PROCEEDINGS OF THE MEETING OF STATE LEVEL EXPERT APPRAISAL COMMITTEE, ODISHA HELD ON 05TH JULY 2023

The SEAC met on 05th July 2023 at 10:30 AM in the Conference Hall of Odisha State Pollution Control Board, Bhubaneswar under the Chairmanship of Sri Sashi Paul. The following members were present in the meeting.

1.	Sri Sashi Paul	-	Chairman (through VC)
2.	Dr. K. Murugesan	-	Member Secretary
3.	Dr.Chittaranjan Panda	-	Member
4.	Prof. (Dr.) H.B. Sahu	-	Member (through VC)
5.	Sri Jayant Das	-	Member (through VC)
6.	Er. Fakir Mohan Panigrahi	-	Member (through VC)
7.	Prof. (Dr.) B.K. Satpathy	-	Member
8.	Dr. K.C.S Panigrahi	-	Member (through VC)
9.	Prof. (Dr.) Abanti Sahoo	-	Member (through VC)
10.	Dr. Ashok Kumar Sahu	-	Member
11.	Dr. Rabinarayan Patra	-	Member

The following expert member attended the meeting on request to give his expert views on a Hydro-electric Project during appraisal.

1.	Er. Kumuda Ranjan Acharya	-	Expert Member

Draft proceedings of the meeting was finalized by the members through e-mail and final proceedings of the meeting was confirmed by the members through e-mail. The agenda-wise proceedings and recommendations of the committee are detailed below.

ITEM NO. 01

PROPOSAL FOR ENVIRONMENTAL CLEARANCE FOR KHARAG HYDROELECTRIC PROJECT (HEP) 63 MW (3X21 MW) OVER AN AREA 129.59 HA. THE PROJECT IS LOCATED IN KANDHAMAL DISTRICT OF ODISHA AND ON RIVER KHARAG, A TRIBUTARY OF TEL RIVER, IN MAHANADI BASIN OF SRI LAXMIDHAR BEHERA - 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. **Category**: As per EIA Notification,2006 and its subsequent amendments, the proposed project falls under B1(< 100 MW hydroelectric power generation) category under Schedule of activity 1(c)-River Valley Projects.
3. This proposal is for Terms of Reference for obtaining Environmental Clearance for Kharag Hydroelectric Project (HEP) 63 MW (3x21 MW) over an area 129.59 ha. the project is in Kandhamal district of Odisha on river Kharag, a tributary of Tel River, in Mahanadi Basin of Sri Laxmidhar Behera.

4. **Location and connectivity**: The proposed site of the project is located in Kandhamal district of Odisha on river Kharag, a tributary of Tel River, in Mahanadi Basin. The barrage site is located near Kudelkia village and lies in the Barakuma Reserve Forest. Geo Coordinates of the barrage axis site are approximately 20^0 18' 8.27" N Latitude and 83^0 51' 39.70" E Longitude. The powerhouse site is located near Doka village. Geo Coordinates of the powerhouse site are approximately 22^0 22' 53.33" N Latitude and 83^0 49' 46.74" E Longitude. The barrage site is approachable by road from Baliguda via Barakhaman to Junagan to Selgura to Keramaha leading to Kudelkia. The nearest Rail head is at Bolangir and Bhawanipatna. The nearest airport is at Bhubaneswar. Baliguda is 288 Km away from Bhubaneswar (connected with NH-16, NH-57 & SH-1) and 80 Km away from Phulbani on SH-1 (all weather SH road). Barakhaman Panchayat is connected to Baliguda with 8.5 Km long all weather village road. Kudelkia village is connected to Barakhaman Panchayat by a 10 Km long all weather village road, which is damaged at few locations. Doka village is connected to Kudelkia village by a 8 Km long PMGSY road. This road passes through 3 nos. of small culverts, 2 nos. of small concrete bridges and 2 nos. of small metallic bridges.
5. Complete Odisha state is falling in 2nd zone of seismicity as per the IS code and therefore construction on proposed project is safe.
6. **Project details**: Installed capacity of each power project (Kharag-I, Kharag-II, Kharag-IIA & Kharag-III), for which PFRs are prepared, was 24 MW (i.e. < 25 MW), therefore, power potential studies were carried out based on 75% dependable years. WAPCOS carried out studies for merging four projects into single stage considering 90% dependable year for which the Installed Capacity has been estimated as 63 MW. If the studies are based on 75% dependable inflows IC works out to be 111 MW, which is not as per guidelines. As installed capacity of Kharag HEP in Single Stage Development works out more than 25 MW, therefore, power potential studies in Single Stage Development need to be carried out based on 90% dependable year inflows(As per CEA guidelines 2015).
7. **Salient features of the project**:

DESCRIPTION	DETAIL
State	Odisha
District	Kandhamal
River	Kharag
Catchment area	1495 ha
Design flood return period (1 in 50 years)	5000 m^3/s
Maximum Water Level (MWL)	El. 501 m
Full Reservoir Level (FRL)	El. 499.30 m
Minimum Draw Down Level (MDDL)	El. 497.0 m
Live Storage Capacity	0.857 Mcum
Gross Storage Capacity at FRL and MDDL	1.807 and 0.950 Mcum
Type of structure	Concrete barrage
Number of bays	12 including 2 number sluice bays
Height of barrage above river bed level	13.3 m
Barrage Service Gate Opening Size	12×9.3 m

Type	Vertical Lift Slide Type
Hoist	Electrically Operated Rope Drum Hoist
Head Race Tunnel	8.78 KM long, D-shaped, 5 meter dia
Submergence Area at FRL	44.84 ha
Desilting chamber type	Underground (twin chamber)
Barrage Under Sluice Gates Opening Size	12×11.3 m
Type	Vertical Lift Fixed Wheel Type
Hoist	Electrically Operated Rope Drum Hoist
Turbine Type	Vertical Axis Francis
Rated Net Head	215.23 m
Design discharge	10.91 cumec/unit
Speed	600 rpm
Draft Tube Gate Opening Size	4×1.6 m
Type	Vertical Lift Fixed Wheel Type
Hoist	Electrically Operated Rope Drum Hoist
Normal Tail Water Level	El. 273.05 m
Maximum Tail Water Level	El. 278.7 m
Minimum Tail Water Level	El. 272.5 m
Type and location of power house	Surface, right side of river
Installed capacity	63 MW
Design discharge	32.74 cumec
Rated net head	215.23 m
Rated speed	600 rpm
Generator rating	21 MW/24.7 MVA
Generation voltage	11 KV
No. of Bays	7 Nos. (3 nos. GT Bays, 1 no. SAT Bay, 2 no. Line Bay, 1 no. Bus Coupler)
Rating of generator step up transformer	28 MVA, 11 kV/132 kV, 3-PHASE
Distance from nearest sub-station at saintala	50 km
Design energy	233.5 mu

8. **Land requirement**:

S. No.	Type of Land	Area (ha)
1.	Forest Land	71.078
2.	Revenue/Government Land	35.036
3.	Private/Leased Land	23.476
	Total	129.6

Zone	Project Appurtenance	Approximate Area (ha.)
1	Head Works (Diversion Structure, Barrage)	5.7
2	Reservoir Area upto MWL (El.502m) from dam axis	50.5
3	Construction Equipment, Aggregate Processing Plant and Material Storage Plant	5.5
4	Approach Road, Batching and Mixing plant	1.25
5	Intake and Desilting chamber	1.0
6	Water conductor system Notional Requirement	10
7	Explosives Magazine	0.3
8	Office and Colony Area	6.3
9	Dispensary, Material Testing Laboratory, Ware House, Storage, Repair Facility and Workshop	4
10	Surge Shaft to Powerhouse area, Switchyard, Construction Equipment, Batching and Mixing Plant & Storage of EM package Equipment	8.0
11	Aggregate Processing Plant and Material Storage area	4.75
12	Work shop Fabrication yard	2.00
13	Contractor and Labour Colony area	3
14	Borehole Land Requirement for 11 no. Boreholes	4.29
	Total	**106.59**

9. **Hydrology**: Proposed project is located on Kharag River and the source of water for this scheme is proposed Kharag Barrage (CA is 1495 sq km). Kharag river is a tributary of Tel river in Mahanadi basin. Design Flood (return period 1 in 50 years) is 5000 m^3/s. It has been envisaged to construct a Barrage on Kharag River near Kudelkia village in Kandhamal district with a gross storage capacity of 1.807 Mcum at Full Reservoir Level (FRL) 499.30m and submergence area as 44.84 ha. Gross Storage Capacity at MDDL would be 0.950 Mcum. Live Storage Capacity would be 0.857 Mcum. The Monthly observed discharge data of 38 years from 1979-80 to 2016-17 has been used for hydrology Studies.90% dependable year for the study is taken as 1988-89. Total Discharge for 3 Units would be 32.74 m^3/sec.

10. A reinforced concrete barrage about 14.50m above the riverbed and about 18.0 m above the deepest foundation level is proposed to divert a design flow of 32.74m^3/s through a 5.0m

diameter D-shaped, 10.9 km long water conductor system, comprising Power Intake Structure, Desilting Basin, Head Race Tunnel on the right bank of Kharag river, with its headportal downstream of desilting basin and tail portal near surge shaft. A surge shaft of 13 m dia. is proposed at the end of Head Race Tunnel. A pressure Shaft about 712m long is proposed to take off at the bottom of this shaft up to Valve House. Beyond the Valve House, 3.25 m diameter penstock of length of 1.33 km feeds three Francis Turbines driven generating units to be housed in a surface Powerhouse located on the right bank of river Kharag. The project is a run of the river scheme with a total installed capacity of 63 MW (3x21 MW) utilizing a gross head of 225.48m (Net head 215.23m) to generate 233.5 GWh of energy in an Average year. The tail water will be discharged through a tail pool back to river Kharag.

11. **Electro-mechanical**: Project has a surface power station with an Installed Capacity of 63MW (3 x 21MW). The powerhouse has three (3) units of Vertical axis Francis turbine-driven generating units, rated for 21MW each. The project shall utilize the plant discharge of 32.74 m3/sec through a rated net head of about 215.23 m for power generation. The generation voltage of 11kV shall be stepped up to 132kV by 28 MVA, 3-phase transformer.

12. **Power evacuation**: Power would be evacuated at 132kV level Phulbani pooling station at a distance of 25 KM.

13. **Catchment area treatment plan:** Catchment Area intercepted at the dam site is 1485 sq. km. CAT (Catchment Area Treatment**)** Plan for proposed dam site will be prepared using Silt Yield Index method. Delineation of sub watersheds in the catchment area. Land use pattern using satellite data, slope map using Survey of India Topo-sheets etc. with ground truth verification will be prepared. Mapping of critically degraded areas based on Integration of Remote Sensing technique, GIS methodology and Silt Yield Index method. Preparation of phase wise Catchment Area Treatment (CAT) Plan using biological and engineering measures for sub-watersheds with very high and high erosion intensity. Estimation of cost required for implementation of CAT plan. Spatial information in each micro watershed shall be earmarked on maps in the scale of 1:50,000.

14. **Project cost**: The estimated hard cost of the project is Rs. 627.75 crores at December, 2018 price level excluding Transmission line cost. Out of this cost, the cost of the civil works is Rs. 456.11 Crores, Cost of H&M Works is Rs. 54.48 Crore and the cost of electromechanical works is Rs. 117.16 Crores. Total escalated cost of above works upto zero date is Rs. 663.07 Crores. IDC and Financing Cost are expected to be Rs. 78.66 Crores on escalated cost. The project cost including IDC & FC is Rs.741.73 Cr. Cost of generation has been worked out on this cost. The cost of generation in the first year of operation is estimated at Rs. 7.88 per kWh and on levelized basis over a 35-year period works out to Rs. 7.37 per kWh.

15. **Environment Consultant**: The Environment consultant **M/s WAPCOS LTD.** along with the proponent made a presentation on the proposal before the Committee.

Considering the information / documents furnished by the proponent and presentation made by the consultant **M/s WAPCOS LTD**, the SEAC prescribed the following specific ToRs in addition to standard ToRs as per **Annexure – A** for conducting detailed EIA study.

i) **Ecological flow:** The presentation covered a monthly flow series of Khadaga river flow and the generation is calculated on the basis of 90% dependable yield of the Basin at the Barrage location. It is observed from the flow series the river never goes dry during lean months but the flow reduces to as low as 0.9 cusecs. The project proponent explained that provision of ecological flow of 20% during lean months and 30% during monsoon shall be released to the river and power potential has been computed accordingly. Power potential calculation shows there is spill in the barrage only in the month of August and in other months entire river water shall be diverted for power generation. The flow reduction and lean season flow of 20% minimizing to 0.18 cumecs virtually keeps the river dry and may create utter hazard to the aquatic life (flora & Fauna) within the original stretch of river from barrage to tail race. A detailed study of impact on flora and fauna due to flow fluctuation within the intermediate stretch of river (Barrage to Tail race) may be made with Management Plan.

ii) **Excavated mock/soil disposal Plan:** It is proposed to excavate a tunnel of 5.8 m diameter for 9.5 km for diversion of river water to the power house. The quantum of excavated debris may to the tune of 3 lakh cum. Without proper planned disposal of excavated soil the washed silt content with storm water may adversely impact the river regime. The area being mountainous and forest land a detail plan for tunnel muck disposal may be submitted.

iii) **Disposal plan of Silt /sediment from silt excluder at the entry of tunnel:** There is a provision of silt excluder/extractor at the entry of tunnel within the river to the link channel to tunnel. No detailing of silt load of the river and the quantum of silt to be extracted by the silt excluder & plan of disposal is not elaborated in the presentation. Detailed plan for disposal of the extracted silt through silt extractor with calculation of quantity may be provided.

iv) **Riparian rights of downstream users within the intermediate stretch:** During presentation of satellite imagery, it is observed that patches of agricultural land and small hamlets do exist adjacent to the river. The river seems to be the life line of the inhabitants. It is apprehended that induced flow alteration may impact the rights of the users adversely. It is suggested a details study on the riparian rights of the downstream users and impact of flow alteration on the livelihood of the inhabitants adjacent the intermediate stretch of river may be done and mitigation plan may be incorporated in the report.

v) **Wild life management Plan:** Forest land need to be acquired for the project as presented in the PPT presentation. Project proponent is advised to submit forest diversion proposal at the earliest. A detail wild life management Plan of the study area is to be prepared and submitted to Chief Wildlife Warden for approval.

vi) Study of fish migration and provision of fish ladder may be made & submitted.

vii) **Safety and Disaster Management:** It is advised that the Project proponent should get the safety of the structures vetted (Approved) by appropriated authority and same may be incorporated in the report. A disaster management Plan to be prepared in detail and submitted.

viii) **Hydrogeological impact of the project:** The flow alteration of the definite stretch of river Khadaga and virtual dryness of river in lean months due to flow alteration may adversely affect the ground water table of the adjacent area and livelihood of the inhabitants within the study area. It is recommended that a hydrogeological study of the area with impact due to flow alteration on ground water table may be conducted.

ix) Study report on dam break analysis.

x) Soil erosion stability details.

xi) Analysis on earthquake zone and its classification. Dedicate a portion for it in EIA as a part of DPR.

xii) Possibility for air quality monitoring during operation phase.

xiii) Permission of PCCF for conducting borewell studies.

xiv) The Project clearance could be considered on the ground that the Jurisdiction of The Mahanadi water dispute tribunal (Mahanadi water share of state of Chattisgarh and State of Odisha) does not extend to non-consumptive use of water (diversion of intermediate flow alignment for 9.5 km of river and again release of water without any volume reduction) in the river Basin for power generation. Any future issues could come up, this shall be clarified.

xv) Concrete write-up for the finalised area details and an undertaking that the final document won't undergo any change in future.

xvi) Comparative note on previous and current plan of the project.

xvii) Cumulative Impact of project on carrying capacity and sustainability of Reservoir/ nalahs of catchment area, irrigation facilities due to tapping of water for filling reservoir.

xviii) Alternative sites for various components shall be identified in terms of loss of forest area.

xix) Impact zone decided prior to base line data generation and accordingly, sampling location shall be finalized. Baseline data as mentioned in Standard ToR shall be collected for preparation of EIA/ EMP report along with soil characteristics which shall be studied at minimum 10 locations. The ground water level at 10 locations shall be measured in project area in all three seasons.

xx) A study shall be carried out on impact of project activity on the aquatic and terrestrial ecosystem, within project area classifying the impact zones (highly impact/low impact zone) based on seasonal variations and covering the aspects related to impacts on aquatic ecosystem/ primary productivity due to quantity of water to be lifted for power generation and thermal stratification. Accordingly, Environment Management plan shall be prepared.

xxi) Sampling locations be located to cover villages situated near the reservoir and around boundary of forest area for collection of baseline data and data to be incorporated in EIA/ EMP report.

xxii) Identify the sand mining/ quarrying sites in submergence area and downstream of reservoir.

xxiii) Scope of watershed development in the 10 km radius of the project shall be studied in consultation with expert Govt. institutions/ Indian Council of Agriculture Research (ICAR)and

accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xxiv) Source of construction material and its distance from the project site along with detailed transportation plan for construction material.

xxv) A detailed reclamation/ restoration plan of quarrying site/sites be incorporated in the EIA/EMP report.

xxvi) Reservoir/ River banks protection plan all along the submergence need to be prepared and incorporated in EIA/ EMP.

xxvii) Scope of watershed development in the 10 km radius of the project shall be studied in consultation with Govt. institutions/ Indian Council of Agriculture Research (ICAR) and accordingly a detailed Water Shed Development Plan shall be prepared and incorporated in EIA/ EMP report.

xxviii) MoU for water uses for the project signed and approved by concerned authority shall be submitted.

xxix) Environmental matrix during construction and operational phase needs to be submitted.

xxx) Matrix formulated on the basis of detailed study and field survey of flora and Fauna methodology used shall be mentioned in the EIA report.

xxxi) Endemic plant and animal species found in the area concerned shall be provided instead listing entire endemic species found in the State.

xxxii) Details of Flora and Fauna reported in submergence area, Nos. of tree along with their density and nomenclature of the tree species required to be felled for reservoir creation and other project component.

xxxiii) Impact assessment on the fish diversity based on the hydrological alteration at the water drawing sources shall be studied.

xxxiv) Stage-I Forest Clearance shall be obtained.

xxxv) Explore the possibilities to reduce Forest area for the construction of proposed project, Muck disposal sites should be outside the forest area.

xxxvi) Pre-DPR Chapters viz. Layout Map and Power Potential Studies duly approved by CWC/CEA shall be submitted.

xxxvii) Undertaking need to submitted on affidavit that regarding no activities has been yet started on the project site and water allocated to this scheme shall not be diverted to other purpose.

xxxviii) Both capital and recurring expenditure under EMP shall be submitted.

xxxix) The photograph should bear the date, time, latitude & longitude of the monitoring station/ sampling location. In addition to this PP should submit the original test reports and certificates of the labs which will analyse the samples.

xl) Arial view video of project site shall be recorded and to be submitted.

xli) Detailed plan to restore wider roads and convert them into narrow upto10m after construction of the project.

xlii) Details of quantity of muck generation component wise and disposal site along with transportation plan and its monitoring to be provided.

xliii) Details of Muck Management plan prepared along with estimated cost incorporated in EIA/ EMP report.

xliv) Techno-economic viability of the project must be recommended from CEA/ CWC.

xlv) Declaration by the project proponent by way of affidavit that "No" Inter-state issue/ policy issue is involved with any State in the project.

xlvi) All the tasks including conducting public hearing shall be done as per the provisions of EIA Notification, 2006 and as amended from time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/ EMP report in the relevant chapter.

xlvii) Statement on the commitments (activity-wise) made during public hearing to facilitate the discussion on the CER in compliance of the Ministry's OM F.No.22- 65/2017- IA.III dated 30th September, 2020 shall be submitted.

xlviii) Tentative no. of project affected families shall be identified and accordingly appropriate Rehabilitation & Resettlement plan shall be prepared.

xlix) Details of settlement in 10 km area shall be submitted.

l) Application to obtain prior approval of Central Government under the Forest (Conservation) Act. 1980 for diversion of forestland required should be submitted as soon as the actual extent of forest land required for the project is known, and in any case, within six months of issuance of this letter.

li) The draft EIA/EMP report prepared as per the Generic Structure (Appendix III of EIA Notification, 2006) incorporating, information as per the Standard ToR, should be submitted to the Stale Pollution Control Board for conducting Public Consultation as per the provisions stipulated in EIA Notification, 2006. Public Hearing, which is a part of Public Consultation, shall be held district wise at the site or in its close proximity as prescribed in Appendix (IV) of EIA Notification, 2006. The draft EIA/EMP report is to be submitted to SPCB sufficient before the expiry of the ToR validity so that necessary amendments in EIA/EMP can be undertaken based on public hearing and the same is to be submitted to MoEF&CC before expiry of validity of ToR.

lii) All the tasks including conducting public hearing shall be done as per the provisions of Notification, 2006 and as amended time to time. Public hearing issues raised and compliance of the same shall be incorporated in the EIA/EMP report in the relevant chapter

liii) Baseline data and public consultation shall not be older than 3 years, at the time of submission of the proposal, for grant of Environmental Clearance.

liv) In case of any change in the scope of the project such as capacity enhancement, change in submergence, etc.. fresh scoping clearance has to be obtained.

