquid LPG expands with increases in temperature.
45. The norms/guidelines of Oil Industry Safety Directorate (OISD) for installation and design of equipments and operation of the LPG Bottling Plants shall be strictly followed. Safety audit to be carried out and report submitted to the Regional Office.
46. The project proponent shall conduct a traffic density survey on the approach road


  
Secretary, SEAC

to be used for transportation of LPG tankers and LPG cylinders.

47. Static electricity discharge shall be checked. Steel structures and pipeline should be securely earthed. Road tankers should be bonded to earth before LP Gas transfers commence and remain so until the operation is complete and the hose is disconnected.
48. The proponent shall strictly comply with Government of India's Gas Cylinder Rules and its amendments.

#### **XI. Miscellaneous (General)**

49. The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.
50. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.
51. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.
52. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the ministry of Environment, Forest and Climate Change at environment clearance portal.
53. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.
54. The project proponent shall inform the SEIAA, Odisha as well as Regional Office of MoEF&CC, Bhubaneswar the date of commencing the land development work and completion of the project.
55. Restoration of the project site shall be carried out satisfactorily and report shall be sent to the SEIAA, Odisha as well as Regional Office of MoEF&CC, Bhubaneswar.
56. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.
57. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report, commitment made during Public Hearing and also that during their presentation to the State Level Expert Appraisal Committee (SEAC), Odisha.
58. No further expansion or modifications in the plant shall be carried out without prior approval of the SEIAA, Odisha.

  
**Secretary, SEAC**

59. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.
60. The SEIAA, Odisha may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.
61. The SEIAA, Odisha reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.
62. The Regional Office, MoEF&CC, Bhubaneswar shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer (s) of the Regional Office by furnishing the requisite data / information / monitoring reports.
63. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Trans boundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules.
64. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.



**Secretary, SEAC**

**TERMS OF REFERENCE FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT FOR KALA BARRAGE PROJECT AT VILLAGE KALIAPAL, BLOCK-BARKOTE, TEHSIL-BARKOTE IN THE DISTRICT OF DEOGARH WITH CULTURABLE COMMAND AREA (CCA) – 4050 HA OF DEPARTMENT OF WATER RESOURCES, GOVT. OF ODISHA.**

---

**1) Scope of EIA Studies**

The EIA Report should identify the relevant environmental concerns and focus on potential impacts that may change due to the construction of proposed project. Based on the baseline data collected for three (3) seasons (Pre-monsoon, Monsoon and Winter seasons), the status of the existing environment in the area and capacity to bear the impact on this should be analyzed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.

**2) Details of the Project and Site**

- General introduction about the proposed project.
- Details of project and site giving L-sections of all U/S and D/S projects of River with all relevant maps and figures. Connect such information as to establish the total length of interference of Natural River and the committed unrestricted release from the site of diversion into the main river.
- A map of boundary of the project site giving details of protected areas in the vicinity of project location.
- Location details on a map of the project area with contours indicating main project features. The project layout shall be superimposed on a contour map of ground elevation showing main project features (viz. location of dam, Head works, main canal, branch canals, quarrying etc.) shall be depicted in a scaled map.
- Layout details and map of the project along with contours with project components clearly marked with proper scale maps of at least a 1:50,000 scale and printed at least on A3 scale for clarity.
- Existence of National Park, Sanctuary, Biosphere Reserve etc. in the study area, if any, should be detailed and presented on a map with distinct distances from the project components.
- Drainage pattern and map of the river catchment up to the proposed project site.
- Delineation of critically degraded areas in the directly draining catchment on the basis of silt Yield Index as per the methodology of All India Soil and Land Use Survey of India.
- Soil characteristics and map of the project area.
- Geological and seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and powerhouse site.
- Remote Sensing studies, interpretation of satellite imagery, topographic sheets along with ground verification shall be used to develop the land use/land cover pattern of the study using overlaying mapping techniques viz. Geographic Information System (GIS), False Color composite (FCC) generated from satellite data of project area.

- Land details including forests, private and other land.
- Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.

### 3) Description of Environment and Baseline Data

To know the present status of environment in the area, baseline data with respect to environmental components air, water, noise, soil, land and biology & biodiversity (flora & fauna), wildlife, socio-economic status etc. should be collected with 10 km radius of the main components of the project/site i.e. dam site and power house site. The air quality and noise are to be monitored at such locations which are environmentally & ecologically more sensitive in the study area. The baseline data should be collected for 3 seasons (Pre-Monsoon, Monsoon and Post Monsoon). Flora -Fauna in the Catchment and command area should be documented. The study area should comprise of the following:

- Catchment area up-to the dam site.
- Submergence Area
- Project area or the direct impact area should comprise of area falling within 10 km radius from the periphery of reservoir, land coming under submergence and area downstream of dam upto the point where Tail Race Tunnel (TRT) meets the river.

