

EXECUTIVE SUMMARY FOR DEVELOPMENT AND OPERATION OF KUTRUMALI BAUXITE BLOCK

DEVELOPMENT AND OPERATION OF KUTRUMALI BAUXITE BLOCK FOR PRODUCTION OF 4.00 MTPA BAUXITE (ROM), OVER A MINING LEASE AREA OF 701.792 HA AT VILLAGE-KUTRUMALI, LELINGAPADAR, RAKHIGURHA AND BHIKAPANGA, TEHSIL-THUAMUL RAMPUR & KASHIPUR, DISTRICT-KALAHANDI & RAYAGADA, ODISHA

(Project is listed under activities 1(a) Mining of Minerals under the Schedule of EIA Notification, 2006 and categorized as Category-A.)

STUDY PERIOD: OCTOBER TO DECEMBER 2023

2024

APPLICANT

**Kalinga Alumina Limited
(formerly known as Mundra Aluminum Limited)
Adani Corporate House, Shantigram
Near Vaishno Devi Circle, S.G. Highway,
Khodiyar Ahmedabad – 382421, Gujarat, India**

ENVIRONMENT CONSULTANT

**VARDAN ENVIRONET
(QCI/NABET ACCREDITED NO: NABET/EIA/2326/RA 0284)
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EXECUTIVE SUMMARY

1. INTRODUCTION

The chapter discusses about the summary of whole EIA/EMP report along with recommendation and conclusion. The Government of Odisha, issued letter of intent vide letter SM-MC2-MC-0003-2023/2040/S&M Bhubaneswar dated 27th February 2023 for grant of mining lease for Kutrumali bauxite block for an area of 701.792 ha. Out of the total 701.792 Ha Lease Area, 198.847 ha of forest land and 502.945 ha of non-forest land. Application for the diversion of 199.776 Ha of forest land (198.847 Ha within Mining Lease Area and 0.929 Ha in approach road outside the Mining Lease area) has been submitted vide proposal no. FP/OR/MIN/QRY/473248/2024 Dtd. 24th May, 2024 and listed for PSC I.

The present proposal for the mining of Bauxite by opencast mining method with an annual Peak Rated Capacity of 4.0 MTPA of Bauxite (ROM). Mining Plan along with Progressive Mine Closure Plan (PMCP) has been approved by IBM, Ministry of Mines, GoI, vide Letter No. MCDR-MiFLOBXT/8/2023-BBS-IBM_RO_BBS; dated 22-11-2023.

Terms of References (ToR) for the project was granted by Ministry of Environment, Forest & Climate Change (MoEF&CC) vide letter IA-J-11015/7/2024-IA-II(NCM) dated 22.02.2024.

The project envisages;

- Production of 4.00 MTPA Bauxite (ROM) and total 5.713 Mm³ or 11.426 MT Overburden/waste (in first five years).
- Setting up of Crushing/screening facilities at pit head with capacity of 800 TPH (2 X 400 TPH).
- Other mining infrastructure and utilities as required for mining activities.

The proposed project is listed under activities 1(a) under the Schedule of EIA Notification, 2006 and categorized as Category-A.

2. PROJECT DESCRIPTION

The proposed project entails mining of Bauxite by opencast mining method with an annual Peak Rated Capacity of 4.0 MTPA of Bauxite (ROM). The project also involves generation of 11.426 MT of Overburden/waste during (initial 5 years of operations) and no top soil will be generated during the plan period. Besides, it is envisaged to have crushing/Screening facilities within the lease area with a capacity of 800 TPH at rated production level over an area of 701.792 Ha located at Village-Kutrumali, Lelingapadar, Rakhigurha and Bhikapanga, Tehsil-Thuamul Rampur & Kashipur, District-Kalahandi & Rayagada, Odisha between latitudes 19°29'0.825"N to 19°25'50.288"N and Longitude



83°13'10.222"E to 83°10'17.920"E and is covered under Survey of India toposheet no. No. E44F3 (65M/3). Detail of the project is summarized in below attached table:

Table 1: Details of the Project

S. No.	Description	Particulars
1.	Name of the Project	Kutrumali Bauxite block
2.	Type of the Project	Mechanized Opencast (HEMM with deephole drilling)
3.	Mining lease area	701.792 Ha
4.	Forest Area	198.847 Ha. (Pertaining to Mining Lease area)
5.	New / Expansion	New
6.	Category as per EIA Notification	"A"
7.	Location	
8.	Villages	Kutrumali, Lelingapadar, Rakhigurha and Bhikapanga
	Tehsil	Thuamul Rampur and Kashipur
	District	Kalahandi and Rayagada
	State	Odisha
	Latitude	19°29'0.825"N to 19°25'50.288"N
	Longitude	83°13'10.222"E to 83°10'17.920"E
	Toposheet No.	E44F3 (65M/3)
9.	Name of the Organization	M/s. Kalinga Alumina Limited
10.	Capacity of Mine	4 MTPA
11.	Total Mineral Resource	127.737 MT
12.	Percentage of extraction	85.84 %
13.	Quality/ Grade	Avg. grade, 39.60% Al ₂ O ₃ and 2.08% SiO ₂
14.	Prefeasibility Mineral Resource	7.444 MT
15.	Inferred Mineral Resource	10.646 MT
16.	Probable Resource	109.647 MT
17.	Life of Mine	29 Years
18.	Average stripping ratio	0.71:1 (t/t) (OB to Ore ratio)
19.	Life of Mine	29 years
20.	External Dump area	24.87 Ha and 30 m (3 stages with terrace height of