ITEM NO. 02

PROPOSAL OF ENVIRONMENTAL CLEARANCE OF M/S TATA STEEL MINING LIMITED FOR GANDHALPADA IRON ORE MINE OF PRODUCTION CAPACITY 10 MTPA (ROM) WITH TOTAL EXCAVATION OF 18.0 MTPA (ML AREA 241.10 HA) LOCATED AT GANDHALPADA, GUALI AND BARPADA VILLAGES, BARBIL TEHSIL, KEONJHAR DISTRICT OF SRI PANKAJ KUMAR - 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. **Category**: As per EIA Notification, 2006 and its subsequent amendments, the proposed project falls in category B under schedule of item 1(a)-Mining of minerals.
3. This proposal is for Terms of Reference for obtaining Environmental Clearance of M/s Tata Steel Mining Limited for Gandhalpada Iron Ore Mine of production capacity 10 MTPA (ROM) with Total Excavation of 18.0 MTPA (ML Area 241.10 ha) Located at Gandhalpada, Guali and Barpada Villages, Barbil Tehsil, Keonjhar District of Sri Pankaj.
4. **Letter of intent**: Government of Odisha, pursuant to the Mines and Minerals (Development & Regulation) Act, 1957 and the Mineral (Auction) Rules, 2015, issued the notice inviting tender dated 7 th July 2021 to commence the auction process for grant of mining lease for Gandhalpada Iron Ore Block located in Keonjhar District of Odisha. The second round of e-auction process was conducted on 22nd Sep 2021 in accordance with the tender document for the said mineral block and Tata Steel Mining Limited (TSML) was declared as the "Preferred Bidder" under Rules 9(4)(b)(iii) of the Mineral Auction Rules, 2015 vide Government of Odisha, Dept. of Steel & Mines, Letter No. MXIII(b)/45/2021/7489/ DM, dtd.25th Sep, 2021. Subsequently, as per Rule 10(1) of Mineral Auction Rules, TSML made payment towards first instalment of upfront payment of Rs 122.41 Crores, dated 16th Oct 2021. Accordingly, pursuant to rule 10(2) of Mineral Auction Rules 2015, Government of Odisha has issued letter of intent (LOI) vide letter no 8728/III(A)/SM-02/2021 dated 28th Oct 2021 for grant of Mining Lease for Gandhalpada Iron Ore block over a period of 50 years to M/S Tata Steel Mining Limited.
5. **Project details**: The proposed mine lease area measuring 241.10 ha is for extraction of Iron Ore. The annual excavation is targeted at 10 MTPA (RoM) corresponding to saleable iron ore. Open cast mechanized mining method is proposed. The ROM will be fed to a crushing/screening plant. The lump ore and fines will be segregated in the Crushing / Screening plant. The proposed use of mineral is for Captive use in Own Industry and for Direct selling to Domestic market.
6. **Statutory clearances**:

Sr.No	Activity	Date
1	Award of Iron Ore Block under Rules 9(4)(b)(iii) of the Mineral Auction Rules, 2015 vide Government of Odisha, Dept. of Steel & Mines, Letter No. MXIII (b)/45/2021/7489/ DM,	28th September 2021
2	TSML made payment towards first installment of upfront payment of Rs 122.41 Crores	14th October 2021

3	Government of Odisha has issued letter of intent (LOI) vide letter no III(A)/SM-02/2021	28th October 2021
Statutory Clearances		
1	Approval of Mining Plan along with Progressive Mine Closure Plan (PMCP) vide Letter No: BBS/KJR/IRON/2198/MP/2022-23	23rd February 2023
2	Submission of Application for Stage-I Forest Clearance for entire forest land 216.875 ha vide Proposal No: FP/OR/MIN/QRY/432630/2023	08th June 2023

7. **Location and connectivity:** Gandhalpada Iron Ore Mine of M/s Tata Steel Mining Limited having lease area 241.10 hectares is situated in three villages namely Gandhalpada, Barpada & Guali of Keonjhar Districts, of State Odisha bounded by Latitude: 21°57′13.46″ N to 21°58′21.194″ N and Longitude: 85°16′44.658″ E to 85°18′00.507″ E in Toposheet no T73/G5. The mine is well connected by NH-215, which is about 0.80 km in NW. Nearest Railway Station is Jaroli which is about 12.60 Km in E direction. Rourkela Airport at 57 Km NW, Jharsuguda Airport 126.7 km W and Biju Patnaik International Airport, Bhubaneswar is about 196 Km in SSE direction from the project site. The nearest town is Barbil located at a distance of about 17.42 km from the lease area.
8. **Topography and drainage:** The highest and lowest topographic elevations of the study area are 868 m above mean sea level (amsl) along Karo Nadi in the north and 530m amsl on Jhandi Buru covered by Uliburu/Karo RF near Dalmakudar in the NNW. The general slope in the study area is towards north-east. The ML area has moderately undulating terrain in the west to hilly topography in the north, east and south. The drainage pattern in the study area is dendritic to sub-trellis in nature having a drainage density of 2.82 m/sq km. River Sona is a perennial river flowing from South to North at a distance of 3 km in the South-East and it becomes West-East from Malda and finally meets into river Baitarani. River Karo is a perennial river flowing from South to North at a distance of 2 km in the West
9. **Land use details**:

Sl.	Particular	Area put to use at start of year (Ha)			Area put on use at end of plan period (Ha)			Area to be used by the end of Conceptual period (Ha)		
		Forest	Non-Forest	Total	Forest	Non-Forest	Total	Forest	Non-Forest	Total
1	Area under Mining	0	0	0	102.44	0.54	102.98	215.29	22.95	238.24
2	Topsoil stacking	0	0	0	1.43	0.07	1.5	0	0	0
3	Overburden/Waste Dumping	0	0	0	32.97	1.91	34.88	0	0	0
4	Mineral Storage	0	0	0	21.35	10.22	31.57	0	0	0

5	Infrastructure (Workshop, Administrative Building etc.)	0	0	0	2.73	5.55	8.28	0	0	0
6	Roads	1.42	0.83	2.25	21.22	1.58	22.8	0	0	0
7	Railways	0	0	0	0	0	0	0	0	0
8	Tailing Pond	0	0	0	0	0	0	0	0	0
9	Effluent Treatment Plant	0	0	0	0.05	0	0.05	0	0	0
10	Mineral Separation Plant	0	0	0	3.58	2.16	5.74	0	0	0
11	Township Area	0	0	0	0	0	0	0	0	0
12	Others (Safety Zone) *	0	0	0	4.15	0.69	4.84	4.84		4.84
13	Others (Existing Road, Buildings, Streams)*	0.41	0.26	0.67	0.41	0.26	0.67	8.58	0.05	8.63
14	Others (Utility Corridor)	0	0	0	2.18	0.7	2.88	2.11	0.75	2.86
	Total	**1.83**	**1.09**	**2.25**	**192.51**	**23.68**	**216.19**	**217.4**	**23.7**	**241.1**

10. **Reserves:** Geological reserves, probable mineable reserves and blocked reserve is 314.372 million ton, 288.629 million ton and 25.74 million ton respectively.

Classification	**Code**	**Quantity (Million Tonnes)**			**Grade**	
		Forest	**Non-Forest**	**Total**	**Forest**	**Non Forest**
A. Mineral Reserve						
Probable Mineral Reserves	**122**	**266.63**	**22.00**	**288.63**	**Fe >= 55%**	**Fe >= 55%**
B. Remaining Resources						
Prefeasibility Mineral Resource	**222**	**12.22**	**13.52**	**25.74**	**Fe >= 55%**	**Fe >= 55%**
Total Mineral Resources (A+B)		**278.85**	**35.52**	**314.37**	**Fe >= 55%**	**Fe >= 55%**

11. Year wise production:

Sl No.	Year	Total Handling (T)	Waste Quantity (T)	ROM Quantity (T)	ROM Qty Saleable Mineral (T)	ROM Qty Mineral Reject (T)	OB to Ore Ratio (OB Qty/ ROM Qty)	Grade Range (%)
1	Year 1	3200000	200000	3000000	3000000	0	0.07	Fe>45%
2	Year 2	6500000	1500000	5000000	5000000	0	0.30	Fe>45%
3	Year 3	8200000	200000	8000000	8000000	0	0.03	Fe>45%
4	Year 4	13000000	3000000	10000000	10000000	0	0.30	Fe>45%
5	Year 5	18000000	8000000	10000000	10000000	0	0.80	Fe>45%

12. **Method of Mining:** The area has remained completely virgin so far and no mining operation was carried out in the past. In consideration of the targeted production level, Gandhalpada iron Ore mine is proposed to operate through Open cast mining with mechanized means, deep hole drilling & blasting followed by shovel dumper combination has been proposed for loading and transportation of the ROM and Waste. Long term mining plan has been made to achieve production of Iron Ore @ 10 MTPA ROM. Currently, the production plan has been made based on the G2 level exploratory data (done by GSI), however, the exploration will be done at G1 level in the phased manner, subsequent to grant of mining lease and after obtaining statutory clearances. Ore will be transported in dumpers to crusher while waste will be transported in dumpers to the earmarked backfilling area/external dump. Due to absence of non-mineralized area (since the entire lease area is covered within ultimate pit), long term mining sequence has been developed to enable space for backfilling. A maximum bench height of 10m will be maintained across the entire pit. In Gandhalpada auction block, the ore is mostly powdery to soft laminated varieties (FINES) with partings of ferruginous shale. Thin layer of Hard Laminated Ore (HLO) (LUMPS) is present on the surface, followed by powdery and soft laminated ore at depth, which are inseparable during dry drilling in most of the cases. In eastern part of the block the ore is mostly powdery to soft laminated varieties with partings of ferruginous shale as intersected in almost all the boreholes. However, an attempt has been made to demarcate the HLO horizon separately wherever considerable thick HLO zone is intersected in the borehole. It is to mention that 4.80m, 14.50m and 23.00m thick hard laminated ore has been intersected at 23.60mbgl, 6.70mbgl and 4.00mbgl (metre below ground level) in borehole OKGB-2, OKGB-11 and OKGB-20 respectively. Life of the mine is 33 years.

13. **Drilling & Blasting**: Drilling and blasting will be required for loosening of the rock mass for ease in excavation. Controlled blasting technique will be adopted to minimize the ground vibration and to avoid flying of rocks. During the blasting, in case of formation of a large boulder, rock breaker will be used for breaking the same to avoid secondary blasting. Drilling will be carried out using 150 mm dia with 3.78 m burden & 5.06 m spacing based on the geological rock characteristics. Considering the disposition of the ore body, it has been estimated that about 80 % (approx.) of planned quantity will require drilling & blasting. Holes will be charged with slurry/emulsion explosives and initiated using electric delay detonators/detonating fuse/NONEL.

Bench Height	10m
Working Bench Width	12m
Ultimate Bench Width	10m
Ultimate Pit Slope	37°
Bench Slope	72°

14. **Loading & transportation:** Blasted material will be loaded with hydraulic excavators of bucket capacity of 2.0 to 5.90 m^3 into dumpers and will be transported to a proposed crushing & screening plant for production of lump & fines. Dumpers of 15/25T capacity would be utilized for shifting of crushed ore to the stack-yard. Marketable ore will be despatched by road through trucks of different capacities and rail. Waste generated will be transported to proposed waste dump.

15. **Waste generation and management:** The iron ore deposits of the area are associated with BHJ, Laterite, lateritic soil and shale. These will be generated from the lease area as waste with iron ore. About 15820 m^3 of top-soil will be generated in the ensuing plan period of 5 years. Total waste generation will be around 145 Million Tonnes at conceptual stage. Due to lack of non-mineralized area, all the waste generated in the current mining plan period will be dumped in temporary waste dump 1, along the southern part of the lease. However, in future, waste generated will be backfilled in the mined-out pits. Total space available for backfilling in stages will be around 50 Million cum, this space will be available in phases. Till such time, waste will be dumped in the temporary waste dump 1 which will be re-handled in future. The proposed temporary waste dump 1 which has been planned upto 580 mRL in the current mining plan period will be further raised upto 610 mRL at the conceptual stage with overall dump height of 80 m. Toe wall and garland drains will be maintained along the dump to avoid any surface run -off. Overall dump slope will be kept below 28°. As the dump is temporary in nature, stabilization of dump will be done through coir matting and vetiver/equivalent grass.

Sl. No.	Year	Dump Id	Type of Dump	Proposed Area (ha)	Height (m)	Total Dump Quantity (m^3)
1	Year 1	Temporary Waste dump 1	External Dump	14.96	8m (upto 538 mRL)	10000
2	Year 2	Temporary Waste dump 1	External Dump	14.96	20m (Two	75000

					Stages) (upto 550 mRL)	
3	Year 3	Temporary Waste dump 1	External Dump	14.96	20m (Two Stages) (upto 550 mRL)	10000
4	Year 4	Temporary Waste dump 1	External Dump	32.93	30m (upto 560 mRL)	1500000
5	Year 5	Temporary Waste dump 1	External Dump	32.93	50m (upto 580 mRL)	4000000

16. **Water Requirement**: The demand of water for the project has been estimated as per industrial norms. Around 1600 KLD of surface water sourced from Suna River will be used for the mines for water sprinkling and plantation purpose. It is envisaged that to meet the requirement of water for drinking and domestic purpose, a tune of 200 KLD will be met from ground water. After that mine quarry will collect sufficient water which will meet the industrial demand. However, the potable water demand at mine, mine facilities will be met through ground water by bore wells. Water Demand at Gandhalpada Iron Ore Mine includes water requirement for sprinkling at mine haul roads, service water requirement for dust suppression system, water requirement for Base Work Shop & other miscellaneous purposes. Overall water requirement is 1800 KLD for the mine operations.

17. **Power Requirement:** The total electricity requirement has been estimated to be 10 MW and will be sourced from CESU, Odisha. The electricity will be used mainly in illumination as well as operating processing plant and office building along with other infrastructure area. Around 2% - 5% of power will be sourced by renewable energy means (Solar power). Solar power majorly will be used for streetlight and solar panel in the mine's office will be erected. Six nos. of DG set with 500 KVA capacity has been proposed for standby backup

18. **Transportation of Ore to End user:** Transportation of ore outside the mining lease has been proposed through road/rail transportation at the initial stage. A separate road inside the lease upto the loading point will be maintained for safe transportation of ore. Exit road of 0.8 km from the mine lease will be developed to connect NH 520. Trucks carrying ore outside the lease will be 100% covered by tarpaulin to avoid dust emission along the exit road. Moreover, dust suppression outside the lease upto NH 520 will be done at regular intervals to minimize dust generation during road transport. However, to meet the SOTM (Suggested ore transportation mode) as per NEERI recommendations, there is proposal to lay slurry pipeline for transportation of ore upto end customer. The current study has been done for dispatch of product in the form of slurry through slurry pipeline. The study for the slurry pipeline has been done for 7 MTPA capacity (Phase I) ~3.0 MTPA for Kalamang West (Northern Part) and 4.0 MTPA for Gandhalpada Mine. In Phase II the capacity will be augmented to 13.0 MTPA or more to meet the requirement of both Kalamang, Gandhalpada & upcoming mine in the region. In the initial phase

the product from Gandhalpada Iron Mine will be conveyed through dump trucks to the wet grinding facility at Kalamang and further dispatch through slurry pipeline. In future a utility corridor has also been proposed for this purpose, within the Gandhalpada lease.

19. **Green Belt:** Total area proposed for safety zone for initial 5 years would be 4.84 ha and width of the greenbelt along the boundary of project activity is 7.5 m. At the conceptual stage 95.23% of total area will be covered under Plantation. About 12,100 saplings will be planted at initial 5 years for safety zone with fund allocation of Rs 48,40,000.

20. **Employment potential:** The production of mineral will benefit the State in the form of royalty and dead rent. Apart from this, the project will generate direct and indirect employment to the tune of about 575 persons as well as priority for indirect employment opportunity will be given to nearby villages.

21. **Project cost**: The cost of the project is Rs.731.06 Crore. EMP cost is 58.48 Crore (8%)

Table: Project cost

Sr.No	Activities	Rs in Crores
1	Land Acquisition, Alienation and R&R	126.14
2	Pre-Mining Approvals and Clearances	
a	Forest Clearance	106.62
b	Environment Clearance	5.11
c	Consent to Operate	0.8
d	Water Drawl Permission	0.04
3	Lease Deed Execution	422.94
4	Enabling Infrastructure Facility	8.99
5	Post Mining Exploration	18.51
6	Power Supply & Illumination	3.83
7	Public Hearing Commitment	3.27
	Total Cost-Net of GST	**696.25**
	Contingency@ 5%	**34.81**
	Total Cost (Net of GST With Contingency)	**731.06**

Table: CSR COST

CSR INTERVENTIONS	ACTUAL EXPENDITURE (Rs)
Solar Powered Drinking Water Project	1,05,08,000.00

CSR INTERVENTIONS	ACTUAL EXPENDITURE (Rs)
Development of Rainwater Harvesting Ponds	29,60,000.00
Public Health (Doctors, Medicine and MMU)	23,12,000.00
Agriculture & Sustainable Livelihood	12,89,000.00
Education (School Infrastructure, Skill Development)	42,01,000.00
Solar Light Program	25,00,000.00
Ethnicity to promote tribal culture	11,00,000.00
Sports infrastructure and training	5,00,000.00
Rural Infrastructure development	36,00,000.00
Total Expenditure (Rs)	**2,89,70,000.00**

22. **Environment Consultant**: The Environment consultant **M/s Vimta Labs Ltd., Hyderabad** along with the proponent made a presentation on the proposal before the Committee. The project proponent has intimated that they have already collected baseline data during October 2022 to December 2022.

Considering the information / documents furnished by the proponent and presentation made by the consultant **M/s Vimta Labs Ltd., Hyderabad**, the SEAC prescribed the following specific ToRs in addition to standard ToRs as per **Annexure – B** for conducting detailed EIA study.

i) Site specific conservation plan with emphasis on Karo-Karampada Elephant Corridor / Elephant movement areas with due approval of Chief Wildlife Warden.

ii) Any forest land required outside the lease area for use of transportation route, if so, detailed status of diversion of such forest land is to be submitted.

iii) Details of existing mines and their operational status within 10 kms radius is to be submitted.

iv) The following information to be submitted.

a) Compliance of mining plan, including waste and OB dump management, mine closure plan etc.

b) Compliance to Common cause judgment

c) Status of R&R

d) Compliance of plantation

e) Compliance of public hearing issues

f) Status of complaints/ court cases/legal action

g) Any other relevant environmental issue / parameter.

h) The following studies be undertaken by domain experts, viz:

- Blast vibration study if feasible with trial blasts
- Socio economic study of the neighbouring habitation
- Biodiversity study (with special emphasis on RET and endemic species) with audit mechanism.
- Slope stability study for both mines and OB /waste dumps.
- Surface runoff management along with rainwater harvesting and ground water recharge include the design of drainage structures.
- Traffic density study, both inside the mines and at haulage roads, intersecting points of haulage road with public road.
- Hydrology study: The study findings and the mitigation measures thereof to be submitted

v) RL of ground water during summer and rainy season along with RL of the ground post mining as per the approved mining plan to be reported.

vi) Report the contents of chromium, manganese, and other heavy metal elements such as vanadium, mercury etc. in the ground water samples of the study area.

vii) Cost of the CER calculated shall be utilized for the concerns of the people in terms of health, education, and infrastructure and environment protection. Project Proponent also shall include the budget for the betterment of schools nearby and to facilitate the online education system by providing Wi-Fi connectivity and desktops/tablets.

viii) The project proponent should provide in the EIA Report details of all the statutory clearances, permissions, no objection certificates, consents etc. required for this project under various Acts, Rules and regulations and their status or estimated timeline after grant of EC.

ix) The project proponent should submit the revenue plan for mining lease, revenue plan should be imposed on the satellite imaginary clearly demarcate the Govt. land, private land, agricultural land etc.

x) The project proponent should submit the real-time aerial footage & video of the mining lease area and of the transportation route. The project proponent should submit the detailed plan in tabular format (year-wise for life of mine) for afforestation and green belt development in and around the mining lease. The project proponent should submit the number of saplings to be planted, area to be covered under afforestation & green belt, location of plantation, target for survival rate and budget earmarked for the afforestation & green belt development. In addition to this the project proponent should show on a surface plan (5-year interval for life of mine) of suitable scale the area to be covered under afforestation & green belt clearly mentioning the latitude and longitude of the area to be covered during each 5 years. The capital and recurring expenditure to be incurred needs to be submitted. Presently in India there are many agencies which are developing forest in

short interval of time. Thus, for the plantation activities details of the experts/agencies to be engaged needs to be provided with budgetary provisions.

xi) The project proponent should submit the quantity of surface or ground water to be used for this project. The complete water balance cycle needs to be submitted. In addition to this PP should submit a detailed plan for rain water harvesting measures to be taken. PP should submit the year wise target for reduction in consumption of the ground/surface water by developing alternative source of water through rain water harvesting measures. The capital and recurring expenditure to be incurred needs to be submitted.

xii) The project proponent should clearly bring out the details of the manpower to be engaged for this project with their roles /responsibilities/designations. In addition to this the project proponent should mention the number and designation of person to be engaged for implementation of environmental management plan (EMP). The capital and recurring expenditure to be incurred needs to be submitted.

xiii) The project proponent should submit the year-wise, activity wise and time bound budget earmarked for EMP, occupational health surveillance & Corporate Environmental Responsibility. The capital and recurring expenditure to be incurred needs to be submitted.

xiv) The project proponent should submit the measures/technology to be adopted for prevention of illegal mining and pilferage of mineral. The project proponent should submit the detailed mineralogical and chemical composition of the mineral and percentage of free silica from a NABL/MoEF&CC accredited laboratory.

xv) The project proponent should clearly show the transport route of the mineral and protection and mitigative measure to be adopted while transportation of the mineral. The impact from the center line of the road on either side should be clearly brought out supported with the line source modelling and isopleth. Further, frequency of testing of Poly Achromatic Hydrocarbon needs to be submitted along with budget. Based on the above study the compensation to be paid in the event of damage to the crop and land on the either side of the road needs to be mentioned. The project proponent should provide the source of equations used and complete calculations for computing the emission rate from the various sources.

xvi) The project proponent should clearly bring out that what is the specific diesel consumption and steps to be taken for reduction of the same. Year-wise target for reduction in the specific diesel consumption needs to be submitted.

xvii) The project proponent should bring out the awareness campaign to be carried out on various environmental issues, practical training facility to be provided to the environmental engineer/diploma holders, mining engineer/diploma holders, geologists, and other trades related to mining operations. Target for the same needs to be submitted.

xviii) The budget to be earmarked for the various activities shall be decided after perusal of the Standard EC conditions. After perusal of Standard EC conditions if agreed the project proponent should also submit an undertaking by the way of affidavit for Compliance of Standard EC conditions already prescribed by the Ministry vide O.M. No and Specific condition if prescribed by the SEAC/SEIAA, Odisha.

xix) The project proponent should ensure that only NABET accredited consultant shall be engaged for the preparation of EIA/EMP Reports. The project proponent shall ensure that accreditation of consultant shall be valid during the collection of baseline date, preparation of EIA/EMP report and during the appraisal process. The project proponent and consultant should submit an undertaking the information and data provided in the EIA Report and submitted to the SEIAA, Odisha are factually correct and the project proponent and consultant are fully accountable for the same.

xx) The project proponent should submit the photograph of monitoring stations & sampling locations. The photograph should bear the date, time, latitude & longitude of the monitoring station/sampling location. In addition to this the project proponent should submit the original test reports and certificates of the labs which will analyze the samples.

xxi) The percentage of iron in the final waste generated and not used as iron ore or its upgradation.

xxii) Compliance to NEERI recommendations.

xxiii) "Zero discharge" management & "Zero Dust Re-suppression" management with SOP be submitted.