### 4) Details of the Methodology

- The methodology followed for collection of base line data along with details of number of samples and their locations in the map should be included.
- Study area should be demarcated properly on the appropriate scale map.
- Sampling sites should be depicted on map for each parameter with proper legends.
- For forest classification, Champion and Seth (1968) classification should be followed.

### 5) Methodology for collection of Biodiversity Data

- The number of sampling locations should be adequate to get a reasonable idea of the diversity and other attributes of flora and fauna. The guiding principles should be the size of the study area (larger area should have larger number of sampling locations) and inherent diversity at the location, as known from secondary sources (e.g. eastern Himalayan and low altitude sites should have a larger number of sampling locations owing to higher diversity).
- The entire area should be divided in grids of 5km X 5km preferably on a GIS domain. There after 25% of the grids should be randomly selected for sampling of which half should be in the directly affected area (grids including project components such as reservoir, dam, powerhouse, tunnel, canal etc.) and the remaining in the rest of the area (areas of influence in 10 km radius form project components). At such chosen location, the size and number of sampling units (e.g. quadrats in case of flora/transects in case of fauna) must be decided by species area curves and the details of the same (graphs and cumulative number of species in a tabulated form) should be provided in the EIA report. Some of the grids on the edges may not be completely overlapping with the study area boundaries. However these should be counted and considered for selecting 25% of the grids. The number of grids to be surveyed may come out as a decimal number (i.e. it has an integral and a fractional part) which should be rounded to the next whole number.

- The conventional sampling is likely to miss the presence of rare, endangered and threatened (R.E.T.) species since they often occur in low densities and in case of faunal species are usually secretive in behaviour. Reaching the conclusion about the absence of such species in the study area based on such methodology is misleading. It is very important to document the status of such species owing to their high conservation value. Hence likely presence of such species should be ascertained from secondary sources by a proper literature survey for the said area including referring to field guides which are now available for many taxonomic groups in India. Even literature from studies/surveys in the larger landscapes which include the study area for the concerned project must be referred to since most species from adjoining catchments is likely to be present in the catchments in question. In fact such literature from the entire state can be referred to. Once a listing of possible R.E.T. species from the said area is developed, species specific methodologies should be adopted to ascertain their presence in the study area which would be far more conclusive as compared to the conventional sampling. If the need be, modern methods like camera trapping can be resorted to, particularly for areas in the eastern Himalayas and for secretive/nocturnal species. A detailed listing of the literature referred to, for developing lists of R.E.T. species should be provided in the EIA reports.
- The R.E.T. species referred to in this point should include species listed in Schedule I and II of Wildlife (Protection) Act, 1972 and those listed in the red data books (BSI, ZSI and IUCN).

## 6) Components of the EIA Study

Various aspects to be studied and provided in the EIA/EMP report are as follows:


### A. Physical and Chemical Environment

#### (i) Geological & Geophysical Aspects and Seismo - Tectonics:

- Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
- Tectonics, seismicity and history of past earthquakes in the area. A site specific study of the earthquake parameters will be done. The results of the site specific earthquake design shall be sent for approval of the NCSDP (National committee of Seismic Design Parameters, Central water commission, New Delhi for large dams.
- Landslide zone or area prone to landslide existing in the study area should be examined.
- Presence of important economic mineral deposit, if any.
- Justification for location & execution of the project in relation to structural components (dam height).
- Impact of project on geological environment.

#### (ii) Meteorology, Air and Noise:

- Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.

  
Secretary, SEAC

- Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials <10 microns, Sulphur Dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) in the study area at 6 locations.
- Existing noise levels and traffic density in the study area at 6 locations.

**(iii) Soil Characteristics**

- Soil classification, physical parameters (viz., texture, porosity, bulk density and water holding capacity) and chemical parameters (viz. pH, electrical conductivity, magnesium, calcium, total alkalinity, chlorides, sodium, potassium, organic carbon, available potassium, available phosphorus, SAR, nitrogen and salinity, etc.) (6 locations).

**(iv) Remote sensing and GIS Studies**

- Generation of thematic maps viz., slope map, drainage map, soil map, land use and land cover map, etc. Based on these, thematic maps, an erosion intensity map should be prepared.
- New configuration map to be given in the EIA Report.