xxiv) Internal roads, drain management with network of the drain, retaining walls and settling tanks with ETPs be submitted.

xxv) Details of air quality monitoring stations of the area and additional stations at entry and exit of mines and haulage roads, habitation to be considered.

xxvi) Construction and perennial maintenance of haulage road with details of plantation and the species thereof to be submitted.

xxvii) Parking plaza layout with maximum no. of vehicles and types of vehicles that can be parked with basic amenities and facilities.

xxviii) Forest Clearance details with copy of all Forest Clearance.

xxix) Status of complaints/ court cases/legal action regarding to lease along with a detailed write up indicating case no., purpose of the case etc.

xxx) Copy of lease document.

xxxi) Details of waste management i.e. composition and nature of waste generated, tabulated form showing year wise waste generation, usage and storage.

xxxii) Project Proponent shall consider developing a good nursery in nearby village for production of saplings of 4-6 feet height for planting in safety zone, sides of external haulage roads and distribution among villagers for planting in their private land/ community land. The nursery may be developed by company on their own or in collaboration with forest department. A detailed proposal to this effect shall be submitted. The proponent shall ensure to use organic fertilizer in the nursery.

xxxiii) Comprehensive water management, water balance with water harvesting and its reuse both monsoon and non-monsoon period.

xxxiv) STP plan with design with location in the layout map for domestic waste water

treatment.

xxxv) Provision of solar power (percentage wise) with detail plan.

xxxvi) To submit the network with dimension of concrete cement roads inside the mining lease area and haulage road.

xxxvii) To submit parking plaza at entry and exit of the mines with basic amenities.

xxxviii) Plan and SoP to be submitted for water sprinkling inside the mines and outside in haulage road including regular vacuum cleaning and Zero Dust Resuspension system to completely mitigate and arrest fugitive dust emission.

xxxix) Wagon drill blasting must be avoided- to confirm.

xl) Details of grade of Fe to be mined, cutoff grade, management of off grade, quantity of each year wise and the dumping or storage plan of off grade and wastes to be provided.

xli) Total water management including domestic use w.r.t sourcing from borewell, rain water harvesting and recycling of waste water from ETP/STP, both for monsoon and non-monsoon be submitted.

xlii) Measures to be taken for arresting and mitigation of occupational health hazard including identification of the same, both for employees and nearby/surrounding habitation.

xliii) Year wise waste/OB management with reference to generation and utilization in consideration with dynamic movement of inventory indicating dump area and dimension of storage be submitted.

xliv) Details of grades to be produced, to be discarded as waste and dumps and the utilisation plan.

xlv) Details of Trees falling.

xlvi) The road to which the approach road of 3.5 kms as stated to be connected?

xlvii) Permission/ NOC from CGWA as a contingency measure in case of intersection with ground water and the corresponding Disaster Management plan.

xlviii) Details of plan and calculation of consumption of solar power including for water sprinkling vis - a - vis the generation and as percentage of total power demand.

xlix) Site specific wild Life management plan including protection and conservation of Endangered, Threatened and Near Threatened living species along with their categories be identified and submitted with due approval of Chief Wildlife Warden.

l) Rain water Harvesting Pond (s) details with design.

li) Provision of suitable size of sump be planned in the second review of Mining Plan period prior to backfilling of Mined out area. The sump will be beneficial for the storage of water for use of Mines and recharge of groundwater Aquifer.

lii) The proposed land is a forest land. The lease area is covered with 35,000 trees. The PP need to submit concrete plan for how many trees can be transplanted in safety zone and how many trees shall be cut.

liii) Detail water management plan in the EIA/EMP study as there is provision for transportation of final product in slurry form.

liv) Ore/heavy metal analysis correlated with the elemental content of the baseline study to be submitted.

ITEM NO. 03

PROPOSAL OF ENVIRONMENTAL CLEARANCE OF BHUBANESWAR DEVELOPMENT AUTHORITY FOR CONSTRUCTION OF B+S+9 STORIED COMMERCIAL/ RESIDENTIAL APARTMENT CONSTRUCTION WITH BUILT-UP AREA FOR THE PROJECT WAS 17923 SQ.M. AT PRESENT WITH PARKING AREA OF 7477 SQ.M THE TOTAL BUILTUP AREA IS NOW 25400 SQ.M I.E > 20,000 SQ.M AT BHAGABANPUR MOUZA, BHUBANESWAR, KHORDHA OF SRI LOKANATH PRASAD MOHAPATRA – EC (VIOLATION CASE)

1. This proposal is for Environmental Clearance of Bhubaneswar Development Authority for Construction of B+S+9 storied commercial/ residential apartment construction with built-up area for the project was 17923 Sq.m. At present with parking area of 7477 Sq.m the total builtup area is now 25400 Sq.m i.e > 20,000 Sq.m at Bhagabanpur Mouza, Bhubaneswar, Khordha of Sri Lokanath Prasad Mohapatra.
2. **Category**: This project falls under Category "B", Project or Activity 8(a) Building and Construction projects as per EIA Notification dated 14th Sep, 2006 as its amendments.
3. **Project details**: BDA was constituted on 1st Sept, 1983 under provisions of ODA Act, 1982. Initially, 115 revenue villages of Bhubaneswar, Khordha and Jatni were taken into its jurisdiction, but due to bifurcation and inclusion of new villages, at present the number of villages under its jurisdiction stands at 556.The construction project of B+S+9 storied commercial and residential apartment is spread over about 1.48 acres of land, the construction project is for commercial and residential purpose. Total built-up area of the project is 25400 sq.m with parking area of 7477 Sq.m. Green area allocated for the project is 600 sq.m. The project will create commercial facility in the ground and first floor of the project site, parking in the basement and stilt and 7 floors for residential purpose. There will be 70 nos of residential apartments in the project. The construction work for the project has been carried out by Bhubaneswar Development authority as the initial built-up area for the project was 17923 Sq.m. However, after the completion of the project, there was the requirement of parking area of 6500 Sq.m. Looking to the additional requirement of parking as the project include commercial space, BDA allocated an area of 7477 Sq.m of the area for parking purpose, leading to total built up area 25400 Sq.m.
4. **Violation justification**: As the built-up area is now greater than 20,000 Sq.m, Environment clearance is required for the project as per EIA Notification, 14th September 2006, and subsequent amendments. As the construction of the project has been completed, the project is coming under violation to EIA Notification 2006. Violation ToR was issued for EIA Study by the SEIAA, Odisha vide file no. SIA/OR/INFRA2/414838/2023, dated 28.04.2023.
5. Land has been allocated by Odisha State Govt. to Bhubaneswar Development Authority for Developmental purpose.
6. **Location and connectivity**: The proposed project includes the Plot area of 1.48 Acres with built-up area: 25400 Sqm and located on Khata No. 683/1, Plot No: 86, 193, 347/2415, 1046/1480, 83/1680; Kissam – Gharabari, Mouza – Bhagabanpur, Bhubaneswar, Odisha. The area is located

in Survey of India Toposheet No. 73 H/11. The project site is connected by NH16 road and located near DN Regelia mall.The site is surrounded by 30m wide approach road towards south and NH 5 on the north direction. BDA has already taken up residential and commercial projects at Kalinga Nagar.

7. **Topography and drainage**: The area for the construction project is in alignment with the surrounding developmental plan of Bhubaneswar. The nearby area is being used for construction of building; apartments used for residential purposes. So the existing land use pattern of the area will not significantly change due to the construction of "Bhubaneswar Development Authority – Bhubaneswar. The drainage of the district is mainly controlled by rivers like The Mahanadi, Kuakhai, Kushabhadra, Daya, Ran, Kalijiri, Sulia, Kharia & the Kusumi. Being a coastal district the river basins are much wider and the sand sources are very much suitable for construction purposes. There is no natural drainage system passing through the project area.

8. **Area details**:

Sl. No	**Building Name**	**Stories**	**No. of Dwelling units**	**Built up area in Sq.m**
1.	Basement + Stilt for parking	2	--	7477 Sq.m
2.	Ground + 1st Floor (Commercial)	2	--	5620 Sq.m
3.	2nd Floor – 8th Floor (Residential)	7	70	12303.2 Sq.m
Total Built up area				25400 Sq.m
Total Green area				600 Sq.m (10%)
FAR achieved				2.99
Permissible FAR as per the local bye laws - 2.25 Achieved FAR as per the Master Plan - 2.99 Max Built up area achieved - 87756.41 Sq.m Max Ground Coverage permissible - 40% Ground coverage achieved as per Master Plan - 37%				

9. Baseline study:

PERIOD	**April 2023**
AAQ Monitoring result	PM 10 – 64.7 to 78.6 µg/cu.m; PM2.5 – 35.6 to 43.2 µg/cu.m SO2 – 6.5 – 12.8 µg/cu.m; Nox – 14.4 to 21.5
Ground water Quality at 6 Location	pH- 7.2 – 7.3 Total Hardness – 140-160 mg/l ,, Fluorides – 0.3 to 0.35 mg/l, TDS – 0.5 – 0.8 mg/l, Iron – 04 to 0.8 mg/l; Heavy metals (Cd <0.001, Hg<0.0005, As<0.001)
Surface water at 4 locations	pH –7.0 to 7. 2, DO- 5.8 to 6.1mg/l, BOD- 1.8- 2.5 mg/l, COD 8 to 15 mg/l, Chloride – 20 to 40 mg/lHeavy metals (Cd <0.001, Hg<0.001, As<0.01)
Noise level at 7 locations	In the project site the daytime noise level is 51.0 dB (A) and the night time noise level is 39.6. The maximum noise level is 53.3 dB (A) during the day time and maximum noise level is 46.5 dB (A) during the night time at Patrapada area.

Soil Quality at 5 locations	pH: 5.4-6.1; Organic Carbon content is moderate to high (0.56 to 0.98%) Nitrogen (N) is Low (176-213 Kg/Ha), Available phosphorus content (28.5 to 33.8 kg/Ha), Available potassium low (84.7-104.8 Kg/Ha). Soil analysis result shows that soils are moderately leached, acidic in reaction, low in available nitrogen content and high in phosphorus content & potassium content. The soil of the area is found to have low fertility.

10. **Power requirement**: Total electricity requirement for the buildings will be 1597 KW which will be supplied by the central Electricity supply Utility, Bhubaneswar Odisha. Out of the total power requirement ,2x40 KW will be from solar energy and other 1517 KW will be sourced from CESU, Bhubaneswar. Two nos. of D.G set of 380 kVA has been installed for emergency power back up in the housing complex.
11. **Solar power generation:** Out of the total energy consumption 5% i.e. 80 KW will be fed from Solar energy. No of Solar panels to be installed are 125 nos. Size of solar panel is 2m x 1 m. Area required for installation of roof top solar panel is 250 sq.m.
12. **Water requirement**: Total water requirement for the housing complex will be 100 KLD out of which 70 KLD will be required for domestic purpose and 30 KLD will be required for flushing purpose. Dual plumbing system will be adopted in the buildings. 30 KLD of water required for flushing will be the STP treated water and the fresh water requirement will be 70 KLD.

l. o.	Description	Total Population	Fresh Water Requirement					Water Flow To STP					
			Flushing (recycled water)		Domestic (Fresh Water)		Gross Water	Flushing		Domestic			Total
			LPCD	LPD	LPCD	LPD	LPD	%	LPD	%		LPD	LPD
Domestic Water													
1	Housing complex	350	45	15750	90	31500	47250		100	15750	85	26775	42525
2	Commercial area (Floating population)	200	45	9000	90	18000	27000		100	9000	85	15300	24300
2	Commercial area (Fixed population)	200	--	--	55	11000	11000				85	9350	9350
2	Misc.	100	45	4500	90	9000	13500		100	4500	85	7650	12150
Total				29250		69500	98750			29250		59075	88325
Lpd: Litres Per Day													
Lpcd: Litres Per Capita Per Day													

Total water requirement for the project will be 100 KLD, Out of which 70 KLD will be fresh water required for domestic purpose, 30 KLD will be STP treated water used for flushing and another 30 KLD of STP treated water will be used for gardening purpose
Water will be sourced from PHED

13. **Wastewater generation and management**: About 90 KLD of waste water will be generated from the housing complex and community hall. There is the proposal of establishment of 100 KLD STP.
14. **Rainwater harvesting details**: There is the proposal for rain water harvesting within the project site. The project will create 6 nos of rain water recharge pit with 6m x4.5mx1.5m capacity.
15. **Solid-waste generation and management**: About 215 Kg of solid waste will be generated from the propose group housing project which include bio degradable and non biodegradable waste. The recyclable material like thermocol, cartoon boxes, newspaper waste is given back to suppliers for recycling. The non bio degradable waste will be disposed through BMC and the Biodegradable waste will be utilized for composting. The sludge generated from the STP (10 Kg approx.) will be dried in sludge drying yard and used as fertilizer for the plants within the project site.

Generation of solid Waste			
Total Floating Population as calculated in water balance table		400	nos
25% of the floating population=		100	nos
Total paved area street sweeping		300	sqm
NBC Standard			
Type of User	Kg/capita/day	in kgs	
Residential reuse	0.3 to 0.6	160	
Commercial reuse	0.1 to 0.2	40	
Street Sweeping	0.05 to 0.2	15	
Total		215	directly disposed through municipality

16. **Greenbelt**: Total open space available for green belt development is 660 sq.m which is 11% of the total plot area. Further there are four nos. of 15 sq.m area allocated within the building area to be developed as lawn. Total of 165 saplings will be planted within the project site. Proposed species for plantation includes Karanja, Neem, Krushachuda, Chatiana, Ashok, Nageswar, Bottle brush, Kathachampa, Sunari etc. Due to non-availability of space within the project, the proponent (BDA) responsible for responsible for development and greenery development of Bhubaneswar will develop greenery in compensation to this project.
17. **Parking details**: The permissible parking space required for the group housing is 6500 Sq.m. However, the achieved Parking area for the project will be 7477 Sq.m. It has been estimated that per capita requirement of parking space for an Indian household is 230 sq. ft.
18. **Traffic details:**

S. No.	Particulars of the Road	NH 16
1.	Type of Carriage way	Four Lane two way
2.	As per IRC: 106 -1990 Lane Capacity (PCU /hour)	3600
3.	Existing Volume Count (PCU)	1370
	V/C Index **LOS**	**0.38** **C**
4.	Incremental Volume Count (PCU)	1444
	V/C Index **LOS**	**0.40** **C**

19. **Project cost**: Total project cost is 61.19 Cr. which include all the construction and installation cost of the building.
20. **The cost estimated towards Violation as follows** - As per the damage assessment study carried out for the project, the cost allocated is 193.74 Lakhs out of which Rs. 186.14 Lakhs has been already spent in the project and 7.60 Lakhs will be incurred during the next 1 year. For natural resource augmentation programme total cost allocated will be 49.43 Lakhs which will be used for installation of rooftop solar panel and plantation.

Sl. No	Activities	Total Cost (Lakh of Rs.)
A	Budget under Remediation plan based on the damage assessment due to violation	193.74
B	Natural Resource Augmentation Plan	49.43
Total		**243.17**
Cost allocated for the activities already carried out for the project		186.14 Lakhs
Proposed Budgetary allocation towards implementation of Remediation plan based on the damage assessment and natural resource augmentation plan due to violation		57.03 lakhs
Proposed Mandatory cost of EMP including annual operation cost		**110.85**

Table: EMP cost

Sl. No	Particulars	Amount (Rs in Lakhs)
Capital Cost		
01	Installation of STP within the project site	45.0
02	Construction of Rain Water Harvesting structure and recharge pits	20.0
03	Plantation along the project boundary	0.5
04	Construction of Surface Water Drains	20.0
05	Construction of DG stack	10.0
06	Solid waste management	2.0

Total	**105.5**

Sl. No.	Activities	Allocated Budget (Rs.)/ Annum
Recurring Cost		
1.	Maintenance of STP	4,00,000.00
2.	Plantation and maintenance of the green belt and avenue plantation	25,000.00
3.	Regular maintenance of DG set and monitoring of DG stack	50,000.00
4.	Environmental monitoring	60,000.00
Total		**5,35,000.00**

21. **Penalty cost for Violation**: In compliance to SoP for violation dated 28.01.2022, penalty provision as calculated will be 1% of the project cost of Rs. 61.19 Lakhs. As per the guideline the percentage rate will be halved if the project proponent suo-moto declares the violation. In this case the proponent has claimed that they have declared the violation and requested that penalty amount should be made halved.
22. **Environment Consultant**: The Environment consultant **M/s Kalyani Laboratories Pvt. Ltd., Bhubaneswar** along with the proponent made a presentation on the proposal before the Committee.

Considering the information furnished and the presentation made by the consultant **M/s Kalyani Laboratories Pvt. Ltd., Bhubaneswar** along with the project proponent, the SEAC recommended the following:

A. **The proponent may be asked to submit the following for further processing of EC application:**

i) Ensure that the differences between the reduced level of the bottom of rainwater harvesting pits and the reduced level of ground water during rainy season are adequate for effective recharge of collected rainwater and submit the report for the same.

ii) Disaster management plan for firefighting and provision for diesel-based hydrant.

iii) Traffic study report vetted by reputed institute.

iv) Details of case filed under violation.

v) Undertaking by PP that no occupant certificate has been issued.

vi) Safety measures to be taken, to avoid accidents as the approach road of the project is connected to NH.

vii) Total cost of the project & total turnover cost for calculation of penalty.

viii) Greenbelt area proposed is 11%. They have to submit a proposal for 20% greenbelt within the project site.

ix) The breakup of EMP cost shown in above table are costs of capital investments for creation of facilities as per EMP. Recurring cost given in table below is only Rs.5.35 lakh per annum

for these facilities. Hence "**Proposed Mandatory EMP Cost per annum Rs.110.85 lakh**" needs to be corrected accordingly.

B. **The proposed site shall be visited by Sub-Committee of SEAC to verify the followings**

i) Environmental settings of the project site.

ii) Extent of construction activity.

iii) Road connectivity to the project site.

iv) Drainage network at the site.

v) Discharge point for discharge of treated water and distance of the discharge point from the project site.

vi) Greenbelt area.

vii) Any other issues including local issues

ITEM NO. 04

PROPOSAL OF ENVIRONMENTAL CLEARANCE FOR JUGALAPADAR DECORATIVE STONE MINE OVER AN AREA OF 4.350HA. OR 10.75ACRES HECTARES VILLAGE - JUGALAPADAR, TAHASII- BAIPARIGUDA, DISTRICT-KORAPUT OF SRI GYANA DAS – EC

1. This proposal is for Environmental Clearance for Jugalapadar Decorative Stone Mine over an area of 4.350Ha. or 10.75acres hectares Village - Jugalapadar, TahasiI- Baipariguda, District-Koraput of Sri Gyana Das.
2. **Category**: As per the EIA Notification S.O. 1533, dated 14th September 2006 and subsequent amendments, this project falls under Category B (B2)
3. The Jugalapadar decorative stone mining lease area for decorative stone over an area of 4.350Ha or 10.75 Acres located in the village Jugulapadar under Tahasil Boipariguda, District Koraput, Odisha, in favour of Sri P.K Srivastava.
4. The applied Mining lease area over 4.350 Hectares or 10.75 Acres in village Jugalapadar, under Boipariguda, Tahasil of Koraput district, Odisha was granted by Department of Steel & Mines, Govt. of Odisha vide Letter No $\frac{1579}{\text{IV(DS)SM}-43/2008}$/SM Bhubaneswar, on dated 24.02.2016 in favour of Sri P.K Srivastava for 20 years.
5. The Mining Plan along with mine closure plan was approved by Director of Mines, Odisha, Bhubaneswar Memo No- 4493 on dated 13.05.2016 for a period of five years.
6. The lessee has applied for EC in DEIAA, Koraput, Odisha in 2016 & after considering the proposal the DEAC, Koraput has approved the Environment Clearance vide letter no. 6021/XX-335/16 dated 25.11.2016 in favour of the project proponent Sri Pravat Kumar Sribastav.
7. Surface right for permission granted by Office of the Collector, Koraput, Odisha vide Memo No 920/Mines Dated 28.07.2022.
8. **Location and connectivity:** The mining lease area is located in the Survey of India Toposheet no. 64J/5 of latitudes N 18^0 45' 46" to N 18^0 45' 51" & longitudes- E 82^0 23.25" to E 82^0 23.42". The land use pattern of the mining lease area comes under the non-forest waste land (Abada Ajogya Anabadi), bearing Khata no-116, Plot no- 28 and Kissam: Pahado. The Nearest railway stations is at Jeypore Railway Station at distance of 22.30km. The Gupteswar road (SH-24) is connected to NH-326 at a distance of 4km. Bergan Bridge on Kurulu River at a distance of 0.9Km. Nearest Airport is Jeypore Airport which is at a distance of 22Km.
9. **Reserves:** As per the estimation the geological reserve is found to be 35080m^3 & Mineable reserve for decorative stone is found to be 21880m^3.
10. **Mining method**: Decorative stone in the applied M.L area is proposed to be mined out by semi-mechanized opencast mining through the formation of safe benches on single shift basis. Height and width of the benches will be kept at 3m and 5m respectively. Overall pit slope angle will be 31° with the horizontal. The major activities in this quarry are removal of waste materials, block cutting & dressing, loading & transportation of blocks and waste disposal. Hydraulic excavator will be used to remove the weathered rocks / waste associated with the dolerite boulders. Jack-hammer with compressor arrangement will be making holes for line drilling at 15cm to 20 cm interval. Wedges and feathers will be inserted in these holes and hammered in a calculated sequence for splitting of blocks from the face. After the development of cracks, hydraulic jacks

of excavator will be used to push the bigger blocks away from their mother rock mass. Hydraulic excavator will be used for tilting, lifting and loading of the blocks. These blocks will be pushed & loaded in to trailers. This excavator in combination with a rear dump truck will also be used to remove the rejected blocks or mine waste from quarry faces for a short distance. After detaching the blocks from their mother rocks, these are to be shifted from quarry faces to dressing yard/ quarry floor. Pitcher/sledge hammers & chisels of different sizes will be used to have well shaped blocks free from protrusions and irregularities.

11. **Transportation**: The decorative stone blocks will be extracted, loaded and transferred from a quarry face to the stone cutting shop/processing plant/port through trailers/lorries/ trucks. Mineral rejects (off-standard blocks of irregular size, with cracks & unacceptable color variation), rubble stone will be transported through tippers to the waste dump as waste/ rejects.

12. **Production and waste:** During the total plan period of five year there has been targeted to excavate 54000 m^3 of rock zone, which will generate 10,800m^3 (20% of total mass) of decorative stone blocks, 2700$m^3$of is under presently non-salable stone (5% of total mass) and remaining 40500m^3 of waste/rejects. Saleable Decorative Stone to waste ratio 10,800 / 40,500 = 1 : 3.75 and saleable decorative stone to presently non-saleable stone = 10,800 / 2,700 = 1 : 0.25.A total of 40500m^3amount of waste rock to be generated during the plan period. These waste rock will be utilized for maintenance of road stack yard etc inside the lease area. Presently Non-saleable materials will be utilized con-currently for construction and maintenance of road in the lease area & will be sold to the local entrepreneurs for use as construction materials or for recovery of small size tiles.

S. No	Particulars	Details
1	Production Plan	Volume of Decorative Stone-2400 (c.u.m)/annum Maximum
2	Altitude of decorative stone exposure	Highest altitude of 623m and the lowest point is at 599m.
3	Maximum depth of the Decorative stone	23 M (399m RL)
4	Grade	Granite gneiss known as Dolerite dykes/ Black Granite.
5	Decorative stone out of total rock mass	20%
6	Generation of waste.	75%
7	Bulk density	2.6 t/m^3
8	Bench height	3 m
9	Bench width	5 m
10	Decorative stone to waste +rejects	1 : 3.75

Year	Volume of excavation	Volume of Waste (75%)	Volume of presently non-saleable stone (5%)	Volume of decorative Stone (20%)
	(m^3)	(m^3)	(m^3)	(m^3)
1st	9,000	6,750	450	1,800
2nd	10,000	7,500	500	2,000
3rd	11,000	8,250	550	2,200
4th	12,000	9,000	600	2,400
5th	12,000	9,000	600	2,400
Total	**54,000**	**40,500**	**2,700**	**10,800**

13. **Greenbelt**: There will be proposed for green belt development over an area of 0.37 Ha. in and along the periphery of the quarry lease area of during the plan period by 925 nos. of saplings for rehabilitation.

Year	Area of Plantation in Ha	No of saplings Planted	Name Of Species Proposed	Location
1st year	0.2	500	Mango, Neem, Mahaneem, Chakunda, Teak, Salapa, Sal, Mahua,	Safety Zone
2nd year	0.17	425		
Sub-Total	**0.37**	**925**		
Conceptual period	0.800	1600	Agave americana, Lantena camara, Odoratus sps, Clystanthus collinus, Wood fordia fruticosa	Dump yard, Stack yard
Plantation along connecting road	0.5 km	500	Mango, Neem, Teak, Simarouba, Chakunda, Jamun, Tamarind	Both side of the connecting road)

14. **Water requirement**: During the mining operation there is no perennial nala within the lease area. The water will be taken from the nearby bore wells through tankers used for non-domestic purpose. Water from the tube well will be used for domestic consumption and for other purpose the water will be taken from the pond near to the lease area. Total 5.5KLD of water will be utilized for the mine work. Out of total requirement of water 0.5KLD is for domestic purpose and 5KLD for non-domestic purpose. Water will be sourced from local fire tankers.
15. **Employment potential**: A total of 25-nos. of employed in the mine. There will be 6 nos of Administrative Staffs, 9 no. of Skilled and 5 no. of semi-skilled & 2no of un-skilled workers category in the mine workers.
16. **Project cost**: The cost of the project is Rs 30 lakhs. EMP cost includes a capital cost of 6 lakhs and recurring cost of 4 lakhs.

Table: Cost of EMP (capital cost)

S. N.	Particulars	Cost in Lakh

I.	**Pollution Control**	
1	Water Tanker	4.00
2	Garland drains & retaining walls around the dump	1.00
	Sub Total	**5.00**
II.	**Occupational Health**	
1	Safety equipment& occupational health check up	0.5
	Sub Total	**0.5**
III.	**Green Belt& Miscellaneous**	0.5
	Grand Total	**6.0**

Table: Cost of EMP(recurring cost)

Sl. No.	Particulars	Cost in (Lakhs)
I.	**Pollution Control**	
1	Regular Water sprinkling in the dust prone areas	1.0
2	Maintenance of garland drain, settling tank & retaining wall	0.5
	Sub Total	**1.5**
II.	**Pollution Monitoring**	
1	Air, Water & Noise pollution Monitoring	1.0
	Sub Total	**1.0**
III.	**Occupational Health**	
1	PPEs for workers	0.5
2	Regular health check ups	0.5
	Sub Total	**1.0**
IV.	**Green Belt**	0.5
	Total	**4.0**

Table: CSR cost

S. No.	Particulars	Amt. in Lakh of Rs.
1	Repairing of Roads from lease area to village	2.00
2	Repair & Mntc. of tubewells for Drinking Water Provision	1.00
3	Financial Assistance to local school	0.5
4	Gross Plantation in waste land of the village	0.5
	Grand Total	**4.0**

17. **Environment Consultant**: The Environment consultant **M/s Kalyani Laboratories Pvt. Ltd., Bhubaneswar** along with the proponent made a presentation on the proposal before the Committee.

Considering the information furnished and the presentation made by the consultant, **M/s Kalyani Laboratories Pvt. Ltd., Bhubaneswar** along with the project proponent, the SEAC recommended for grant of Environmental Clearance upto lease period with stipulated conditions as per **Annexure – C and following additional conditions;**

i) Haulage road shall be developed and maintained perennially and perpetually by the proponent in consultation with the concerned authority of the Govt.

ii) The project proponent shall maintain periodic health check-up records of their employees and ensure use of face mask by workers in crushing and handling sections of the decorative stone quarry for ensuring that working personnel are not affected by silicosis.

ITEM NO. 05

PROPOSAL OF ENVIRONMENTAL CLEARANCE OF M/S FERRO ALLOYS CORPORATION LTD. FOR PATABALI COB PLANT OF CAPACITY 4,95,000 TPA THROUGHPUT OVER AN AREA OF 21.95 AC. AT VILLAGE: - PATABALI TEHSIL:-DANAGADI, DISTRICT:- JAJPUR OF SRI SANDEEP KITTANA ACHARYA - EC

1. This proposal is for Environmental Clearance of M/s Ferro Alloys Corporation Ltd. for Patabali COB Plant of Capacity 4,95,000 TPA throughput over an area of 21.95 Ac. at Village Patabali Tehsil:-Danagadi, District:- Jajpur of Sri Sandeep Kittana Acharya.
2. **Category**: As per EIA Notification 2006 and its subsequent amendments, the proposed project falls under Schedule 2(b)- Mineral beneficiation of Category "B1"
3. **TOR details**: SEIAA granted Terms of Reference (TOR) for the proposed project vide file No. SIA/OR/IND/77824/2022 dated 23 December 2022.
4. **Public hearing details**: The Public Hearing was held on 21.4.2023 (at 11:00 A.M.) at village Patabali under Danagadi tehsil of Jajpur district for Environmental Clearance in respect of M/s Ferro Alloys Corporation Limited, for Installation & operation of Patabali Chrome Ore Beneficiation Plant of Capacity 4, 95,000 TPA throughput at Village-Patabali, Tehsil-Danagadi, District- Jajpur, Odisha. Issues raised during public hearing are health, education, women empowerment, air water and noise pollution control measures, pollution control measures for Ganda Nallah, water conservation, solid waste management, local employment, local area development. Total expenses incurred for action plan of public hearing is Rs. 4,11,00,000.
5. **Location and connectivity**: The project site is located at Village - Patabali, Tehsil - Danagadi, and District - Jajpur of Odisha State. The site falls under the Survey of India Toposheet No. F45N-16 & F45O-4 bounded by Latitude-21° 5' 24.345" N& 21°5' 37.637"N and Longitude-85° 57' 54.942" E &85°58'6.328"E. The plant footprint will have an area of 21.95 acres located at Village - Patabali, Tehsil - Danagadi, District- Jajpur, Odisha. The project area is accessible through road to the nearby Expressway and is well connected to Duburi, Chandikhole, Jajpur Road and Paradeep through road network. There is no wildlife sanctuary or notified eco-sensitive area within 10 km radius of the project area. The project is situated about 2km from Tomka Railway station. The National Highway No-16 is about 15km and Keonjhar- Paradep Expressway is 0.01km away from the project area. There is no major habitation around the project area and the nearest habitation is Patbali Village at 500m away from the project boundary. There are no 1st or 2nd order natural drainage system within the project area.

6. **Baseline study:** Baseline study of the study area was conducted during Summer Season (March to May 2022).
   a) Ambient Air Quality Monitoring reveals that the concentrations of PM10 and PM 2.5 for all the 8 AAQM stations in the study area on a 24 hourly basis were found between 31.20 to 57.30 µg/m3 and 16.40 to 28.40 µg/m3 respectively. The high value of Particulate pollutant was observed at plant site which can be attributed to industrial activities and vehicular movement. The concentrations of SO2 and NOX were found to be in range of 5.10 to 8.80 µg/m3 and 10.10 to 16.50 µg/m3 respectively.
   b) Ambient noise levels were measured at 7 locations around the project site. Noise levels vary from 48.6 to 58.04 Leq dB(A) during day time and from 34.07 to 41.08 Leq dB(A) during night time.
   c) The ground water analysis for all the 5 sampling stations shows that pH value varies from 6.94 to 7.82 &Total Hardness varies from 96 to 125 mg/L.
   d) Surface water analysis for all the 6 sampling stations shows that pH varied from 7.30 to 8.19, Total Hardness varies from 90 to 126 mg/L. & Total Dissolved Solids varies from 68 to 220mg/L.
   e) Soil monitoring was carried out at 6 locations and the analysis results show pH value ranging from 6.9 to 7.5, which shows that the soil is acidic in nature. Organic Matter ranges from 0.62 to 0.92% in the soil samples. Nitrogen is found it ranges from 189.6 to 199.2 Kg/hectare and Phosphorous is from 6.8 to 7.8kg/ha, whereas the Potassium is found to be ranging from 108 to 123 Kg/ha. Soil of the area is found to be suitable for agricultural purposes.

STUDY PERIOD : MARCH - 2022 TO MAY -2022			
MONITORING STATION	PARAMETERS	RESULTS	STANDARD
AAQ PARAMETERS AT 8 LOCATIONS	$PM_{2.5}$	16.4 to 28.4 µg/m^3	60 µg/m^3
	PM_{10}	31.2 to 57.3 µg/m^3	100 µg/m^3
	SO_2	5.1 to 8.8 µg/m^3	80 µg/m^3
	NOx	10.1 to 16.5 µg/m^3	80 µg/m^3
	CO	0.11 to 0.66 mg/m^3	4 mg/m^3
AAQ MODELLING (Incremental GLCs)	PM_{10}	0.0007 to 0.03 µg/m^3	
	CO	0.005 to 0.330 µg/m^3	
GROUND WATER QUALITY AT 5 LOCATION	pH	6.73 to 7.82	6.5 to 8.5
	Total Hardness	87.36 to 125 mg/l	200 mg/l
	Chlorides	25.91 to 38.99 mg/l	250
SURFACE WATER QUALITY AT 6 LOCATIONS	pH	7.3 to 8.19	5.5 to 8.50 mg/l
	Total Hardness	84 to 126 mg/l	-

	Chlorides	29 to 39.96 mg/l	600 mg/l
	BOD	2.2 to 2.8 mg/l	3.0 mg/l
	COD	14-20 mg/l	-
	DO	4.7 to 6.1 mg/l.	4(Minimum)
WATER LEVEL	Depth From surface	2.4 mtr to 11.20 Mtr	Varies
NOISE LEVELS AT 7 LOCATIONS	Day Time	48.6 to 58.04	65 dB
	Night time	34.07 to 41.08	55 dB

7. **Size & Magnitude of Operation**: Chrome ore beneficiation plant of 4, 95,000 Ton/yr feed for maximum production of chrome ore concentrate of 2,97,000Ton/yr (with average 60% recovery rate). The plant will be setup within an area of 21.95acres and the greenbelt will be developed in an area of 7.24acres.
8. **Land use pattern**:

Sl No.	Land use pattern	Area (Ha.)	Area (Acres)
1	Truck Parking Area	0.391	0.97
2	Rom Storage	0.640	1.58
3	Beneficiation Plant	1.121	2.77
4	Tsf(Tailing Storage Facility)	1.776	4.39
5	ETP	0.016	0.04
6	STP	0.016	0.04
7	WTP	0.021	0.05
8	Concentrate Yard	0.177	0.44
9	Other Infrastructure & Road	1.682	4.15
10	Electrical Package(Receiving Substation +Electrical Building)	0.113	0.28
11	Green Belt	2.930	7.24
TOTAL		8.883	21.95

9. **Process technology**: The process involves beneficiation of less than 40% Chromite Ore to upgrade it to 48%-52% concentrate. This includes the Hopper, Crusher, Washing, Ball Mill, Zigging and Gravity separation units. The wet tailings will be processed in Thickener followed by Filter press to produce Tailing Cakes, which will be stacked inside the premises in a designated area with impervious lining. The finished product concentrate shall be stored in sheds and raw

material shall be stored in separate area and handled by wheel loader for feeding and loading purposes.

10. **Raw Material**: The Raw Material used will be Chrome Ore of below 40% Grade Cr_2O_3 with 10% moisture with recovery rate equivalent to 40-60%. The finished products generated will be Chrome Concentrate Cr2O3 with 7-8% moisture. The total quantity of Raw material as throughput is estimated at 4,95,000 TPA.
11. **Power Requirement**: The specific Power Consumption will be 20 KWHr/Ton of Ore Processing at the proposed Plant. And accordingly to process 4,95,000 TPA Chrome Ore, 2.5 MWH Power is required for this proposed Plant which will be sourced from TPNODL. There will requirement of diesel 46.26MT/Annum, which will be sourced from outside on demand. In Case of Power Failure situation, it is envisaged that a D.G Set of 500 KVA of Kirloskar/Cummins make will be installed which will operate as emergency power back up for the plant during the power cut.
12. **Water Requirement:** The makeup water requirement for the proposed project will be 485 KLD including 10 KLD domestic water.

Sl No.	Particulars	Quantity	Source	Mode
1.	Fresh Water Requirement (KLD)	485 KLD	Ground water	Borewell
2.	Power Requirement	2.5 MWH	TPNODL	Under ground Cable
3.	Fuel Requirement (Diesel)	46.26 MT/Annum	Supplier	Road

13. **Waste water management:** The waste water discharged from COB plant will be passing through tailing thickener and filter system and the same water will be recycled & used as process water for the COB Plant. Part of the recycling water will be taking to the ETP and the treated water from ETP will be used for dust suppression, afforestation & other industrial use purpose.
14. **Tailing generation and management:** In the given beneficiation process, 40% by volume tailings will be generated in the form of filter cakes, which needs to be managed efficiently. The Tailing Generation is been calculated as below. Considering the range of concentrate recovery is 40-60% the tailing generation has been taken in higher side i.e. 60% tailing generation. 2,97,000 TPA tailings will be generated. Temporary storing in designated area of 297000 TPA and the accumulated solids from tailing storage yard/facility shall be transferred and disposed for the purpose of backfilling of mine void/reclamation.
15. **Greenbelt:** Based on the agro climatic conditions of the region, location of the plant and physico bio chemical properties of the soil strata in addition to the nature of pollutants and their rate of dispersion, Local plant species have been identified for green belt development. The green belt will be developed over 33% of the total project area. Species to be planted are *Shorea robusta, Terminalia bellirica. Terminalia chebula, Terminalia alata, Pterocapus marsupium, Madhuca indica, Anogeissus latifolia, Diospyros melanoxylon, Dendro calamusstrictus, Cleistanthus collinus, Cassia fistula, Carissa spinarum, Combretum roxburghii etc.*
16. **Rainwater harvesting:** The estimated hourly runoff from the area is estimated at 15.206 m^3 . Considering 90 days of rainfall per year, the daily and annual rainfall is 121.648 m^3 and 10948

m^3 respectively. This harvestable water has been planned to be stored in an open rainwater harvesting pond of capacity: 1245 Sqm x 4 = 4980 cum.

17. **Manpower Requirement:** The project will generate 84 nos. of manpower, out of which 25 skilled, semi skilled 36 & unskilled and the rest 23 nos will be recruited as Administrative & Operating personnel and around 250 people will be indirectly engaged in various operations.
18. **Project cost:** The total investment in the project is estimated to be around Rs 55.4 Crores and out of which the firm will take a term loan of Rs 45 Crores and the remaining will be contributed by the promoters from their own source. EMP Cost is Rs. 720 Lakhs (capital Cost) &Rs.90 Lakhs (Recurring Cost).

Sl. No.	Particulars	Capital Investment (Rs. in lacs)	Recurring Investment (Rs. in lacs)
1	Air Pollution Control	115	5
2	Water Pollution Control	45	2
3	Noise Pollution Control	17	2
4	Environment Monitoring & Management	87	15
5	Occupational Health	7	2
6	Risk control measures	5	Included in the Environmental Monitoring
7	Safety & Disaster Management Plan	20	5
8	Green Belt	13	6
9	PH compliance	411	53
Sub Total		**720**	**90**

19. **Environment Consultant**: The Environment consultant **M/s Ardra Consulting Services Pvt. Ltd, Bhubaneswar, Odisha** along with the proponent made a presentation on the proposal before the Committee.

Considering the information furnished and the presentation made by the consultant, **M/s Ardra Consulting Services Pvt. Ltd, Bhubaneswar, Odisha** along with the project proponent, the SEAC decided to take the decision on the proposal after receipt of the following from the proponent:

a) Since, part of the land has not been acquired, land document and status of land acquisition of project area to be submitted.

b) Permission /Clearance from water resources department for use of ground water.

c) Design/layout of proposed 6 metre height of tailing storage and its management.

d) Chemical analysis of the tailings for hexavalent chromium.

e) Water analysis report of Nala, water bodies near habitation and samples of ground water collected from the study area for contents of hexavalent chromium, manganese and other heavy metal elements such as vanadium, mercury etc.

f) Ensure that the differences between the reduced level of the bottom of rainwater harvesting pits and the reduced level of ground water during rainy season are adequate for effective recharge of collected rainwater and submit the report for the same.

g) Explore the possibility for the installation of permanent storage tanks/ ponds for rainwater and its use as per the requirement.

h) Explore the possibility for the application of membrane technology for waste water treatment.

i) Changes made in EIA report in tabular form before and after public hearing.

ITEM NO. 06

PROPOSAL OF ENVIRONMENTAL CLEARANCE OF M/S TESKO HOTELS & MALLS INFRAPROJECTS PVT. LTD. FOR COMMERCIAL HOTEL BUILDING B+S+9 STORIED OVER A BUILT-UP AREA 36830.99 SQM LOCATED AT MOUZA -CHANDRASHEKHARPUR, TAHASIL-BHUBANESWAR, KHORDHA OF SRI ANUP LAKHOTIA - EC

1. This proposal is for Environmental Clearance of M/s Tesko Hotels & Malls Infra projects Pvt. Ltd. for Commercial Hotel Building B+S+9 storied over an built up area 36830.99 sqm located at Mouza - Chandrashekharpur, Tahasil- Bhubaneswar, Khordha of Sri Anup Lakhotia.
2. **Category**: This project falls under Category "B", Project or Activity 8(a) Building and Construction projects as per EIA Notification dated 14th Sep, 2006 as its amendments.
3. **Project details**: M/s Tesko Hotels & Malls Infra Projects Pvt. Ltd is proposing the Commercial cum Hotel Building project in the Plot Area of 12140.6 sqm.
4. **Airport clearance**: Airport NOC was obtained with NOC ID : BHUB/EAST/B/030223/ 744292, Dt.28.03.2023.
5. **Location and Connectivity**: The proposed site is located at Plot No - 321 (C/2), Khata No- 619 of Mouza - Chandrashekharpur, Tahasil - Bhubaneswar, District – Khordha, Odisha. The Geographical co-ordinates of the project site is Latitude 20^0 19' 21.76" N to 20^0 19' 16.00" N and Longitude 85^0 48' 05.56" N to 85^0 48' 02.24" E. The area comes under Survey of India Toposheet No: F45T15. The project site is connected with National Highway NH-16 towards South at a distance of 4.0 km. Bhubaneswar town is located at a distance of 3.8 km. The nearest Railway station is Bhubaneswar Railway station at a distance of 7.5 km, SE direction from project site. Biju Patnaik Airport is at 7.0 km (South). Bhubaneswar Fire Station is located at a distance of 4.7 km.
6. **Built Up Area Details:** Plot Area is 12140.60 Sqm. Total Proposed FAR Area is 22196.78 Sqm. Total Built-up Area is 36830.99 Sqm. Green Area is 1672.72 Sqm. Height of the Building is 39.83 Mts. No. of Blocks is 1 Block with B+ S+9 Floors. No. of Rooms is 123.

S. No	Details of Land Use	Area in Sqm
1.	Plot Area	12140.60
2.	Total Proposed FAR Area	22196.78
3.	Total Proposed Non-FAR Area	14,634.21
4.	Total Built-up Area	36830.99
5.	Total Green Area	1672.72

6.	Height of the Building	39.83 Mts

7. **Parking Area:** Parking Required as per BDA: (40% of Proposed F.A.R) = 8878.71 Sqm. Provided Parking area is 11045.82 Sqm. In terms of ECS @ 32 Sqm : Cars 345 + Bike parking – 115 Nos.
8. **Water Requirement:** The total water requirement of the project during occupational stage is 110 KLD. Domestic Water required is 104 KLD. Flushing Water will be 39.0 KLD. No Objection Certificate for Ground Water Abstraction was obtained with NOC from CGWB with NOC No. CGWA/NOC/INF/ORIG/2023/17946. Dt.15.03.2023 Valid up to 14/03/2028.

Domestic Water Requirement	143.0 KLD
Fresh water	104.0 KLD
Flushing water	39.0 KLD
Waste Water Generated (@ 80% fresh water + 100% flushing water)	83 +39 =122 KLD
STP Capacity Provided (at 1.2 times of W.W generated)	150 KLD
Treated waste water from STP (@90%)	110 KLD

9. **Waste water generation and management**: Waste water generation is 122 KLD which will be treated in STP of capacity 150 KLD proposed to be constructed at the site. Treated water from the STP will be used for flushing and horticulture purpose. STP will be provided with MBBR Technology
10. **Solid Waste Management:** Total solid waste generation will be 460 Kg/Day. Garbage will be 442.5 Kg/Day in which Biodegradable Waste 265.5 Kg/Day @ 60% will be treated in In-house Organic Waste Convertor and Non-Biodegradable waste 177Kg/Day @ 40% will be Sent to Authorized Vendors as per SWM Rules 2016. Landscape waste will be 0.083 Kg/Day. STP Sludge generation will be 17.08 Kg/day.