**(v) Water Quality**

- History of the ground water table fluctuation in the study area.
- Water quality for both surface water and ground water for (i) Physical parameters (pH, temperature, electrical conductivity, TSS); (ii) Chemical parameters (Alkalinity, Hardness, BOD, COD, NO<sub>2</sub>, PO<sub>4</sub>, Cl, SO<sub>4</sub>, Na, K, Ca, Mg, Silica, Oil & Grease, phenolic compounds, residual sodium carbonate); (iii) Bacteriological parameter (MPN, Total coliform) and (iv) Heavy Metals (Pb, As, Hg, Cd, Cr-6, total Cr, Cu, Zn, Fe) (10 locations).
- Delineation of sub and micro-watersheds, their locations and extent based on the All India Soil and Land Use Survey of India (AISLUS), Department of Agriculture, Government of India. Erosion levels in each micro-watershed and prioritization of micro-watershed through silt yield index (SYI) method of AISLUS.

**B. Water Environment & Hydrology**

- Hydro-Meteorology of the project viz. precipitation (snowfall, rainfall), temperature, relative humidity, etc. Hydro-meteorological studies in the catchment area should be established along-with real time telemetry and data acquisition system for inflows monitoring.
- Run off, discharge, water availability for the project, sedimentation rate, etc.
- Basin characteristics
- Catastrophic events like cloud bursts and flash floods, if any, should be documented.



Secretary, SEAC


- For estimation of Sedimentation Rate, direct sampling of river flow is to be done during the EIA study. The study should be conducted for minimum one year. Actual silt flow rate to be expressed in ha-m km<sup>2</sup> year<sup>-1</sup>.
- Sedimentation data available with CWC may be used to find out the loss in storage over the years.
- Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.
- Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
- A table of 10-daily water discharges corresponding to 90% dependable year showing the intercepted discharge at the barrage, the environmental flow to be released and the other flow releases downstream of the barrage and spills to be provided in hydrology section of EIA.
- Norms for release of Environmental flows, i.e. 30% in monsoon season, 20% in lean season and 25% in non-monsoon & non-lean season to be followed corresponding to 90% dependable year. A site specific study on minimum environment flow should be carried out.
- Hydrological studies/data as approved by CWC shall be utilized in the preparation of EIA/EMP report. Actual hydrological annual yield may also be given in the report.
- A minimum of 1 km distance from the tip of the reservoir to the tail race tunnel should be maintained between upstream and downstream projects.

### **C. Biological Environment**

Besides primary studies, review of secondary data/literature published for project area on flora & fauna including RET species shall be reported in EIA/EMP report.

#### **(i) Flora**

- Characterization of forest types (as per Champion and Seth method) in the study area and extent of each forest type as per the Forest Working Plan.
- Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteridophytes, Bryophytes, Lichens (all groups). All species list may be provided.
- General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
- Assessment of plant species with respect to dominance, density, frequency, abundance, diversity index, similarity index, importance value index (IVI), Shannon Weiner index etc. of the species to be provided. Methodology used for calculating various diversity indices along with details of locations of quadrates, size of quadrates etc. to be reported within the study area in different ecosystems.
- Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.

  
**Secretary, SEAC**




- Economically important species like medicinal plants, timber, fuel wood etc.
- Details of endemic species found in the project area.
- Flora under RET categories should be documented using International Union for the Conservation of Nature and Natural Resources (IUCN) criteria and Botanical Survey of India's Red Data list along-with economic significance. Species diversity curve for RET species should be given.
- Biodiversity study, a sub-component of EIA study, is to be carried-out by associating a reputed organisation/institution as recommended by WII, Dehradun or by ICFRE, Dehradun. A list of such institutes is available on MoEF's website.
- Cropping pattern and Horticultural Practices in the study area.

**(ii) Fauna**

- Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status along-with Schedule of the species.
- Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
- Information (authenticated) on Avi-fauna and wildlife in the study area.
- Status of avifauna their resident/ migratory/ passage migrants etc.
- Documentation of butterflies, if any, found in the area.
- Details of endemic species found in the project area.
- RET species-voucher specimens should be collected along-with GPS readings to facilitate rehabilitation. RET faunal species to be classified as per IUCN Red Data list and as per different schedule of Indian Wildlife (Protection) Act, 1972.
- Existence of barriers and corridors, if any, for wild animals.
- Compensatory a forestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
- Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.

**D. Aquatic Ecology**

- Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplanktons, benthos etc.
- Fish and fisheries, their migration and breeding grounds.
- Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
- Conservation status of aquatic fauna.

  
**Secretary, SEAC**

## **E. Socio-Economic**


- Collection of baseline data on human settlements, health status of the community and existing infrastructure facilities for social welfare including sources of livelihood, job opportunities and safety and security of workers and surroundings population.
- Collection of information with respect to social awareness about the developmental activity in the area and social welfare measures existing and proposed by project proponent.
- Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.
- The socio-economic survey/ profile within 10 km of the study area for demographic profile; Economic Structure; Developmental Profile; Agricultural Practices; Infrastructure, education facilities; health and sanitation facilities; available communication network etc.
- Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
- Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
- Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
- List of all the Project Affected Families with their name, age, educational qualification, family size, sex, religion, caste, sources of income, land & house holdings, other properties, occupation, source of income, house/land to be acquired for the project and house/land left with the family, any other property, possession of cattle, type of house etc.
- In addition to socio-economic aspects of the study area, a separate chapter on socio-cultural aspects based upon study on Ethnography of the area should be provided.

## **7) Impact Prediction and Mitigation Measures**

The adverse impact due to the proposed project should be assessed and effective mitigation steps to abate these impacts should be described.

### **(i) Air Environment**

- Changes in ambient and ground level concentrations due to total emissions from point, line and area sources.
- Effect on soil, material, vegetation and human health.
- Impact of emissions from DG set used for power during the construction, if any, on air environment.
- Pollution due to fuel combustion in equipments and vehicles

  
**Secretary, SEAC**

- Fugitive emissions from various sources
- Impact on micro-climate

**(ii) Water Environment**

- Changes in surface and ground water quality
- Steps to develop pisci-culture and recreational facilities
- Changes in hydraulic regime and downstream flow.
- Water pollution due to disposal of sewage
- Water pollution from labour colonies/ camps and washing equipment.

**(iii) Land Environment**

- Adverse impact on land stability, catchment of soil erosion, reservoir sedimentation and spring flow (if any) (a) due to considerable road construction / widening activity (b) interference of reservoir with the inflowing stream (c) blasting for commissioning of HRT, TRT and some other structures.
- Changes in land use / land cover and drainage pattern.
- Immigration of labour population.
- Quarrying operation and muck disposal.
- Changes in land quality including effects of waste disposal.
- River bank and their stability.
- Impact due to submergence.

**(iv) Biological Environment**

- Impact on forests, flora, fauna including wildlife, migratory avi-fauna, rare and endangered species, medicinal plants etc.
- Pressure on existing natural resources.
- Deforestation and disturbance to wildlife, habitat fragmentation and wild animal's migratory corridors.
- Compensatory a forestation-identification of suitable native tree species for compensatory a forestation and green belt.
- Impact on fish migration and habitat degradation due to decreased flow of water.
- Impact on breeding and nesting grounds of animals and fish.

**(v) Socio-economic aspects**

- Impact on local community including demographic profile.
- Impact on socio-economic status.



**Secretary, SEAC**

- Impact on economic status.
- Impact on human health due to water / vector borne disease
- Impact on increase traffic.
- Impact on Holy Places and Tourism.
- Impacts of blasting activity during project construction which generally destabilize the land mass and leads to landslides, damage to properties and drying up of natural springs and cause noise pollution will be studied. Proper record shall be maintained of the baseline information in the post project period.
- Positive and negative impacts likely to be accrued due to the project are listed.

## **ENVIRONMENTAL MANAGEMENT PLANS**

**Catchment Area Treatment (CAT) Plan** should be prepared micro-watershed wise. Identification of free draining/ directly draining catchment based upon Remote Sensing and Geographical Information System (GIS) methodology and Sediment Yield Index (SYI) method of AISLUS, Deptt. Of Agriculture, Govt, of India coupled with ground survey. Areas or watersheds falling under 'very severe' and 'severe' erosion categories should be provided and required to be treated. Both biological as well as engineering measures should be proposed in consultation with State Forest Department for areas requiring treatment. Year-wise schedule of work and monetary allocation should be provided. Mitigation measures to check shifting cultivation in the catchment area with provision for alternative and better agricultural practices should be included.


**Command Area Development (CAD) Plan** giving details of implementation schedule with a sample CAD plan.

**Compensatory Afforestation** shall be prepared by the State Forest Department in lieu of the forest land proposed to be diverted for construction of the project as per the Forest (Conservation) Act, 1980. Choice of plants for afforestation should include native and RET species, if any.