WASTE SOURCE	DISPOSAL
Garbage – 442.5 Kg/day	▪ Segregation at Source & Disposed properly as per SWM Rules 2016 ▪ Bio-Degradable – 265.5 Kgs/day – Organic Waste Convertor ▪ Non-Bio-Degradable – 177 Kgs/day – (Authorized Re-cyclers/vendors)
STP Sludge – 17.08 Kg/day	▪ Which is used as manure
Landscape waste -0.083	▪ Which is used as manure

11. **Rainwater Harvesting:** Rain Water will be harvested through 10 nos. of Rain Water recharging pits.

Rainwater Harvesting

Type of Area	Area (in m^2)	Coefficient of run-off	Peak rainfall intensity during one hour of rainfall (in m)	Rain water harvesting potential/hour (in m^3)
Roof-top area	4856.59	0.95	0.140	645.93
Green Area	1672.72	0.10	0.140	23.42
Total storm water load on the site with per hour retention is				669.35
Considering 15 minutes retention time, total storm water load				167.34
Taking the radius as 1.5 m and effective depth as 3.0 m , volume of a RWH pit (π r2h)				21.87
Hence no. of pits required in approx = Total storm water load considering 15 minutes retention time / Volume of a RWH pit				8 nos. required and provided 10nos.

12. **Power Requirement**: The total consolidated electrical load estimate for proposed project is about 1628.8 Kw. Power backup in case of grid failure will be by 2 nos. of DG sets of 1010 KVA and 1250 KVA (1) capacities.
13. **Solar Power Generation:** Solar power generation is 89 KVA PV solar panels. This will be utilized for solar assisted water heating system.

Table: Energy savings

Description	Energy Required (KW)	Energy Saved (KW)	Energy Saved (KW) in %
Compact Fluorescent Lamp(CFL)	152	152	13.0
Light Emitting Diodes (LED)	78		
Conventional Street Lights	3.12	2.88	
Solar Street Light	2.88		
Electrical Water Heaters	198	58	
Solar Water Heaters	87		
Other Energy Requirements	1027.72	-	
Total Energy Requirement in Project	1628.8	212.88	

14. **Green Belt Development:** Green belt will be developed over an area of 1672.72 Sqm (13.77 %) of the plot area by planting 152 nos. of plant species like Neem, Bel, Gooseberry, Acacia, Chakunda etc.

15. **Firefighting Arrangements:** The height of the building is upto 39.83 mts. Fire Extinguisher, First Aid Hose Reel, Wet Riser, Yard Hydrant, Automatic Sprinkler System, Manually operated Electronic Fire Alarm System, Underground Static Water Tank, Overhead Tank will be provided as safety measures in the building block. Internal road of 6.0 mt width has been demarcated for movement of fire vehicle. Fire NOC recommendation issued with number RECOMM1204130052023001248,Dt.05.06.2023.
16. **Traffic Study:** Traffic Composition after development of the project will be good. Traffic study report was prepared by School of Civil Engineering, KIIT Deemed to be University, Bhubaneswar.
17. **Project cost**: The project cost is estimated to be Rs. 98.80 Crores and there is a budgetary provision of Rs.12 Lakhs as capital cost and Rs.7.0 Lakhs as recurring cost during construction phase and Rs.59 Lakhs as capital cost and Rs.10.0 Lakhs as recurring during operational phase towards environmental protection measures.

Table: EMP budget during operational phase

S.No	Activity	Capacity /Area/Nos.	Capital Cost (Lakhs)	Recurring Cost (Lakhs)
1	STP	150 KLD	40.0	4.0
2	Landscaping & Planting trees	152	6.0	2.0
3	Solid waste Management	460 Kg/Day	4.0	1.0
4	RWH Pit Installation	10.0	4.0	1.0
5	Environmental Monitoring	Air, Water, Soil & Noise	5.0	2.0
Total			59.0	10.0

18. **Environment Consultant**: The Environment consultant **M/s Rightsource Industrial Solutions Pvt. Ltd. Hyderabad** along with the proponent made a presentation on the proposal before the Committee.

Considering the information furnished and the presentation made by the consultant, **M/s Rightsource Industrial Solutions Pvt. Ltd**. **Hyderabad** along with the project proponent, the SEAC recommended the following:

A. **The proponent may be asked to submit the following for further processing of EC application:**

a) Details of width of fire corridor, service road, DG space etc.

b) Possibility to explore separate ramps for entry and exit in parking area. Further, separate parking area for Hotel and Mall shall be explored.

c) Detailed drainage plan, internal drainage details, discharge point, drainage permission with supporting documents applied for NOC for drainage from concerned authority.

d) Certificate from the concerned DFO that location is not coming within Notified Eco-Sensitive Zone of Chandaka-Dampada Wildlife Sanctuary.

e) Detailed calculation of greenbelt with breakup and dimensions and provision to increase the greenbelt minimum up to 20% as the proposal for 13% greenbelt is not acceptable.

f) Ensure that the differences between the reduced level of the bottom of rainwater harvesting pits and the reduced level of ground water during rainy season are adequate for effective recharge of collected rainwater and submit the report for the same.

B. **The proposed site shall be visited by Sub-Committee of SEAC to verify the followings**

i) Environmental settings of the project site.

ii) Construction activity, if any started at the site.

iii) Road connectivity to the project site.

iv) Drainage network at the site.

v) Discharge point for discharge of treated water and distance of the discharge point from the project site.

vi) Any other issues including local issues.

ITEM NO. 07

PROPOSAL OF ENVIRONMENTAL CLEARANCE OF M/S SJD- PRESIDENCY HOMES LLP FOR RESIDENTIAL PROJECT "ROYAL PRESIDENCY" OVER A BUILT-UP AREA 31862.910 M2 AT PLOT NO. -755,755/4117, RAGHUNATHPUR, P.S. NANDANKANAN, BHUBANESWAR, DISTRICT – KHURDA OF SRI BHABANI SHANKAR RATH - EC

1. This proposal is for Environmental Clearance of M/s SJD- Presidency Homes LLP for Residential Project "Royal presidency" over an built up area 31862.910 m2 at Plot No. -755,755/4117, Raghunathpur, P.s. Nandankanan, Bhubaneswar, District – Khurda of Sri Bhabani Shankar Rath.
2. **Category**: The project falls under category "B" or activity 8 (a)-Building and construction project under EIA Notification dated 14th September 2006 as amended from time to time.
3. The project area comes under Khurda Municipal Council and building approval is approved by Bhubaneswar Development Authority vide letter no 12746 dated 21.04.2023.
4. **Location and connectivity**: the proposed project is located at Plot No. 755, 755/4117, Mouza – Raghunathpur, P.S. – Nandankanan, Bhubaneswar, Dist.- Khordha, Odisha bounded by Latitude: 20°23'20.53"N and Longitude: 85°49'30.12"E bearing Toposheet No. F45T15. The Nearest Highway is NH-16 is approx. 5.9 km in East direction. The nearest railway station is Bhubaneswar New Junction approx. 1.2 km in south east direction from the project site and Biju Patnaik International Airport is at a distance of approx. 13.9 km in

south direction from the project site.

5. **Area details**: The total area of project site is 6,879.594 m2 (1.7 acres).

S. No.	PARTICULARS	AREA (SQ.M.)
1.	Total Plot area	6879.594
2.	Road affected area	1358.35
3.	Net Plot Area	5521.24
4.	Permissible Ground coverage (@40% of the net plot area)	2,208.498
5.	Proposed Ground coverage (@29.25 % of the net plot area)	1615.430
6.	Permissible F.A.R (@6.0 of the Net plot area)	33,127.464
7.	Proposed F.A.R (@ 4.003 of Net plot area)	22,104.530
8.	Non F.A.R	9758.380
9.	**Total Built-up Area (7 + 8)**	**31,862.910**
10.	Height of the Building (m)	93.75
11.	Landscape area (18.56 % of Net plot area)	1025.280

6. **Building details**: The maximum height of the building will be 88.34 m. The total plot area is 6,879.594 sqm. The permissible ground coverage will be 2,208.498 sqm (40% of the plot area) and proposed Ground Coverage will be 1615.430 (29.25 % of the plot area).The permissible FAR will be 33127.464 sqm (@6.0 of plot area) and proposed FAR will be 22104.530 sqm (@ 4.0 of plot area). The Non-FAR for the project will be 9758.380sqm. Total built up area for the project will be 31862.9103 sqm. The total population of project after proposed will be 1173 persons.

7. **Water Requirement:** The total water requirement approx. 119 KLD out of which total domestic water requirement is 104 KLD. The total freshwater requirement is approx. 71 KLD which will be met from ground water augmented with rain water.

S. No.	Description	Occupancy	Rate of water demand (lpcd)		Total Water Requirement (KLD)		
A.	Domestic Water		Fresh	Flushing	Fresh	Flushing	Total
1.	Residents	675	90	45	61	31	92
2.	Staff	75	25	20	2	2	4
3.	Visitors	423	5	10	3	5	8
		1173			**66**	**38**	**104**
	Total Domestic Water = 104 KLD						
B.	Horticulture	1025.280 m^2	7 l/sqm		7 KLD		
C.	Make up water for				5 KLD		

	Swimming Pool			
D.	Filter Back Wash water			2.5 KLD
	Grand Total (A+B+C+D) = 119 KLD			

8. Wastewater details: The project will generate approx. 94 KLD of wastewater. The wastewater will be treated in an onsite STP of 115 KLD capacity. The treated water (85 KLD @ 90% of total wastewater) will be reused for flushing (38 KLD), horticulture (7 KLD) and Swimming pool (1KLD). Surplus treated effluent will be discharged to external sewer with due permission of Development Authority.

Domestic Water Requirement	**104 KLD**
• Fresh	66 KLD
• Flushing	38 KLD
Waste water [@80% fresh + 100% flushing + 100% Filter Backwash]	52.8+38+2.5= 94 KLD
STP Capacity	**115 KLD**

9. Rainwater harvesting: Total 07 Rainwater storage tanks at different locations will be constructed. Peak hourly rainfall has been considered as 140 mm/hr.

Area	**Area (m^2)**	**Coefficient of run-off**	**Peak hourly rainfall intensity (m)**	**Rainwater collection potential/hour (m^3/hr)**
Roof-top area	1615.430	0.95	0.140	214.85 m^3/hr
Total Runoff Load =214.85 m^3/hr				
Taking 20 minutes retention time, total volume of storm water will be = 214.85 /3			71.617 m^3 say 72 m^3	
Rainwater storage tanks are proposed for rainwater collection				

10. Parking details: Total Proposed Parking is 181+24+11 = 216 ECS. Total Proposed Parking Area is 6718.550 m^2 (including 668.644 m^2 for visitors).

11. Power Requirement: The power supply will be through TPCODL. The total maximum demand is estimated as 1400 kVA. There is provision of 2 nos. of DG sets of 1010kVA and 720 kVA total 1730 kVA capacity for power back up. The DG sets will be equipped with acoustic enclosure to minimize noise generation and adequate stack height for proper dispersion.

12. Solid waste generation: The total solid waste generation will be 435 kg/day.

S. No.	**Category**	**Norms (Kg/capita/day)**	**Waste generated (kg/day)**
1.	Residents (675)	@ 0.5 kg/day	338
2.	Staff (75)	@ 0.25 kg/day	19
3.	Visitors (423)	@ 0.15 kg/day	64

4.	Landscape waste (0.2533 acre)	@ 0.2 kg/acre/day	0.06
5.	STP sludge	Waste water x 0.35 x B.O.D difference/1000	13
	TOTAL SOLID WASTE		**435 kg/day**

13. **Greenbelt**: Total green area measures 1025.280 m^2 i.e. 18.56 of the plot area. Evergreen tall and ornamental trees have been proposed to be planted inside the premises. No. of trees required = 1 tree/80 sq.m. of plot area = 5521.24 /80 = 69.01 say 69 Nos. Total no. of trees proposed is 75. The plantation matrix adopted for the green belt development includes pit of 0.3 m × 0.3 m size with a spacing of 2 m x 2 m. Peripheral plantation comprising of medium height trees (7 m to 10 m) and shrubs (5 m height) are proposed for the green belt.
14. **Project cost**: Total Project cost is INR 95 Cr. Including land and development cost. The capital cost for environmental management of the proposed project is estimated to be Rs. 33.47 lakhs. Rs. 15.01 lakhs per year will be required as annual recurring expenses to meet the recurring expenditure for implementing the measures

Table: COST OF ENVIRONMENT MANAGEMENT PLAN

COMPONENT	**CAPITAL COST (INR LAKH)**	**RECURRING COST (INR LAKH/YR)**
Sewage Treatment Plant	11.5	2.88
Rain Water Harvesting System	10.5	2.6
Solid Waste Management	0.87	0.22
Environmental Monitoring	0	9
Green Area/ Landscape Area	0.6	0.16
Others (Energy saving devices, miscellaneous)	10	0.15
Total	**33.47**	**15.01**

Table: Environmental monitoring cost (operation phase)

S. No.	Particulars	Parameters	Frequency	Approx. Recurring Cost /Annum (INR Lakh)
1.	Ambient Air Monitoring	$PM_{2.5}$, PM_{10}, SO_2 CO & NO_2	Once in Every Three Months	2.0
2.	Stack Emission Monitoring	$PM_{2.5}$, PM_{10}, SO_2, NO_2, CO HC	Every Six Months	2.0
3.	Treated Effluent Monitoring	pH, BOD, COD, Oil, Grease & Total	Daily	2.0

		Suspended solids		
4.	Noise Level Monitoring	24 Hrs. Noise Level	Every Three Months	1.0
5.	Water Quality Monitoring	Drinking Water Specifications as per IS 10500	Once in three months	2.0
	TOTAL			9.0 Lakh

15. **Environment Consultant**: The Environment consultant **M/s Grass Roots Research & Creation India (P) Ltd**. **Noida** along with the proponent made a presentation on the proposal before the Committee.

Considering the information furnished and the presentation made by the consultant, **M/s Grass Roots Research & Creation India (P) Ltd**. **Noida** along with the project proponent, the SEAC recommended the following:

A. **The proponent may be asked to submit the following for further processing of EC application:**

a) Calculation of parking area details along with percentage.

b) Provision for increase in greenbelt minimum up to 20% and accordingly, detailed calculations to be submitted.

c) Undertaking by the Project Proponent that the commercial complex will be used for residents of the apartment only.

d) Source of water used for construction purposes.

e) Width of fire fighting corridor.

f) Details of arrangement for proper drainage of storm water and excess treated water

g) RL of ground water during summer and rainy season along with the RL of the bottoms of the proposed rainwater collection tanks.

B. **The proposed site shall be visited by Sub-Committee of SEAC to verify the followings**

i) Environmental settings of the project site.

ii) Construction activity, if any started at the site.

iii) Road connectivity to the project site.

iv) Drainage network at the site.

v) Discharge point for discharge of treated water and distance of the discharge point from the project site.

vi) Any other issues including local issues.

ITEM NO. 08

PROPOSAL FOR AMENDMENT OF ENVIRONMENTAL CLEARANCE OF M/S TRIDENT PROPERTIES PRIVATE LIMITED FOR RESIDENTIAL APARTMENT BUILDING OVER AN BUILTUP AREA 70174.61 SQM AT PAIKARAPUR, BHUBANESWAR, DIST- KHURDA OF MV SHASHI KUMAR – MOD EC

1. This proposal is for amendment of Environmental Clearance of M/s Trident Properties Private Limited for Residential Apartment Building over a builtup area 70174.61 sqm at Paikarapur, Bhubaneswar, Dist- Khurda of MV Shashi Kumar.
2. **Category**: As per EIA Notification,2006 and its subsequent amendments, the proposed project falls in category B under Schedule in activity 8 (a)- Building & Construction Project.
3. Earlier, Environment Clearance from SEIAA, Odisha was obtained vide letter no. 6361/SEIAA & File No. 27973/14-NCP-V/06-2018, dated 30.11.2018 for Proposed Construction of Residential Apartment Building located at Mouza - Paikarapur, Bhubaneswar, Dist- Khurda, Odisha.
4. Consent to Establish (CTE) has been obtained from OSPCB vide letter no. 13094/IND-II-CTE-6533, dated 28.07.2022.
5. BDA has approved the building plan vide letter no. 3446/BDA, Bhubaneswar, dated 06.02.2020. Revised BMC approval vide letter no. 20376/BMC, dated 27.04.2023.
6. Certified EC Compliance report of existing EC has been obtained from IRO Bhubaneswar vide letter no. 109-71/EPE/573, dated 09.06.2023.
7. The total FAR area of the project is 70,174.61 sqm.
8. **Justification of amendment:** The proponent proposes to amend the existing Environment Clearance because of decrease in the number of dwelling units by converting some blocks with 1 BHK & 2 BHK units to 3 BHK units, thus reducing the building footprint and built-up area. The proponent is converting 1 large block consisting 166 (EWS 1 BHK) units into 2 smaller blocks consisting of 16 (3 BHK) units each total 32 units reduction in built-up area. Further they seek an amendment in the built-up area from 70,174.61 sqm to 84,228.65 sqm because in the previous Environment Clearance Stilt parking area of 18638.85 sqm that was not added to the FAR area of 70174.61 sqm total built up area being 88813.36 sqm.
9. **Location and connectivity:** The proposed site is located at Paikarapur, Bhubaneswar, Odisha. The Geographical coordinate of the project site is bounded by Latitude - 20^0 15' 40.20" N & Longitude - 85^0 44' 53.19" E. National Highway (NH-16) connecting Howrah-Chennai is about 3 Km away from the project site. The East Coast railway line runs at a distance of about 15 km from the project site. The Biju Patnaik Airport, Bhubaneswar is at a distance of about 13 Km from the project site.
10. **Comparative statement of area details of the project:**

Particular	**As per Existing EC**	**Amendment of EC**
Plot Area	42711.57 sqm	42095.4 sqm
Ground Coverage	17230.68 sqm (40.34%)	17230.68 sqm (40.34%)
Total FAR Area	70174.61 sqm	66824.76 sqm
Stilt Parking	18638.85 sqm	18749.30 sqm
Road Area	12013.56 sqm	19857.92 sqm
Open Parking	1310.34 sqm	2219.84 sqm
Total Parking Area	19949.19 sqm	20969.14 sqm

Green Belt Area	9715.93 sqm (22.74%)	9877.63 sqm (23.5%)
No. of Unit	500 + 166 EWS = 666 Nos.	580 Nos.
Total Builtup Area	FAR Area- 70174.61 sqm Stilt Parking- 18638.85 sqm Total Builtup Area- 88813.46 sqm	85574.06 sqm

11. **Power requirement:** The daily power requirement for the Residential apartment building is preliminarily assessed as 4607 KW (to be revise after ADS submission) source from TPCODL. To meet emergency power requirements during the grid failure, there is provision of DG set having 1x125 KVA + 1x15 KVA + 1x200KVA + 1x40 KVA + 1 x45 KVA capacity for power back up in the project.
12. **Water requirement:** Fresh make up of 304.1 KLD will be required for the project which will be sourced from Ground Water. Fresh Water consumption for the Residential People 3270 @ 90 lpcd = 294.3 m3 /day, Flushing for Residential People 3270 @ 45 = 147.15 m3 /day, Fresh Water Consumption for Floating People will be 327 nos @ 30 = 9.8 m3 /day, Flushing for Floating People will be 327 @ 15 lpcd = 4.9 m3 /day, for dust suppression and landscaping the required water will be 22.3 m3 /day and 15.5 m3 /day respectively.

Sl. No	**Description**	**Total Population**	**Per Capita Consumption (ltr/day)**	**Total Water Requirement (KLD)**
1.	Residential Population	3270 nos	90	294.3
2.	Floating Population	327 nos	30	9.8
TOTAL				304.1

13. **Wastewater management:** It is expected that the project will generate approx. 364.92 m^3/day of wastewater. The wastewater will be treated in the STP of capacity of 400 m^3/day provided within the complex. Out of which 214.85 m^3/day (to be revise after ADS submission) will be recycled within the project for flushing (152.05 m^3/day), landscaping (38.8 m^3/day), Dust Suppression (24.0 m^3/day), STP loss (20.0 m^3/day) & 130.07 m^3/day will be discharged to drain in case of non-monsoon period.
14. **Rainwater harvesting details**: Total runoff load from the project site will be 2056.21 m3/hr. Volume of each Recharge pit = 4m x 4m x 6m = 96.0 cum (approx.). So, No. of pits required= 2056.21 /96 = 21.4 say 22 nos. Total no. of Rain Water Harvesting pit provided for the proposed project is 22.0 Nos.
15. **Green belt development:** Green belt will be developed over an area of 9877.63 sqm (23.5 %) of the plot area; by using the local species like Radhachuda, Nageswar, Akash Neem, Ashok, Polanga, Karang, Bela, Pijilu, Kaniara, Tagar, Hena, etc.
16. **Solid waste management:** From the hotel complex solid waste in form of food waste from kitchen and miscellaneous waste will be generated @ 0.4 kg/person/day, which will be about 1308.0 kg/day. The generated solid waste from the hotel complex will be segregated as

biodegradable and non-biodegradable. This will be collected in separate-colored bins. Proper waste management practices will be adopted during the collection, storage and disposal of the generated solid waste and construction and demolition waste. Solid waste from sweeping and Dry Garbage containing non-biodegradable wastes like polythene bags, metal, ceramic Waste, glass etc. shall be stored in separate garbage bin and send to approved recyclers.

S. No.	Category	Counts (heads)	Waste generated (kg/day)
1.	Residents	3270 @ 0.4 kg/day	1308.0
2.	Road sweeping	3270 @ 0.1 kg/day	327.0
3.	STP Sludge	--	183.0
	Total		**1818.65**

17. **Parking Details:**

Parking Area Provided			
Stilt parking			18749.3 sqm
Open parking			2219.84 sqm
Total Parking			20969.14 sqm
Equivalent car space Provided			
	Area(sqm)	Area/ECS	
Stilt Parking	18749.3	28	670.0
Open Parking	2219.84	25	89.0
Total Parking Provided			759 ECS

18. **Project cost:** Total cost estimated for the proposed project is Rs 125.0 Crores. EMP cost includes Capital Cost of Rs. 110 Lakhs and recurring cost of 11 lakhs.

19. **Environment Consultant**: The Environment **M/s Centre for Envotech & Management Consultancy Pvt. Ltd., Bhubaneswar** along with the proponent made a presentation on the proposal before the Committee.