**Biodiversity and Wildlife Conservation and Management Plan** for the **Conservation and preservation of rare, endangered or endemic floral/ faunal species or some National Park/Sanctuary/ Biosphere Reserve or other protected area is going to get affected directly or indirectly by construction of the project, then suitable conservation measures should be prepared in consultation with the State Forest Department.**

**Fisheries Conservation and Management Plan** - a specific fisheries management measures should be prepared for river and reservoir. If the construction of fish ladder/ fish-way etc. is not feasible then measures for reservoir fisheries will be proposed. The plan will detail out the number of hatcheries, nurseries, rearing ponds etc. proposed under the plan with proper drawings. If any migratory fish species is getting affected then the migratory routes, time/season of upstream and downstream migration, spawning grounds etc will be discussed in details.

**Resettlement and Rehabilitation Plan** needed to be prepared on the basis of findings of the socio-economic survey coupled with the outcome of public consultation held. The R&R

  
**Secretary, SEAC**

package shall be prepared after consultation with the representatives of the project affected families and the State Government. Detailed budgetary estimates are to be provided. Resettlements site should be identified. The plan will also incorporate community development strategies. *R&R Plan is to be formulated as per Land Acquisition, Rehabilitation and Resettlement Act, 2013 which came into force w.e.f. 1.1.2014.*

**Green Belt Development Plan** along the periphery of the reservoir, approach roads around the colonies and other project components, local plant species must be suggested with physical and financial details. Local plant species suitable for greenbelt should be selected.

**Reservoir Rim Treatment Plan** for stabilization of land slide/ land slip zones, if any, around the reservoir periphery is to be prepared based on detailed survey of geology of the reservoir rim area. Suitable engineering and biological measures for treatment of identified slip zones to be suggested with physical and financial schedule.

**Muck Disposal Plan** suitable sites for dumping of excavated materials should be identified in consultation with State Pollution Control Board and State Forest Department. All muck disposal sites should be minimum 30 in away from the HFL of river. Plan for rehabilitation of muck disposal sites should also be given. The L-section/cross section of muck disposal sites and approach roads should be given. The plan shall have physical and financial details of the measures proposed.

**Restoration Plan for Quarry Sites and landscaping** of colony areas, working areas, roads etc. Details of the coarse/fine aggregate/clay etc. required for construction of the project and the rock/clay quarries/river shoal sites identified for the project should be discussed along-with the Engineering and Biological measures proposed for their restoration with physical and financial details. Layout map showing quarry sites vis- a-vis other project components, should be prepared.

**Study of Design Earthquake Parameters:** A site specific study of earthquake parameters should be done. Results of the site specific earthquake design parameters should be approved by National Committee of Seismic Design Parameters, Central Water Commission (NCSDP), New Delhi.

**Dam Break Analysis and Disaster Management Plan** The outputs of dam break model should be illustrated with appropriate graphs and maps clearly bringing out the impact of Dam Break scenario. The action plan will include Emergency Action and Management plan including measures like preventive action notification, warning procedure and action plan for co-ordination with various authorities.


**Water, Air and Noise Management Plans** to be implemented during construction and post-construction periods.

Mitigating measures for **impacts due to Blasting** on the structures in the vicinity.

#### **GROUND WATER MANAGEMENT PLAN.**

**Public Health Delivery Plan** including the provisions of drinking water supply for local community.

**Labour Management Plan** for their Health and Safety.


  
Secretary, SEAC

**Sanitation and Solid waste Management plan** for domestic waste from colonies and labour camps etc.

**Local Area Development Plan** to be formulated in consultation with the Revenue Officials and Village Pancahayats. Local skill development schemes should be given. Details of various activities to be undertaken along with its financial outlay should be provided.

**Environmental safeguards during construction including Road Construction.**

- **Energy Conservation Measures.**
  - **Environmental Monitoring Programme** with physical & financial details covering all the aspects of EMP. A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.
- 8) **In the EMP, a sample CAD plan for a distributary outlet command is also included. Such a plan is to show the alignment of irrigation and drainage channels. The components of the On Farm Development (OFD) works to be undertaken may be clearly mentioned along with a time schedule for their completion vis-&-vis the progress of irrigation development.**
- 9) **Additional ToR**
- (i) Three (3) seasons data should be collected for the entire project.
  - (ii) A detailed irrigation management plan should be worked out so that at least 10% of the CCA would be covered by micro irrigation scheme.
  - (iii) Land acquired for the project shall be suitably compensated in accordance with the law of the land with the prevailing guidelines. Private land shall be acquired as per provision of Right to Fair Compensation and Transparency in Land acquisition, Rehabilitation and Resettlement Act, 2013
  - (iv) The project involves about 27.662 ha. of forest land. Forest clearance should be obtained as per the prevailing norms.
- 10) **The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP report, as per the O.M. No. J-11013 / 41 / 2006-IA.II(I)(Part), dated 29.08.2017.**

  
**Secretary, SEAC**