Considering the information furnished and the presentation made by the consultant, **M/s Centre for Envotech & Management Consultancy Pvt. Ltd., Bhubaneswar** along with the project proponent, the SEAC recommended the following:

A. **The proponent may be asked to submit the following for further processing of EC application:**

i) Land documents of deleted and added up land for the proposed modification along with the ownership details and kisam with its documentation.

ii) Clarification on width of the road (EWS) and its percentage in terms of land used in the total project area.

iii) Comparative statements of all the physical and environmental parameters in tabular form of both previous project for which EC obtained and proposed modification for which EC applied.

iv) Ensure the difference between the reduced level of bottom of rain water harvesting pit and ground water and submit the report. It should the ensured that a proper gap/difference in level is maintained.

v) Power requirement - 800 KW mentioned in presentation and 4607 KW in Form-I. Which one is correct shall be clarified.

vi) Waste water generation - 344.92 m3/day mentioned in Brief summary and 214.85 m3/day in presentation. Which one is correct shall be clarified.

B. **The proposed site shall be visited by Sub-Committee of SEAC to verify the followings**

i) Environmental settings of the project site.

ii) To ensure how much construction activities has been completed.

iii) Road connectivity to the project site.

iv) Drainage network at the site.

v) Discharge point for discharge of treated water and distance of the discharge point from the project site.

vi) Any other issues including local issues.

Member Secretary, SEAC

ANNEXURE – A

TERMS OF REFERENCE (ToR) FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT FOR KHARAG HYDROELECTRIC PROJECT (HEP) 63 MW (3X21 MW) OVER AN AREA 129.59 HA. THE PROJECT IS LOCATED IN KANDHAMAL DISTRICT OF ODISHA AND ON RIVER KHARAG, A TRIBUTARY OF TEL RIVER, IN MAHANADI BASIN OF SRI LAXMIDHAR BEHERA - TOR

STANDARD TOR FOR HYDROELECTRIC PROJECT

I. 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 analysed. Based on this analysis, the mitigation measures for minimizing the impact shall be suggested in the EIA/EMP study.

II. Details of the Project and Site

1. General introduction about the proposed project.
2. 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, the total length of tunneling of the river and the committed unrestricted release from the site of diversion into the main river.
3. A map of boundary of the project site giving details of protected areas in the vicinity of project location.
4. 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.
5. 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.
6. 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.
7. Drainage pattern and map of the river catchment up to the proposed project site.
8. 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.
9. Soil characteristics and map of the project area.
10. Geological and seismo-tectonic details and maps of the area surrounding the proposed project site showing location of dam site and powerhouse site.

11. 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.
12. Land details including forests, private and other land.
13. Demarcation of snow fed and rain fed areas for a realistic estimate of the water availability.
14. Different riverine habitats like rapids, pools, side pools and variations in the river substratum - bedrocks, rocks, boulders, sand/silt or clay etc. need to be covered under the study.

III. 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 studies should be collected for 3 seasons (Pre-Monsoon, Monsoon and Post Monsoon seasons). The study area should comprise of the following:

1. Catchment area up-to the dam site.
2. Submergence Area
3. 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. Downstream upto 10 km from tip of Tail Race Tunnel (TRT).

IV. 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.

V. Methodology for collection of Biodiversity Data

1. 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).
2. 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.

3. 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 veryimportant 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 form the entire state can be referred to. Once a listing of possible R.E.T. species form 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.
4. 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).

VI. 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

Geological & Geophysical Aspects and Seismo - Tectonics:

1. Physical geography, Topography, Regional Geological aspects and structure of the Catchment.
2. 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.
3. Landslide zone or area prone to landslide existing in the study area should be examined.
4. Presence of important economic mineral deposit, if any.
5. Justification for location & execution of the project in relation to structural components (dam height).

6. Impact of project on geological environment

Meteorology, Air and Noise:

1. Meteorology (viz. Temperature, Relative humidity, wind speed/direction etc.) to be collected from nearest IMD station.
2. Ambient Air Quality with parameters viz. Suspended Particulate Matter (SPM), Respirable Suspended Particulate Matter (RSPM) i.e. suspended particulate materials <10 microns, Sulphur Dioxide (SO2) and Oxides of Nitrogen (NOx) in the study area at 6 locations.
3. Existing noise levels and traffic density in the study area at 6 locations.

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).

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.

Water Quality

1. History of the ground water table fluctuation in the study area.
2. 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, NO2, PO4, Cl, SO4, 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) (6 locations).
3. 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

1. 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.
2. Run off, discharge, water availability for the project, sedimentation rate, etc.
3. Basin characteristics.
4. Catastrophic events like cloud bursts and flash floods, if any, should be documented.
5. 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 2 year-1.
6. Set up a G&D monitoring station and a few rain gauge stations in the catchment area for collecting data during the investigation.

7. Flow series, 10 daily with 90%, 75% and 50% dependable years discharges.
8. Information on the 10-daily flow basis for the 90 per cent dependable year the flow intercepted at the dam, the flow diverted to the power house and the spill comprising the environmental flow and additional flow towards downstream of the dam for the project may be given.
9. The minimum environmental flow shall be 20% of the flow of four consecutive lean months of 90% dependable year, 30% of the average monsoon flow. The flow for remaining months shall be in between 20-30%, depending on the site specific requirements. A site specific study shall be carried out by an expert organization.
10. 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.
11. Sedimentation data available with CWC may be used to find out the loss in storage over the years.
12. 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.

Flora

1. 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.
2. Documentation of all plant species i.e. Angiosperm, Gymnosperm, Pteriodophytes, Bryophytes (all groups).
3. General vegetation profile and floral diversity covering all groups of flora including lichens and orchids. A species wise list may be provided.
4. 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
5. Existence of National park, Sanctuary, Biosphere Reserve etc in the study area, if any, should be detailed.
6. Economically important species like medicinal plants, timber, fuel wood etc.
7. Details of endemic species found in the project area.
8. 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.
9. Cropping pattern and Horticultural Practices in the study area.

Fauna:

1. Fauna study and inventorisation should be carried out for all groups of animals in the study area. Their present status alongwith Schedule of the species.
2. Documentation of fauna plankton (phyto and zooplankton), periphyton, benthos and fish should be done and analysed.
3. Information (authenticated) on Avi-fauna and wildlife in the study area.
4. Status of avifauna their resident/ migratory/ passage migrants etc.
5. Documentation of butterflies, if any, found in the area.
6. Details of endemic species found in the project area.
7. 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.
8. Existence of barriers and corridors, if any, for wild animals.
9. Compensatory afforestation to compensate the green belt area that will be removed, if any, as part of the proposed project development and loss of biodiversity.
10. Collection of primary data on agricultural activity, crop and their productivity and irrigation facilities components.
11. For categorization of sub-catchment into various erosion classes and for the consequent CAT plan, the entire catchment (Indian Portion) is to be considered and not only the directly the draining catchment.

(D) Aquatic Ecology

1. Documentation of aquatic fauna like macro-invertebrates, zooplankton, phytoplantktons, benthos etc.
2. Fish and fisheries, their migration and breeding grounds.
3. Fish diversity composition and maximum length & weight of the measured populations to be studies for estimation of environmental flow.
4. Conservation status of aquatic fauna.
5. Sampling for aquatic ecology and fisheries and fisheries must be conducted during three seasons - Pre-monsoon (summer), monsoon and winter. Sizes (length & weight) of important fish species need to be collected and breeding and feeding grounds should also be identified along the project site or in vicinity.

(E) Socio-Economic

1. 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.
2. Collection of information with respect to social awareness about the developmental activity in thearea and social welfare measures existing and proposed by project proponent.
3. Collection of information on sensitive habitat of historical, cultural and religious and ecological importance.

4. 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.
5. Documentation of demographic, Ethnographic, Economic Structure and development profile of the area.
6. Information on Agricultural Practices, Cultural and aesthetic sites, Infrastructure facilities etc.
7. Information on the dependence of the local people on minor forest produce and their cattle grazing rights in the forest land.
8. 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.
9. Special attention has to be given to vulnerable groups like women, aged persons etc. and to any ethnic/indigenous groups that are getting affected by the project.

VII. Impact Prediction and Mitigation Measures

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

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
- Fugitive emissions from various sources

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.

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.

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 afforestation-identification of suitable native tree species for compensatoryafforestation 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.

Socio-economic aspects

- Impact on local community including demographic profile.
- Impact on socio-economic status
- 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 population will be studies. 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.

VIII. Environmental Management Plans

1. 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.

2. 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. This will bea part of the forest clearance proposal.

3. 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 and with the physical and financial details. Suitable conservation techniques (in-situ/ ex-situ) will be proposed under the plan and the areas where such conservation is proposed will be marked on a project layout map.

4. 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.

5. 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 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.

6. 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. A layout map showing the proposed sites for developing the green belt should be prepared.

7. 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. Layout map showing the landslide/landslip zones shall be prepared and appended in the chapter.

8. 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 m away from the HFL of river. The quantity of muck to be generated and the quantity of muck proposed to be utilized shall be calculated in consultation with the project authorities. Details of each dumping site viz. area, capacity, total quantity of muck that can be dumped etc. should be worked out and discussed in the plan. Plan for rehabilitation of muck disposalsites 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. Layout map showing the dumping

sites vis-à-vis other project components will be prepared and appendedin the chapter.

9. 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-à-vis other project components, should be prepared.

10. 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.

11. 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. To identify inundation areas, population and structures likely to be affected due to catastrophic floods in the event of dam failure. DMP will be prepared with the help of Dam Break Analysis. Maximum water level that would be attained at various points on the downstream in case of dam break will be marked on a detailed contour map of the downstream area, to show the extent of inundation. 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.

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

13. Public Health Delivery Plan including the provisions of drinking water supply for local population shall be in the EIA/EMP Report. Status of the existing medical facilities in the project area shall be discussed. Possibilities of strengthening of existing medical facilities, construction of new medical infrastructure etc. will be explored after assessing the need of the labour force and local populace.

14. Labour Management Plan for their Health and Safety.

15. Sanitation and Solid waste management plan for domestic waste from colonies and labour camps etc.

16. Local Area Development Plan to be formulated in consultation with the Revenue Officials and Village Pancahayats. Appropriate schemes shall be prepared under EMP for the Local Area Development Plan with sufficient financial provisions.

17. Environmental safeguards during construction activities including Road Construction.

18. Energy Conservation Measures for the work force during construction with physical and financial details. Alternatives will be proposed for the labour force so that the exploitation of the natural resource (wood) for the domestic and commercial use is curbed.

19. Environmental Monitoring Programme to monitor the mitigatory measures implemented at the project site is required will be prepared. Provision for Environment Management Cell should be made. The plan will spell out the aspects required to be monitored, monitoring indicators/parameters with respect to each aspect and the agency responsible for the

monitoring of that particular aspect throughout the project implementation.

20. A summary of Cost Estimates for all the plans, cost for implementing all the Environmental Management Plans.

21. **The prescribed TOR would be valid for a period of five years for submission of the EIA/EMP report.**

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Environmental Scientist, SEAC

ANNEXURE – B

TERMS OF REFERENCE (ToR) FOR CONDUCTING ENVIRONMENT IMPACT ASSESSMENT STUDY AND INFORMATION TO BE INCLUDED IN EIA/EMP REPORT FOR M/S TATA STEEL MINING LIMITED FOR GANDHALPADA IRON ORE MINE OF PRODUCTION CAPACITY 10 MTPA (ROM) WITH TOTAL EXCAVATION OF 18.0 MTPA (ML AREA 241.10 HA) LOCATED AT GANDHALPADA, GUALI AND BARPADA VILLAGES, BARBIL TEHSIL, KEONJHAR DISTRICT OF SRI PANKAJ KUMAR - TOR

A. STANDARD TOR FOR MINING PROJECT

1. The Environmental Clearance will not be operational till such time the Project Proponent complies with all the statutory requirements and judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.
2. Department of Mining & Geology, State Government shall ensure that mining operation shall not commence till the entire compensation levied, for illegal mining paid by the Project Proponent through their respective Department of Mining & Geology in strict compliance of judgment of Hon'ble Supreme Court dated the 2nd August 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India and Ors.
3. Year-wise production details since 1994 should be given, clearly stating the highest production achieved in any one year prior to 1994. It may also be categorically informed whether there had been any increase in production after the EIA Notification 1994 came into force, w.r.t. the highest production achieved prior to 1994.
4. A copy of the document in support of the fact that the Proponent is the rightful lessee of the mine should be given.
5. All documents including approved mine plan, EIA and Public Hearing should be compatible with one another in terms of the mine lease area, production levels, waste generation and its management, mining technology etc. and should be in the name of the lessee.
6. All corner coordinates of the mine lease area, superimposed on a High-Resolution Imagery/toposheet, topographic sheet, geomorphology and geology of the area should be provided. Such an Imagery of the proposed area should clearly show the land use and other ecological features of the study area (core and buffer zone).
7. Information should be provided in Survey of India Toposheet in 1:50,000 scale indicating geological map of the area, geomorphology of land forms of the area, existing minerals and mining history of the area, important water bodies, streams and rivers and soil characteristics.
8. Details about the land proposed for mining activities should be given with information as to whether mining conforms to the land use policy of the State; land diversion for mining should have approval from State land use board or the concerned authority.
9. It should be clearly stated whether the proponent Company has a well laid down Environment Policy approved by its Board of Directors? If so, it may be spelt out in the EIA Report with description of the prescribed operating process/procedures to bring into focus any infringement/deviation/violation of the environmental or forest norms/ conditions? The

hierarchical system or administrative order of the Company to deal with the environmental issues and for ensuring compliance with the EC conditions may also be given. The system of reporting of non-compliances / violations of environmental norms to the Board of Directors of the Company and/or shareholders or stakeholders at large, may also be detailed in the proposed safeguard measures in each case should also be provided.

10. The study area will comprise of 10 km zone around the mine lease from lease periphery and the data contained in the EIA such as waste generation etc. should be for the life of the mine / lease period.

11. Land use of the study area delineating forest area, agricultural land, grazing land, wildlife sanctuary, national park, migratory routes of fauna, water bodies, human settlements and other ecological features should be indicated. Land use plan of the mine lease area should be prepared to encompass preoperational, operational and post operational phases and submitted. Impact, if any, of change of land use should be given.

12. Details of the land for any Over Burden Dumps outside the mine lease, such as extent of land area, distance from mine lease, its land use, R&R issues, if any, should be given.

13. A Certificate from the Competent Authority in the State Forest Department should be provided, confirming the involvement of forest land, if any, in the project area. In the event of any contrary claim by the Project Proponent regarding the status of forests, the site may be inspected by the State Forest Department along with the Regional Office of the Ministry to ascertain the status of forests, based on which, the Certificate in this regard as mentioned above be issued. In all such cases, it would be desirable for representative of the State Forest Department to assist the Expert Appraisal Committees.

14. Status of forestry clearance for the broken-up area and virgin forestland involved in the Project including deposition of net present value (NPV) and compensatory afforestation (CA) should be indicated. A copy of the forestry clearance should also be furnished.

15. Implementation status of recognition of forest rights under the Scheduled Tribes and other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 should be indicated.

16. The vegetation in the RF / PF areas in the study area, with necessary details, should be given.

17. A study shall be got done to ascertain the impact of the Mining Project on wildlife of the study area and details furnished. Impact of the project on the wildlife in the surrounding and any other protected area and accordingly, detailed mitigative measures required, should be worked out with cost implications and submitted.

18. Location of National Parks, Sanctuaries, Biosphere Reserves, Wildlife Corridors, Ramsar site Tiger/Elephant Reserves/(existing as well as proposed), if any, within 10 km of the mine lease should be clearly indicated, supported by a location map duly authenticated by Chief Wildlife Warden. Necessary clearance, as may be applicable to such projects due to proximity of the ecologically sensitive areas as mentioned above, should be obtained from the Standing Committee of National Board of Wildlife and copy furnished.

19. A detailed biological study of the study area [core zone and buffer zone (10 km radius of the periphery of the mine lease)] shall be carried out. Details of flora and fauna, endangered, endemic and RET Species duly authenticated, separately for core and buffer zone should be furnished based on such primary field survey, clearly indicating the Schedule of the fauna present. In case of any scheduled-I fauna found in the study area,

the necessary plan along with budgetary provisions for their conservation should be prepared in consultation with State Forest and Wildlife Department and details furnished. Necessary allocation of funds for implementing the same should be made as part of the project cost.

20. Proximity to Areas declared as 'Critically Polluted' or the Project areas likely to come under the 'Aravali Range', (attracting court restrictions for mining operations), should also be indicated and where so required, clearance certifications from the prescribed Authorities, such as the SPCB or State Mining Dept. Should be secured and furnished to the effect that the proposed mining activities could be considered.

21. Similarly, for coastal Projects, A CRZ map duly authenticated by one of the authorized agencies demarcating LTL. HTL, CRZ area, location of the mine lease w.r.t CRZ, coastal features such as mangroves, if any, should be furnished. (Note: The Mining Projects failing under CRZ would also need to obtain approval of the concerned Coastal Zone Management Authority).

22. R&R Plan/compensation details for the Project Affected People (PAP) should be furnished. While preparing the R&R Plan, the relevant State/National Rehabilitation & Resettlement Policy should be kept in view. In respect of SCs/STs and other weaker sections of the society in the study area, a need-based sample survey, family-wise, should be undertaken to assess their requirements, and action programmes prepared and submitted accordingly, integrating the sectoral programmes of line departments of the State Government. It may be clearly brought out whether the village(s) located in the mine (ease area will be shifted or not. The issues relating to shifting of village(s) including their R&R and socio-economic aspects should be discussed in the Report.

23. One season (non-monsoon) [i.e. March - May (Summer Season); October - December (post monsoon season) ; December - February (winter season)] primary baseline data on ambient air quality as per CPCB Notification of 2009, water quality, noise level, soil and flora and fauna shall be collected and the AAQ and other data so compiled presented date-wise in the EIA and EMP Report. Site-specific meteorological data should also be collected. The location of the monitoring stations should be such as to represent whole of the study area and justified keeping in view the pre-dominant downwind direction and location of sensitive receptors. There should be at least one monitoring station within 500 m of the mine lease in the pre-dominant downwind direction. The mineralogical composition of PM_{10}, particularly for free silica, should be given.

24. Air quality modelling should be carried out for prediction of impact of the project on the air quality of the area. It should also take into account the impact of movement of vehicles for transportation of mineral. The details of the model used and input parameters used for modelling should be provided. The air quality contours may be shown on a location map clearly indicating the location of the site, location of sensitive receptors, if any, and the habitation. The wind roses showing pre-dominant wind direction may also be indicated on the map.

25. The water requirement for the Project, its availability and source should be furnished. A detailed water balance should also be provided. Fresh water requirement for the Project should be indicated.

26. Necessary clearance from the Competent Authority for drawl of requisite quantity of water for the Project should be provided.

27. Description of water conservation measures proposed to be adopted in the Project should be given. Details of rainwater harvesting proposed in the Project, if any, should be provided,

28. Impact of the Project on the water quality, both surface and groundwater, should be assessed and necessary safeguard measures, if any required, should be provided.

29. Based on actual monitored data, it may clearly be shown whether working will intersect groundwater, Necessary data and documentation in this regard may be provided. In case the working will intersect groundwater table, a detailed Hydro Geological Study should be undertaken and Report furnished. The Report inter- alia, shall include details of the aquifers present and impact of mining activities on these aquifers. Necessary permission from Central Ground Water Authority for working below ground water and for pumping of ground water should also be obtained and copy furnished.

30. Details of any stream, seasonal or otherwise, passing through the tease area and modification / diversion proposed, if any, and the impact of the same on the hydrology should be.

31. Information on site elevation, working depth, groundwater table etc. Should be provided both in AMSL and BGL. A schematic diagram may also be provided for the same.

32. A time bound Progressive Greenbelt Development Plan shall be prepared in a tabular form (indicating the linear and quantitative coverage, plant species and time frame) and submitted, keeping in mind, the same will have to be executed up front on commencement of the Project. Phase-wise plan of plantation and compensatory afforestation should be charted clearly indicating the area to be covered under plantation and the species to be planted. The details of plantation already done should be given. The plant species selected for green belt should have greater ecological value and should be of good utility value to the local population with emphasis on local and native species and the species which are tolerant to pollution.

33. Impact on local transport infrastructure due to the Project should be indicated. Projected increase in truck traffic as a result of the Project in the present road network (including those outside the Project area) should be worked out, indicating whether it is capable of handling the incremental load. Arrangement for improving the infrastructure, if contemplated (including action to be taken by other agencies such as State Government) should be covered. Project Proponent shall conduct Impact of Transportation study as per Indian Road Congress Guidelines.

34. Details of the onsite shelter and facilities to be provided to the mine workers should be included in the EIA Report.

35. Conceptual post mining land use and Reclamation and Restoration of mined out areas (with plans and with adequate number of sections) should be given in the EIA report.

36. Occupational Health impacts of the Project should be anticipated and the proposed preventive measures spelt out in detail. Details of pre-placement medical examination and periodical medical examination schedules should be incorporated in the EMP. The project specific occupational health mitigation measures with required facilities proposed in the mining area may be detailed.

37. Public health implications of the Project and related activities for the population in the impact zone should be systematically evaluated and the proposed remedial measures should be detailed along with budgetary allocations.

38. Measures of socio-economic significance and influence to the local community proposed to be provided by the Project Proponent should be indicated. As far as possible, quantitative dimensions may be given with time frames for implementation.

39. Detailed environmental management plan (EMP) to mitigate the environmental impacts which, should inter-alia include the impacts of change of land use, loss of agricultural and grazing land, if any, occupational health impacts besides other impacts specific to the proposed Project.

40. Public Hearing points raised and commitment of the Project Proponent on the same along with time bound Action Plan with budgetary provisions to implement the same should be provided and also incorporated in the final EIA/EMP Report of the Project.

41. Details of litigation pending against the project, if any, with direction /order passed by any Court of Law against the Project should be given.

42. The cost of the Project (capital cost and recurring cost) as well as the cost towards implementation of EMP should be clearly spelt out.

43. A Disaster management Plan shall be prepared and included in the EIA/EMP Report.

44. Benefits of the Project if the Project is implemented should be spelt out. The benefits of the Project shall clearly indicate environmental, social, economic, employment potential, etc.

45. The activities and budget earmarked for Corporate Environmental Responsibility (CER) shall be as per MoEF&CC, Govt. of India O.M No 22-65/2017-IA. II (M) dated 01.05.2018 and the action plan on the activities proposed under CER shall be submitted at the time of appraisal of the project included in the EIA/EMP Report.

46. The Action Plan on the compliance of the recommendations of the CAG as per MoEF&CC, Govt. of India Circular No. J-11013/71/2016-IA.I (M), dated 25,10.2017 needs to be submitted at the time of appraisal of the project and included in the EIA/EMP Report.

47. Compliance of the MoEF&CC, Govt. of India Office Memorandum No. F: 3-50/2017-IA.III (Pt.), dated 30.05.2018 on the judgement of Hon'ble Supreme Court, dated the 2nd August, 2017 in Writ Petition (Civil) No. 114 of 2014 in the matter of Common Cause versus Union of India needs to be submitted and included in the EIA/EMP Report.

B. <u>Specific TOR:</u> Recommendation of CSIR-NEERI Report on "Carrying Capacity Study for Environmentally Sustainable Iron and Manganese Ore Mining Activity in Keonjhar, Sundargarh and Mayurbhanj districts of Odisha State"

1. Department of Steel & Mines, Govt, of Odisha <u>should prepare 5 years regional</u> <u>plan for annual iron ore requirement from the state, which in turn shall be</u> <u>met from different mines/zones (e.g. Joda, Koira.') in the state.</u> Accordingly, sustainable annual production (SAP) for each zone/mine may be followed adopting necessary environmental protection measures.

2. The expansion <u>or opening of new manganese ore mines may be considered</u> <u>only when the actual production of about 80% is achieved.</u> Further, <u>the mines</u> <u>that have not produced Mn ore for last two years and have no commitment in the</u> <u>current year as well: EC capacity in such cases may be reviewed. The</u> <u>Department of Steel & Mines. Govt, of Odisha shall</u>

submit the Annual Report on this issue to the MoEF&CC for further necessary action.

3. Analysis of baseline environmental quality data for the year 2014 and 2016 indicates that existing mining activities appear to have little / no potential impact on environmental quality, except on air environment, which was mainly due to re-suspension of road dust. Therefore, all the working mines can continue to operate with strict compliance to monitoring of environmental quality parameters as per EC and CTE/CTO conditions of the respective mine, and implementation of suggested measures for control of road dust and air pollution. Odisha State Pollution Control Board has to ensure the compliance of CTE/CTO. Regional office of the MoEF&CC, Bhubaneswar shall monitor the compliance of the EC conditions. Regional office of the Indian Bureau of Mines (IBM) shall monitor the compliance of mining plan and progressive mine closure plan. Any violation by mine lease holder may invite actions per the provisions of applicable acts.

4. Considering the existing environmental quality, EC capacity, production rate, iron ore resources availability and transport infrastructure availability, the share of Joda and Koira sector works out to be 70% and 30% respectively for the existing scenario for the year 2015-16. However, for additional EC capacity, it can be 50:50 subject to commensurate infrastructure improvement (viz. SOTM. pollution free road transport, enhancement of rail network etc.) in the respective regions.

5. Continuous monitoring of different environmental quality parameters as per EC and CTE/CTO conditions with respect to air, noise, water (surface and ground water) and soil quality in each region shall be done. The environmental quality parameters should not indicate any adverse impact on the environment. Monitoring within the mines should be done by individual mine lease holders, whereas outside the mine lease area, monitoring should be done by the Govt, of Odisha through various concerned departments/ authorized agencies. Various monitoring/ studies should be conducted through national reputed institutes, NABET/ MoEF&CC accredited laboratories/organizations. The reports submitted by individual mine lease holders and study reports prepared by other concerned departments/agency for each of the regions should be evaluated and examined by SPCB/ MoEF&CC.

6. Construction of cement concrete road from mine entrance and exit to the main road with proper drainage system and green belt development along the roads and also construction of road minimum 300 m inside the mine should be done. This should be done within one year for existing mines and new mine should have since beginning. The concerned departments should extend full support; wherever the land does not belong to the respective mine lease holders. The Department of Steel & Mines, Govt, of Odisha should ensure the compliance and should not issue the Mining Permits, if mine lease holder has not constructed proper cement concrete road as suggested above.

7. In view of high dust pollution and noise generation due to road transport, it is proposed to regulate/guide the movement of iron and manganese ore material based on the EC capacity of the mines. Accordingly, ore transport mode has been suggested, as given below in Table.

Table : EC Capacity based Suggested Ore Transport Mode (SQTM)

Code	EC	Suggested Ore Transport Mode
SOTM 1	> 5 MTPA	100% by private railway siding or conveyor belt up to public

Code	EC	Suggested Ore Transport Mode
		railway siding or pipeline for captive mines and 70% for non-captive mines
SOTM 2	Between 3 and <5 MTPA	Minimum 70% by public railway siding, through conveyor belt and maximum 30% by road - direct to destination or other public railway siding or above option
SOTM 3	Between 1 and < 3 MTPA	Minimum 70% by public railway siding and maximum 30% by road - direct to destination or by other public railway siding or above options
SOTM 4	<1 MTPA	100 % by 10/17 Ton Trucks or above options

It is mentioned by State Govt, of Odisha that currently about 45% of the iron ore is despatched using rail network and progressively it will be increased to about 60% by rail/slurry over a period of 5 years, taking into account time required to set up more railway sidings.

In view of present ore transport practices and practical limitations, all the existing mines should ensure adoption of SQTM within next 5 years. New mines or mines seeking expansion should incorporate provision of SOTM in the beginning itself, and should have system in place within next 5 years. However, the State Govt, of Odisha shall ensure dust free roads in mining areas wherever the road transportation of mineral is involved. The road shoulders shall be paved with fence besides compliance with IRC guidelines. All the roads should have proper drainage system and apart from paving of entire carriage width the remaining right of way should have native plantation (dust capturing species). Further, regular maintenance should also be ensured by the Govt. of Odisha.

Transportation of iron & manganese ore through river (jetty) to nearest Sea port (Sea cargo option) may be explored or connecting Sea ports witn Railway network from the mines to be improved further so that burden on existing road and rail network and also pollution thereof can be minimized.

Progress on development of dust free roads, implementation of SOTM, increased use of existing rail network, development of additional railway network/conveyor belt/ pipelines etc. shall be submitted periodically to MoEF&CC and SEIAA, Odisha. Responsibility: Department of Steel & Mines, Govt. of Odisha; Time Period: 5 Years for developing railway/ conveyor belt facilities

8. Development of parking plazas for trucks with proper basic amenities/ facilities should be done inside mine. This should be done within one year for existing mines and new mines should have since beginning. Small capacity mines (in terms of lease area or production) not having enough space within the mine lease areas should develop parking plaza at a common place within the region with requisite facilities. Responsibility: Individual Mine Lease Holders; Time Period: 1 Year
9. Construction of NH 215 as minimum 4 lane road with proper drainage system and plantation and subsequent regular maintenance of the road as per IRC guidelines. Construction of other mineral carrying roads with proper width and drainage system along with road side plantation to be carried out. Responsibility: Department of Steel & Mines with PWD / NHAI Time Period: 2 Years.
10. Regular vacuum cleaning of all mineral carrying roads aiming at "Zero Dust Resuspension" may be considered. Responsibility: PWD / NHAI/ Mine Lease Holders; Time Period: 3

months for existing roads.

11. Expansion of existing mines and new mines should be considered after conducting recent EIA Study fas per the provisions of EIA Notification 2QQ6, as amended time to time1) with proper justification on demand scenario for iron ore requirement and availability of pollution free transport network in the region. Responsibility: IBM, Department of Steel & Mines and MoEF&CC, New Delhi.

12. **Mine-wise Allocation of Annual Production:** In case the total requirement of iron ore exceeds the suggested limit for that year, permission for annual production by an individual mine may be decided depending on approved EC capacity (for total actual dispatch) and actual production rate of individual mine during last year or any other criteria set by the State Govt., i.e. Dept, of Steel & Mines. Department of Steel and Mines in consultation with Indian Bureau of Mines-RO should prepare in advance mine-wise annual production scenario as suggested in Table, so that demand for iron ore can be anticipated, and actual production/dispatch does not exceed the suggested annual production.

Table: Allocation of Production to Different Mines for 5 Years (as per approved Mining Plan)

Mine Lease	EC Capacity (MTPA)	**Suggested Annual Production (MT)**				
		2016-17	2017- 18	2018-19	2019-20	2020-21
		Yr 1	Yr 2	Yr 3	Yr 4	Yr 5
Mine 1	XI					
Mine 2	X2					
Mine 3	X3					
Mine n	Xn					
Total	160 +	105	129	153	177	201
Next year allocation = Average of EC Capacity and Last year production						

13. Expansion of Existing Mines having Validity up to 2020: In view of implementation of MMDR Act 2015, wherein many non-captive mines are expected to be closed by March 2020, total iron ore production scenario has been. It is expected that the non-captive mines having validity till 2020 shall try to maximize their production (limited to EC capacity) in the remaining period. Further, depending upon availability of iron ore resources, these mines may also seek expansion of EC capacity. It may be noted here that total EC capacity of existing 25 working mines having validity upto 2020 is about 85 MTPA, whereas actual production from these mines has been only 44.677 MT (52.6%) during 2015-16 and 57.07 MT (67.1%) during 2016-17. Also, it is expected that these mines would not even be able to achieve ore production as per existing EC capacity till March 2020. Therefore, these existing mines should go for production to the fullest extent to meet the requisite demand from the State. However, where EC limit is exhausted, application for expansion may be considered. Further, the EC process (i.e. Grant of TOR, Baseline data collection, Mining plan/ scheme approval, Public hearing, preparation of EIA/EMP Report. Appraisal by the EAC and grant of EC) takes about one year time. Under such circumstances, it is suggested that further applications for grant of TOR or grant of EC for expansion of production capacity of the mine should be considered for those existing mines, which have exhausted their capacity subject to consideration of all environmental aspects. Responsibility: Department of Steel & Mines and MoEF&CC,

New Delhi.

14. **Sustained Iron Ore Production beyond 2020:** Considering the implementation of MMDR Act 2015, total production of iron ore in Odisha State is anticipated to be about 111 MT during 2016-17 (actual production was - 102.663 MT), 136 MT during 2017-18, 146 MT during 2018-19 and 146 MT during 2019-20. Then there will be substantial drop in total production (to the tune of 73 MT during 2020-21 onwards) due to closure of mines, which are valid up to 2020. Therefore, in order to maintain operation/sustained growth of downstream industries, iron ore mining in the region needs to be continued at a sustainable rate. The State Govt. through Department of Steel and Mines should initiate appropriate action to ensure continued availability of iron ore from the region, as per suggested sustainable annual production

15. **Reserves Estimation**-Mining Plan and Exploration; Appropriate actions (geo- technical investigation for qualitative and quantitative resource estimation & other preparations for auction of mines), may be initiated taken into account the existing working mines, and the mines which were operational at some point of time (but closed presently due to various reasons). The total iron ore reserves/ resources available within the total lease area of each mine should be estimated by State Govt./NMET/ GSI (or any other approved agency) with respect to: (i) Total lease area of mine (surface), (ii) Maximum depth to which resources could be available, (iii) Resources below the ground water table (if intersected), (iv) Reserves are to be estimated as per UNFC code with respect to quantity and quality (% Fe content), (v) Maximum mining rate and area for auction (after 2020) will be calculated based on total resources available and proposed life of mine leading to closure of mine in a stipulated time period. Responsibility: Department of Steel & Mines, IBM and GSI; Time frame: 1 year for the mines to be auctioned for next 2 years. The above mentioned organizations shall ensure the compliance with respect to timelines for implementations.

16. Depending upon availability of extractable iron ore resources within a mine, mining below the ground water table may be permitted after conducting necessary geological and hydro-geological study by GSI and requisite approval from the CGWB/CGWA (Central Ground Water Board/Authority). This can be explored at least in few mines on trial/pilot basis. Further, within a mine, it will be desirable to operate one pit at a time, and next pit should be opened after extracting maximum possible resources from the first pit, so that the exhausted pit can be used for back filling/ storing of low grade iron ore. However, depending upon the quantity and/or quality of iron/ manganese ore, other mine pits in the same mine lease may also be opened for sustainable scientific mining, as per approved mining plan/scheme of mining by IBM. The Department of Steel & Mines, Govt. of Odisha should initiate the pilot project so that minerals are fully utilized.

17. **Commercial Utilization of Low Grade Ore:** R&D studies towards utilization of low-grade iron ore should be conducted through research/academic institutes like IMMT, Bhubaneswar, NML, Jamshedpur, and concerned metallurgical departments in IITs, NITs etc., targeting full utilization of low-grade iron ore (Fe content upto 45% by 2020 and upto 40% by 2025). In fact, life cycle assessment of whole process including environmental considerations should be done for techno-economic and environmental viability. R&D studies on utilization of mine wastewater having high concentration of Fe content for different commercial applications in industries such as cosmetics, pharmaceutical, paint industry should also be explored. Responsibility: IBM, Dept, of Steel & Mines, Individual

Mine Lease Holders.

18. The mining activity in Joda-Koira sector is expected to continue for another 100 years, therefore, it will be desirable to develop proper rail network in the region. Rail transport shall not only be pollution free mode but also will be much economical option for iron ore transport. The rail network and/or conveyor belt system upto public railway siding needs to be created. The total length of the conveyor belt system/ rail network to be developed from mines to nearest railway sidings by 11 mines in Joda region is estimated to be about 64 km. Similarly, in Koira region, total length of rail network/ conveyor system for 8 mines (under SOTM 1 & 2) is estimated to be around 95 km. Further, it is suggested to develop a rail network connecting Banspani (Joda region) and Roxy railway sidings in Koira region. Responsibility: Dept, of Steel & Mines, Govt, of Odisha and Concerned Mines along with Indian Railways. Time Period: Maximum 7 years (by 2025). The Department of Steel & Mines. Govt, of Odisha should follow-up with the concerned Departments and railways so that proposed proper rail network is in place by 2025.

19. State Govt, of Odisha shall make all efforts to ensure exhausting all the iron & manganese ore resources in the existing working mines and from disturbed mining leases/zones in Joda and Koira region. The criteria suggested shall be applicable while suggesting appropriate lease area and sustainable mining rate. Responsibility: Dept, of Steel & Mines, Govt, of Odisha.

20. Large and medium mine leases contribute to better implementation of reclamation and rehabilitation plans to sustain the ecology for scientific and sustainable mining. The small leases do not possess scientific capability of environmentally sustainable mining. Therefore, new mine leases having more than 50 ha area should be encouraged, as far as possible. This will ensure inter-generational resource availability to some extent. Responsibility: Dept, of Steel & Mines, Govt, of Odisha.

21. **Mining Operations/Process Related:** (i) Appropriate mining process and machinery (viz. right capacity, fuel efficient) should be selected to carry out various mining operations that generate minimal dust/air pollution, noise, wastewater and solid waste, e.g. drills should either be operated with dust extractors or equipped with water injection system, (ii) After commencement of mining operation, a study should be conducted to assess and Quantify emission load generation (in terms of air pollution, noise, waste water and solid wasted from each of the mining activity (Including transportation) on annual basis. Efforts should be made to further eliminate/ minimize generation of air pollution/dust, noise, wastewater, solid waste generation in successive years through use of better technology. This shall be ensured by the respective mine lease holders, (iii) Various machineries/equipment selected (viz. dumpers, excavators, crushers, screen plants etc.) and transport means should have optimum fuel/power consumption, and their fuel/power consumption should be recorded on monthly basis. Further, inspection and maintenance of all the machineries/ equipment/ transport vehicles should be followed as per manufacturer's instructions/ recommended time schedule and record should be maintained by the respective mine lease holders, (iv) Digital processing of the entire lease area using remote sensing technique should be carried out regularly once in 3 years for monitoring land use pattern and mining activity taken place. Further, the extent of pit area excavated should also be demarcated based on remote sensing analysis. This should be done by ORSAC (Odisha Space Applications Centre, Bhubaneswar) or an

agency of national repute or if done by a private agency, the report shall be vetted/ authenticated by ORSAC, Bhubaneswar. Expenses towards the same shall be borne by the respective mine lease holders. Responsibility: Individual Mine Lease Holders.

22. **Air Environment Related:** (i) Fugitive dust emissions from all the sources should be controlled regularly on daily basis. Water spraying arrangement on haul roads, loading and unloading and at other transfer points should be provided and properly maintained. Further, it will be desirable to use water fogging system to minimize water consumption. It should be ensured that the ambient air quality parameters conform to the norms prescribed by the GPCB in this regard, (ii) The core zone of mining activity should be monitored on daily basis. Minimum four ambient air quality monitoring stations should be established in the core zone for SPM, PM10. PM2.5, SQ2, NCb^ and CO monitoring. Location of air quality monitoring stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board (based on Emission Load Assessment Study). The number of monitoring locations may be more for larger capacity mines and working in larger area. Out of four stations, one should be online monitoring station in the mines having more than 3 MTPA EC Capacity, (iii) Monitoring in buffer zone should be carried out by SPCB or through NABET accredited agency. In addition, air quality parameters (SPM, PMiO, PM2.5, S02, NOx and CO) shall be regularly monitored at locations of nearest human habitation including schools and other public amenities located nearest to source of the dust generation as applicable. Further, 11 continuous air quality monitoring systems may be installed in Joida and Koira regions and one in Baripada/ Rairangpur region, (iv) Emissions from vehicles as well as heavy machinery should be kept under control and regularly monitored. Measures should be taken for regular maintenance of vehicles used in mining operations and in transportation of mineral, (v) The vehicles shall be covered with a tarpaulin and should not be overloaded. Further, possibility of 3 using closed container trucks should be explored for direct to destination movement of iron ore. Air quality monitoring at one location should also be carried out along the transport route within the mine (periodically, near truck entry and exit gate).Responsibility: Individual Mine Lease Holders and SPCB.

23. **Noise and Vibration Related:** (i) Blasting operation should be carried out only during daytime. Controlled blasting such as Nonel, should be practiced. The mitigation measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented, (ii) Appropriate measures (detailed in Section 5.4) should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs/muffs, (iii) Noise levels should be monitored regularly (on weekly basis) near the major sources of noise generation within the core zone. Further, date, time and distance of measurement should also be indicated with the noise levels in the report. The data should be used to map the noise generation from different activities and efforts should be made to maintain the noise levels with the acceptable limits of CPCB (CPCB, 2000) (iv) Similarly, vibration at various sensitive locations should be monitored atleast once in month, and mapped for any significant changes due to successive mining operations. Responsibility: Individual Mine Lease Holders.

24. **Water/Wastewater Related :** (i) In general, the mining operations should be restricted to above ground water table and it should not intersect groundwater table. However, if enough resources are estimated below the ground water table, the same may be explored after conducting detailed geological studies by GSI and hydro- geological studies by CGWB or NIH or institute of national repute, and ensuring that no damage to the land stability/ water aquifer system shall happen. The details/ outcome of such study may be reflected/incorporated in the EIA/EMP report of the mine appropriately, (ii) Natural watercourse and/or water resources should not be obstructed due to any mining operations. Regular monitoring of the flow rate of the springs and perennial nallas should be carried out and records should be maintained. Further, regular monitoring of water quality of nallas and river passing thorough the mine lease area (upstream and downstream locations) should be carried out on monthly basis, (iii) Regular monitoring of ground water level and its quality should be carried out within the mine lease area by establishing a network of existing wells and constructing new piezometers during the mining operation. The monitoring should be carried out on monthly basis, (iv) In order to optimize water requirement, suitable conservation measures to augment ground water resources in the area should be undertaken in consultation with Central Ground Water Board (CGWB). (v) Suitable rainwater harvesting measures on long term basis should be planned and implemented in consultation with CGWB, to recharge the ground water source. Further, CGWB can prepare a comprehensive plan for the whole region, (vi) Appropriate mitigation measures (viz. ETP, STP, garland drains, retaining walls, collection of runoff etc.) should be taken to prevent pollution of nearby river/other water bodies. Water quality monitoring study should be conducted by State Pollution Control Board to ensure quality of surface and ground water sources on regular basis. The study can be conducted through NABL/ NABET approved water testing laboratory. However, the report should be vetted by SPCB. (vii) Industrial wastewater (workshop and wastewater from the mine) should be properly collected, treated in ETP so as to conform to the discharge standards applicable, (viii) Oil and grease trap should be installed before discharge of workshop effluents. Further, sewage treatment plant should be installed for the employees/colony, wherever applicable, (ix) Mine lease holder should ensure that no silt originating due to mining activity is transported in the surface water course or any other water body. Appropriate measures for prevention and control of soil erosion and management of silt should be undertaken. Quantity of silt/soil generated should be measured on regular basis for its better utilization, (x) Erosion from dumps site should be protected by providing geo-textile matting or other suitable material, and thick plantation of native trees and shrubs should be carried out at the dump slopes. Further, dumps should be protected by retaining walls.(xi) Trenches / garland drain should be constructed at the foot of dumps to arrest silt from being carried to water bodies. Adequate number of check dams should be constructed across seasonal/perennial nallas (if any) flowing through the mine lease areas and silt be arrested. De-silting at regular intervals should be carried out and quantity should be recorded for its better utilization, after proper soil quality analysis, (xii) The water so collected in the reservoir within the mine should be utilized for the sprinkling on hauls roads, green belt development etc. (xiii) There should be zero waste water discharge from the mine. Based on actual water withdrawal and consumption/ utilization in different activities, water balance diagram should be prepared on monthly basis, and efforts should be made to optimize consumption of water per ton of ore production in successive years. Responsibility: Individual Mine Lease Holders, SPCB and CGWB.

25. **Land/ Soil/ Overburden Related** : (i) The top soil should temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long (not more than 3 years or as per provisions mentioned in the mine plan/ scheme). The topsoil should be used for land reclamation and plantation appropriately, (ii) Fodder plots should be developed in the non-mineralised area in lieu of use of grazing land, if any. (iii) Over burden/ low grade ore should be stacked at earmarked dump site(s) only and should not be kept active for longperiod. The dump height should be decided on case to case basis, depending on the size of mine and quantity of waste material generated. However, slope stability study should be conducted for larger heights, as per IBM approved mine plan and DGMS guidelines. The OB dump should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles should be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Proper records should be maintained regarding species, their growth, area coverage etc, (iv) Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine operation, soil, OB and mineral dumps. The water so collected can be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly de-silted, particularly after monsoon and should be maintained properly. Appropriate documents should be maintained. Garland drain of appropriate size, gradient and length should be constructed for mine pit, soil. OB and mineral dumps and sump capacity should be designed with appropriate safety margin based on long term rainfall data. Sump capacity should be provided for adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and de-silted at regular intervals, (v) Backfilling should be done as per approved mining plan/scheme. There should be no OB dumps outside the mine lease area. The backfilled area should be afforested, aiming to restore the normal ground level. Monitoring and management of rehabilitated areas should continue till the vegetation is established and becomes self-generating, (vi) Hazardous waste such as, waste oil, lubricants, resin, and coal tar etc. should be disposed off as per provisions of Hazardous Waste Management Rules, 2016, as amended from time to time. Responsibility: Individual Mine Lease Holders.

26. **Ecology/Biodiversity (Flora-Fauna) Related:** (i) As per the Red List of IUCN (International Union for Conservation of Nature), six floral species and 21 faunal species have been reported to be under threatened, vulnerable & endangered category. Protection of these floral and faunal species should be taken by the State Forest & Wildlife Department on priority, particularly in the mining zones, if any, (ii) The mines falling within 5-10 km of the Karo- Karampada Elephant corridor buffer need to take precautionary measures during mining activities. The forest and existing elephant corridor routes are to be protected and conserved. Improvement of habitat by providing food, water and space for the elephants is required to be ensured to avoid Man- Elephant conflicts. Though as per the records of State Forest Department, movement of elephants in the Karo-Karampada elephant corridor within 10 km distance from the mines in Joda and Koira is not observed, the Forest Department shall further record and ensure that elephant's movement is not affected due to mining activities, (iii) All precautionary measures should be taken during mining operation for conservation and protection of endangered fauna namely elephant, sloth bear etc. spotted in the study area. Action plan for conservation of flora and fauna should be prepared and implemented in consultation with the State Forest and Wildlife Department within the mine lease area, whereas outside the mine lease area, the same

should be maintained by State Forest Department, (iv) Afforestation is to be done by using local and mixed species saplings within and outside the mining lease area. The reclamation and afforestation is to be done in such a manner like exploring the growth of fruit bearing trees which will attract the fauna and thus maintaining the biodiversity of the area. As afforestation done so far is very less, forest department needs to identify adequate land and do afforestation by involving local people in a time bound manner, (v) Green belt development carried out by mines should be monitored regularly in every season and parameters like area under vegetation/plantation, type of plantation, type of tree species /grass species/scrubs etc., distance between the plants and survival rate should be recorded, (vi) Green belt is an important sink of air pollutants including noise. Development of green cover in mining area will not only help reducing air and noise pollution but also will improve the ecological conditions and prevent soil erosion to a greater extent. Further, selection of tree species for green belt should constitute dust removal/dust capturing plants since plants can act as efficient biological filters removing significant amounts of particulate pollution. Thus, the identified native trees in the mine area may be encouraged for plantation. Tree species having small leaf area, dense hair on leaf surface (rough surface), deep channels on leaves should be included for plantation, (vii) Vetiver plantation on inactive dumps may be encouraged as the grass species has high strength of anchoring besides medicinal value, (viii) Details of compensatory afforestation done should be recorded and documented by respective forest divisions, and State Forest Department should present mine-wise annual status, along with expenditure details, (ix) Similarly, Wildlife Department is also required to record and document annual status of wildlife in the region and should identify the need for wildlife management on regional level, (x) Maintenance of the ecology of the region is prime responsibility of the State Forest and Wildlife Department. They need to periodically review the status and identify the need for further improvement in the region. The required expenditure may be met from the funds already collected in the form of compensatory afforestation and wildlife management. Further, additional fund, if required can be sought from DMF. Responsibility: Individual Mine Lease Holders and State Forest & Wildlife Department.

27. **Socio-Economic Related:** (i) Public interaction should be done on regular basis and social welfare activities should be done to meet the requirements of the local communities. Further, basic amenities and infrastructure facilities like education, medical, roads, safe drinking water, sanitation, employment, skill development, training institute etc. should be developed to alleviate the quality of life of the people of the region, (ii) Land outees and land losers/affected people, if any, should be compensated and rehabilitated as per the national/state policy on Resettlement and Rehabilitation, (iii) The socioeconomic development in the region should be focused and aligned with the guidelines/initiatives of Govt, of India/ NITI Aayog / Hon'ble Prime Minister's Vision centring around prosperity, equality, justice, cleanliness, transparency, employment, respect to women, hope etc. This can be achieved by providing adequate and quality facilities for education, medical and developing skills in the people of the region. District administration in association with mine lease holders should plan for *"Samagra Vikas"* of these blocks well as other blocks of the district. While planning for different schemes in the region, the activities should be prioritized as per Pradhan Mantri Khanij Kshetra Kalyan Yojna (PMKKKY), notified by Ministry of Mines, Govt, of India, vide letter no. 16/7/2017-M.VI (Part), dated September 16, 2015. Responsibility: District Administration and Individual Mine Lease Holders.

28. **Road Transport Related:** (i) All the mine lease holders should follow thesuggested ore transport mode (SOTM\ based on its EC capacity within next 5 years, (ii) The mine lease holders should ensure construction of cement road of appropriate width from and to the entry and exit gate of the miner as suggested in Chapter 10. Further, maintenance of all the roads should be carried out as per the requirement to ensure dust free road transport, (iii) Transportation of ore should be done bv covering the trucks with tarpaulin or other suitable mechanism so that no spillage of ore/dust takes place. Further, air quality in terms of dust, PMin should be monitored near the roads towards entry & exit gate on regular basis, and be maintained within the acceptable limits. Responsibility: Individual Mine Lease Flolders and Dept, of Steel & Mines.

29. **Occupational Health Related:** (i) Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects periodically, (ii) Occupational health surveillance program for all the employees/workers (including casual workers) should be undertaken periodically (on annual basis) to observe any changes due to exposure to dust, and corrective measures should be taken immediately, if needed, (iii) Occupational health and safety measures related awareness programs including identification of work related health hazard, training on malaria eradication, HIV and health effects on exposure to mineral dust etc., should be carried out for all the workers on regular basis. A full time qualified doctor should be engaged for the purpose. Periodic monitoring (on 6 monthly basis) for exposure to respirable minerals dust on the workers should be conducted, and record should be maintained including health record of all the workers. Review of impact of various health measures undertaken (at an interval of 3 years or less) should be conducted followed by follow-up of actions, wherever required. Occupational health centre should be established near mine site itself. Responsibility: Individual Mine Lease Holders and District Administration (District Medical Officer),

30. **Reporting of Environmental Sustainability Achievement:** All the mines should prepare annual environmental sustainability report (ESR), highlighting the efforts made towards environmental protection with respect to different environmental components vis-a-vis production performance of the mine on monthly basis. The data collected as per EC and CTE/CTO conditions should be utilized to prepare the annual sustainability report. The mines performing high with effective environmental safeguards may be suitably recognized/rewarded. "Star Rating Format" formulated by the Ministry of Mines along with environmental sustainability report may be used,

31. **Environmental Monitoring Requirements at Regional Level:** Apart from strict compliance and monitoring by individual mine lease holder, there is a need for simultaneous monitoring in each of the regions by competent expert agencies under the guidance/ supervision of concerned regulatory agency. Details of the studies required to be done on regular basis (continuously for 5 years) through responsible agency (organization of national/state repute) and time frame are suggested in Table.

Table: Suggested Environmental Monitoring Requirements and Action Plans at

Sl. No.	Study component / Action Plan	Responsibility	Monitoring and Reporting Time Frame (Approx.)

Sl. No.	Study component / Action Plan	Responsibility	Monitoring and Reporting Time Frame (Approx.)
1.	Environmental Quality Monitoring with respect to Air, Water, Noise and Soil Quality in each region (Joda, Koira and Baripada/Rairangpur) as per specified frequency shall be done by a third party (preferably Govt.) and/or laboratory approved/ recognized by NABET/ CPCB/ SPCB/ MoEF&CC. All the water bodies (rivers, nalias, ponds etc.) shall be monitored. National/State level research/ academic institutes may be involved initially for couple of years to streamline the activity. The report shall be brought out annually by June each year. The study shall be conducted in consultation with MoEF&CC-RO.	SPCB	Continuous Annually
	Installation of online ambient air quality monitor for PM1 0. PMP.S, SOx and NOx within the mine havina more than 3 MTPA EC Caoacitv	Respective Mine Lease Holders	Continuous Annually
	Installation of online ambient air quality monitor for PM_{10}, $PM_{2.5}$, SOx and NOx in the Joda and Koira Region (total 11 locations.	SPCB	Continuous Annually
2.	Status of flora and fauna in each of the regions shall be assessed on annual basis. Changes, if any, taking place in the region shall be brought out clearly. The study shall be conducted in consultation with State Forest and Wildlife Department.	State Forest & Wildlife Dept.	Annually in mining zone and once in 3 years in the region
3.	Socio-economic study incorporating developments taking place in each of the region, CSR initiatives made by the mining companies shall be conducted on annual basis. Further, micro level developmental needs shall be clearly brought out in the report for each region. The study shall be conducted in consultation with district administration.	Respective District Administration	Annually

Sl. No.	Study component / Action Plan	Responsibility	Monitoring and Reporting Time Frame (Approx.)
4.	A detailed hydro-geological study in each of the regions shall be conducted in an integrated manner in consultation with Regional Director, Central Ground Water Board. Accordingly, all project proponents shall implement suitable conservation measures to augment ground water resources in the area.	SPCB	Once in 2 years
5.	The State Govt. shall ensure construction and maintenance of dust free common roads/ appropriate rail network for transport of ore from mines to the consumer end.	Dept. of Steel & Mines	12 months for road network and 5-7 years for rail network
6.	Construction and maintenance of dust free roads from respective mine to the main road	Respective Mine Lease Holders	Continuous 6 months
7.	Traffic/road inspection study addressing the condition of traffic/roads leading to different mines and connecting to different railway sidings shall be undertaken on annual basis. Further, detailed traffic study shall be undertaken on every 5 yearly basis to ensure adequacy of road/rail infrastructure in each of the regions. The study can be undertaken through national/ state level research/ academic institute (such as CSIR-CRRI, New Delhi).	Dept. of Steel & Mines	Continuous 6 months
8.	Assessment of land use/ land cover changes in each of the regions, with particular focus on mining areas, afforestation activities, variation in flow path of various water bodies etc. using remote sensing data	ORSAC	Annually
9.	R&.D Studies for utilization of low-grade iron ore	Dept. of Steel & Mines through R&D / Academic Institutes	Upto 45% by 2020 and upto 40% by 2025

The data so generated for the region should be made available on the website of Department of Steel & Mines and also at MoEF&CC website, so that it can be effectively utilized by Individual Mine Lease Holders for preparing EIA/ EMP reports. This will meet the requirement for separate one season baseline environmental quality data collection by the

individual proponents, if the mine proposed is in the same study region. Further. MoEF&CC fthrouah EAC1 can also utilize the data base available in evaluating the proposals for expansion of existing mines or new mines while granting ToR or EC to the mine, taking an holistic view of the region. State Govt, of Odisha should bring out an integrated environmental sustainability report for each of the regions (mainly for Joda and Koia region) incorporating ESR of individual mines and data collected in the region through various agencies, once in 5 years, to plan level of scientific and sustainable mining for the next 5 years.

32. Institutional Mechanism for Implementation of Environmentally Sustainable Mining: The present study is not a one-time study, but a process to ensure environmentally sustainable mining activities in the region on long term basis. Looking into the large-scale mining activities and long term perspective for mining vis-a-vis environmentally sustainable mining and upiiftment of people of the region, there is a need to create an agency, who will integrate all the aspects relating to sustainable mining in the region on long term basis. It could be a SPV of Govt, of Odisha or a cell within the overall control and supervision of Dept, of Steel & Mines, with members from

    IBM, GSI, OSPCB, MoEF&CC-RO and other concerned Departments and Mine Owners (EZMA), District Administration. It is found that the strong database available for the region needs to be taken into account to map and establish environmental quality of the region on daily, monthly, seasonal and annual basis. Further, the efforts and initiatives of the mines towards environmental protection as well as upliftment of the people of the region are required to be integrated, and a systematic plan at the block/regional level needs to be framed for the overall benefit of the local society, region, district, state and the country as a whole. It will be desirable to have proper environmental quality data management and analysis by NEERI or any other agency for next 5 years (six monthly compliance reports followed by field verification) ensuring sustainable mining practices in the region leading to an overall development of the region. District Mineral Funds should be utilized appropriately for various developmental activities/needs of the region. Further, an environmental sustainability report incorporating environmental status of region coupled with social upliftment may be brought out by SPCB or any other authorized agency on annual basis. This report can be used for supporting the regional EIA study, and also need for environmental quality monitoring by individual mine seeking environmental clearance for new mine/ expansion of mine, including public hearing. Since, outcome of the above study reports shall be in the overall interest of all the stakeholders (including local population) of the region, further planning for the region shall warrant cooperation and assistance of all the stakeholders (mine operators, industries, transporters, State & Centra! Government Offices, MoEF&CC, CPCB, SPCB, Dept, of Steel & Mines, IBM, IMD, NGOs and local people) in sharing the relevant data/information/ reports/documents etc. to continuously improve upon the environmentally sustainable development plan for economic growth in mining sector as well as for improvement in quality of life of the people of the region.

C. Besides the above, the below mentioned genera! points are also to be followed:-

a) All documents to be properly referenced with index and continuous page numbering.

b) Where data are presented in the Report especially in Tables, the period in which the data were collected and the sources should be indicated.

c) Project Proponent shall enclose all the analysis/testing reports of water, air, soil, noise etc. using the MoEF&CC/NABL accredited laboratories. All the original analysis/testing reports should be available during appraisal of the Project.

d) Where the documents provided are in a language other than English, an English translation should be provided.

e) The Questionnaire for environmental appraisal of mining projects as devised earlier by the Ministry shall also be filled and submitted.

f) While preparing the EIA report, the instructions for the Proponents and instructions for the Consultants issued by MoEF vide O.M. No. J-11013/41/2006- IA.II (I) dated 4th August, 2009, which are available on the website of this Ministry, should be followed.

g) Changes, if any made in the basic scope and project parameters (as submitted in Form-I and the PFR for securing the TOR) should be brought to the attention of MoEF&CC with reasons for such changes and permission should be sought, as the TOR may also have to be altered. Post Public Hearing changes in structure and content of the draft EIA/EMP (other than modifications arising out of the P.H. process) will entail conducting the PH again with the revised documentation.

h) As per the circular no. J-11011/618/2010-IA.II (I) dated 30.5.2012, certified report of the status of compliance of the conditions stipulated in the environment clearance for the existing operations of the project, should be obtained from the Regional Office of Ministry of Environment, Forest and Climate Change, as may be applicable.

i) The EIA report should also include (i) surface plan of the area indicating contours of main topographic features, drainage and mining area, (ii) geological maps and sections and (iii) Sections of the mine pit and external dumps, if any, clearly showing the land features of the adjoining area.

D. The prescribed TOR would be valid for a period of four years for submission of the EIA/EMP report.

ANNEXURE -C

CONDITIONS TO BE STIPULATED IN ENVIRONMENTAL CLEARANCE FOR DECORATIVE STONE MINES

A. Specific conditions

1. The Project Proponent shall obtain consent from the State Pollution Control Board, Odisha and effectively implement all the conditions stipulated therein.
2. Project Proponent shall appoint an Occupational Health Specialist for Regular and Periodical medical examination of the workers engaged in the Project and records maintained; also, Occupational health check-ups for workers having some ailments like BP, diabetes, habitual smokers, etc. shall be undertaken once in six months and necessary remedial/preventive measures taken accordingly. Recommendations of National Institute for Labour for ensuring good occupational environment for mine workers would also be adopted; All the old age people of the surrounding villages may be provided medical facilities.
3. Transport of minerals shall be done either by dedicated road or it should be ensured that the trucks/dumpers carrying the mineral should not be allowed to pass through the villages. The Project Proponent shall ensure that the road may not be damaged due to transportation of the mineral; and transport of minerals will be as per IRC Guidelines with respect to complying with traffic congestion and density.
4. Project Proponent shall ensure the safeguard and wellbeing of villagers and school, regular health monitoring of all residents in the area and the compliance Report shall be submitted to the Regional office of the Ministry and SEIAA, Odisha.

B. Standard conditions

1. A Final Mine Closure Plan along with details of Corpus Fund shall be submitted to the SEIAA, Odisha 5 years in advance of final mine closure for approval.
2. No mining activities will be allowed in forest area, if any, for which the Forest Clearance is not available.
3. No change in mining technology and scope of working should be made without prior approval of the SEIAA, Odisha.
4. No change in the calendar plan including excavation, quantum of mineral and waste should be made.
5. The project proponent shall obtain necessary prior permission of the competent authorities for drawl of requisite quantity of water (surface water and ground water) for the project.
6. Mining shall be carried out as per the provisions outlined in the approved mining plan as well as by abiding to the guidelines of Directorate General Mines Safety (DGMS).
7. Protection of vegetation in the surrounding areas, and proper storage of solid waste, subgrade ore and their use have to be given priority during mining operation.
8. Digital processing of the entire lease area using remote sensing technique shall be

carried out regularly once in three years for monitoring land use pattern and report submitted to Ministry of Environment, Forest and Climate Change its Regional Office and SEIAA, Odisha.

9. Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of PM10 and PM2.5 such as haul road, loading and unloading point and transfer points. Fugitive dust emissions from all the sources shall be controlled regularly. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the Central Pollution Control Board in this regard. Monitoring of Ambient Air Quality to be carried out based on the Notification 2009, as amended from time to time by the Central Pollution Control Board.

10. Regular monitoring of ground water level and quality shall be carried out in and around the mine lease by establishing a network of existing wells and constructing new piezometers during the mining operation. The project proponent shall ensure that no natural water course and/or water resources shall be obstructed due to any mining operations. The monitoring shall be carried out four times in a year pre- monsoon (April-May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to Ministry of Environment, Forest and Climate Change and its Regional Office, Central Ground Water Authority and Regional Director, Central Ground Water Board.

11. Transportation of the minerals by road passing through the village shall not be allowed. A 'bypass' road should be constructed (say, leaving a gap of at least 200 meters) for the purpose of transportation of the minerals so that the impact of sound, dust and accidents could be mitigated. The project proponent shall bear the cost towards the widening and strengthening of existing public road network in case the same is proposed to be used for the Project. No road movement should be allowed on existing village road network without appropriately increasing the carrying capacity of such roads.

12. The illumination and sound at night at project sites disturb the villages in respect of both human and animal population. Consequent sleeping disorders and stress may affect the health in the villages located close to mining operations. Habitations have a right for darkness and minimal noise levels at night. PPs must ensure that the biological clock of the villages is not disturbed; by orienting the floodlights/ masks away from the villagers and keeping the noise levels well within the prescribed limits for day light/night hours.

13. Sufficient number of Gullies to be provided for better management of water. Regular Monitoring of pH shall be included in the monitoring plan and report shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.

14. There shall be planning, developing and implementing facility of rainwater harvesting measures on long term basis and implementation of conservation measures to augment ground water resources in the area in consultation with Central Ground Water Board.

15. The Project Proponent has to take care of gullies formed on slopes. Dump mass should be consolidated with proper filling/leveling with the help of dozer/compactors.

16. The reclamation at waste dump sites shall be ecologically sustainable. Scientific reclamation shall be followed. The local species may be encouraged and species are so chosen that the slope, bottom of the dumps and top of the dumps are able to sustain these species. The aspect of the dump is also a factor which regulates some climatic

parameters and allows only species adopted to that micro climate.

17. The top soil, if any, shall temporarily be stored at earmarked site(s) only and it should not be kept unutilized for long. The topsoil shall be used for land reclamation and plantation. The over burden (OB) generated during the mining operations shall be stacked at earmarked dump site(s) only and it should not be kept active for a long period of time. The maximum height of the dumps shall not exceed 8m and width 20 m and overall slope of the dumps shall be maintained to 45°. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas, use of geo textiles shall be undertaken for stabilization of the dump. The entire excavated area shall be backfilled and afforested. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.

18. Catch drains and siltation ponds of appropriate size shall be constructed around the mine working,mineral and OB dumps toprevent run off of water and flow of sediments directly into the river and other water bodies. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains shall be regularly desilted particularly after monsoon and maintained properly. The drains, settling tanks and check dams of appropriate size, gradient and length shall be constructed both around the mine pit and over burden dumps to prevent run off of water and flow of sediments directly into the river and other water bodies and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits shall be constructed at the corners of the garland drains and desilted at regular intervals.

19. Plantation shall be raised in a 7.5m wide green belt in the safety zone around the mining lease, backfilled and reclaimed area, around water body, along the roads etc. by planting the native species in consultation with the local DFO/Agriculture Department and as per CPCB Guidelines. The density of the trees should be around 2500 plants per ha. Greenbelt shall be developed all along the mine lease area in a phased manner and shall be completed within first five years.

20. The Project Proponent shall make necessary alternative arrangements, where required, in consultation with the State Government to provide alternate areas for livestock grazing, if any. In this context, Project Proponent should implement the directions of the Hon'ble Supreme Court with regard to acquiring grazing land. The sparse trees on such grazing ground, which provide mid-day shelter from the scorching sun, should be scrupulously guarded against felling and plantation of such trees should be promoted.

21. The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna, if any, spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. A copy of action plan shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office.

22. As per the Company Act, the CSR cost should be 2 % of average net profit of last three years. Hence CSR expenses should be as per the Company Act/Rule for the Socio

Economic Development of the neighborhood Habitats which could be planned and executed by the Project Proponent more systematically based on the 'Need based door to door survey' by established Social Institutes/Workers. The report shall be submitted to the Ministry of Environment, Forest and Climate Change and its Regional Office on six monthly basis.

23. 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.

24. Measures should be taken for control of noise levels below 85 dBA in the work environment. Workers engaged in operations of HEMM, etc. should be provided with ear plugs / muffs.

25. Personnel working in dusty areas should wear protective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

26. The project authorities should inform to the Regional Office regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.

27. The project proponent shall submit six monthly reports on the status of the implementation of the stipulated environmental safeguards to the Ministry of Environment, Forest and Climate Change, its Regional Office, Central Pollution Control Board and State Pollution Control Board.

28. A copy of clearance letter will be marked to concerned Panchayat / local NGO, if any, from whom suggestion / representation has been received while processing the proposal.

29. State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/ Tehsildar's Office for 30 days.

30. The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at web site of the Ministry of Environment, Forest and Climate Change at www.environmentclearance.nic.in and a copy of the same should be forwarded to the Regional Office.

31. The SEIAA, Odisha may alter/modify the above conditions or stipulate any further condition in the interest of environment protection.

32. Any appeal against this clearance 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.

33. The above mentioned stipulated conditions shall be complied in a time-bound manner. Failure to comply with any of the conditions mentioned above may result in cancellation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

Environmental Scientist, SEAC