S. No.	Description	Particulars
	and height	10m each)
21.	Internal Dump area and height	25.55 Ha and 30 m (3 stages with terrace height of 10m each)
22.	Void area	376.133 Ha
23.	Details of Wildlife Sanctuaries, National Park, eco-sensitive Zones, within 10 km radius?	None
24.	R & R Involved	One human settlement is present within the mine lease area, which will be relocated under R&R Plan. Based on available information an estimated 82 families shall be project affected families (PAFs).
25.	No. of affected families	82 no. of PAFs due to proposed project for which R&R plan will be prepared.
26.	Technology	Opencast mechanized mining is proposed
27.	Area of Excavation	56.18 Ha
28.	Depth of the quarry	51 m
29.	Total Plantation	54,822
30.	Density of Plantation	2000 No./ha
31.	Evacuation	
	In-Pit	Dumpers
	Surface to Siding	Trucks
	Siding to Loading	Trucks
32.	Employment potentiality	Total 246 (Direct)
33.	Power Requirement & Source	The estimated peak power requirement will be 1.5 MW. Which will be sourced from nearest substation at Kashipur, located at a distance of 15 km.
34.	Water Requirement and Source	Water requirement during construction phase (domestic and construction activity) is estimated as average 15 KLD with a peak consumption of 30 KLD. The water requirement during mine operation is 750 KLD. 720 KLD will be sourced from nearby stream and 30 KLD will be recycled water retrieved from water treatment plant at workshop.
35.	Total cost of the project	Rs 425 Crores
36.	Fund Provision for EMP	Capital-102.75 Lakhs Recurring-10.58 Lakhs



S. No.	Description	Particulars
37.	Name of the EIA Consultant Organization	M/s Vardan EnviroNet
38.	QCI / NABET Accreditation	Certificate No. NABET/EIA/2326/RA 0284, Valid up to 04.05.2026

3. DESCRIPTION OF THE ENVIRONMENT

Environmental data have been collected in relation to proposed mining for Air, Noise, Water, Soil, Ecology and Biodiversity. The generation of primary data, as well as collection of secondary data and information from the site and surroundings was carried out during summer season, i.e. October 2023 to December 2023 by Vardan EnviroLab, NABL Accredited Lab, in accordance with the guidelines of EIA issued by the Ministry of Environment Forests and Climate Change, Govt. of India and CPCB, New Delhi. Secondary data was collected from different Government sources. The scope of the study has been done as per ToR letter. The EIA study is being done for the Mine Lease (core zone) and area within 10 Km distance from the mine lease boundary (buffer zone), both of which together comprise the study area.

Table 2: Baseline Environment Status

Parameters	Baseline Status (October to December 2023)
Ambient Air Quality	PM ₁₀ – 70.40 to 45.5 µg/m ³ PM _{2.5} – 44.80 to 27.20 µg/m ³ SO ₂ – 16.10 to 9.40 µg/m ³ NO _x – 28.80 to 16.1 µg/m ³ CO – 0.91 to 0.41 mg/m ³
Noise Level	The Leq values for Day Time: 40.20 to 49.36 dB (A). The Leq values for Night Time: 33.65 to 42.00 dB (A).
Water Quality	Ground Water: All the Parameters Like pH varies from 7.12 to 8.00, Total Hardness varies from 110.2 to 300.4 mg/mg/L, Total Dissolved Solids varies from 290 to 440 mg/l mg/L, etc. are found within the permissible limits. Surface Water: All the Parameters Like pH varies from 7.51 to 7.98, Total Hardness varies from 74 to 180 mg/L, Total Dissolved Solids varies from 240 to 400 mg/L, etc. are found within the permissible limits.

Parameters	Baseline Status (October to December 2023)
Soil Quality	pH- 7.54 to 7.84 Organic matter- 0.32% to 0.67% Available Nitrogen: 118.2 Kg/ha to 213 Kg/ha Available Phosphorus: 23.52 kg/ha to 42.98 kg/ha Available Potassium: 27.54 Kg/ha to 127.25 Kg/ha
Ecology and Biodiversity	No National Park, Wild Life Sanctuary, Bio-sphere Reserve, Elephant Reserve, Tiger Reserve or Elephant Corridor etc. is present within 10 km of mining lease area. However, Site Specific wildlife conservation plan for the Schedule-I species will be prepared as per the WPA Act, 2022 and will get approved by competent authority.
Socio Economic	The proposed project will provide positive impact to the nearby area. The project will provide direct and indirect employment to nearby villagers.

4. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

The proposed mining operations are not anticipated to raise the concentration of the pollutants beyond prescribed limits. However, the measures are suggested to mitigate any harmful impacts of pollutants, like the plantation of trees along haul roads especially near settlements, to help to reduce the impact of dust on the nearby villages; planning, transportation routes of mined material so as to reach the nearest paved roads by shortest route; regular water sprinkling on unpaved roads to avoid dust generation during transportation etc. The mining activities is likely to increase the per capita income of local people by which the socio-economic status of the people will be improved. The local people will be provided with either direct employments or indirect employment such as transport & other business, contract works and development work like roads, etc. and other welfare amenities such as medical facilities, conveyance, free education, drinking water supply etc. Except dust generation, there is no source which can show a probability for health related diseases. Regular water sprinkling will be done with water sprinklers and dust masks will be provided to the workers. All workers will be subjected to a medical examination as per Mines Rule 1955 both at the time of appointment and at least once in a year. Medical camps will be organized for this activity. Insurance for all employees as per the rules will also be carried out.



Table 3: Anticipated Environmental impacts and mitigation

Activity	Environmental Aspects	Impact	Impact characteristics	
			Significance	Mitigative measures
Mining				
Excavation	Excavation of area by Drilling, blasting and excavator, compressor and dumper combination	Air Pollution,	Significant	Dust curtains will be installed on drill rigs. Water injector will be used on drill rigs to minimize dust emission. Blast will only be conducted when meteorological conditions are favorable. Thick greenbelt will be developed.
	Mine runoff	Water Pollution	Significant	All the fines will be arrested in a very systematic established framework of protective measures like Garland drain, Gabion wall, retaining wall, check dam, settling tank, ETP and STP.
	Due to Drilling, blasting and excavator, compressor and dumper	Noise Pollution	Significant	Provision and maintenance of thick tree belts Proper maintenance of noise generating machinery including the transport vehicles. Provision of protective devices like ear muffs/ear plugs to workers. Confining the noise by isolating the source of noise
	Excavation of Graphite	Land use	Significant	Land will be covered with plantation after backfilling and stabilisation after due technical and biological reclamation.
Drilling	Generation of dust	Air pollution	Significant	Wet drilling method Introduction of dust suppression system Installation of permanent pipe water sprinkler along mine haul road and Development of green belt



Activity	Environmental Aspects	Impact	Impact characteristics	
			Significance	Mitigative measures
	Generation of Gaseous emissions	Air pollution (SO2/NOx/CO)	Insignificant	Regular maintenance of Drilling M/c to reduce gaseous emissions.
	Generation of Noise	Noise Pollution	Insignificant	Operator Cabin is enclosed. Ear muff shall be also be provided to the operator. Confining the noise by isolating the source of noise. Reducing the exposure time of workers to the higher noise levels.
Blasting	Dust generation	Air pollution	Significant	Controlled blasting with proper burden, spacing, safe charge and adequate stemming shall be done. Non electric (NONEL) initiation system shall be used
	Gaseous emission	Air pollution NOx / CO	Insignificant	Emulsion/slurry explosive/ ammonium nitrate fuel oil mixture (ammonium nitrate: fuel oil = 94:6 by weight) will be used
	Vibration & Air blast	Damage to nearby structures & buildings	Significant	Safe explosive charge will be decided based on Vibration study
	Fly rock generation	Potential for accidents (damage to equipment etc.)	Significant	Blasting Shelters will be provided Warning Signal will be placed Danger Zone shall be marked with Red Flag
Transportation of mineral	Dust generation	Air pollution	Significant	Water sprinkling will be done on haul road Transportation of Graphite ore within mining lease area will be done by dumpers (capacity-20 t)
	Gaseous emission	Air pollution SO2/NOx/CO/HC	Insignificant	Regular maintenance of Dumper / Tippers to keep emissions under control



Activity	Environmental Aspects	Impact	Impact characteristics	
			Significance	Mitigative measures
Transportation of waste-to-Waste Dump	Dust generation	Air pollution	Significant	Water sprinkling will be done on haul road The excavated waste and Graphite bearing material (GBM) would be transported to dump and stock yard respectively through covered trucks.
	Gaseous emission	Air pollution SO ₂ /NO _x /HC	Insignificant	Regular maintenance of Dumper / Tippers to keep emissions under control
Grading of Haul Road	Dust generation	Air pollution SPM/RPM	Insignificant	Operators are in closed cabins of Grader. Dust mask shall be provided
	Gaseous emission	Air pollution SO ₂ /NO _x /CO	Insignificant	Proper maintenance of Grader shall be done to keep emissions low.
	Noise generation	Noise pollution	Insignificant	Insignificant. No action needed. PPE shall be provided
Operation of Crusher				
Operation of Crusher	Generation of dust	Air Pollution,	Significant	Use of dust mask by crusher operator. Development of greenbelt. Sprinkling of water
	Generation of Noise	Noise Pollution	Significant	Use of ear muff near crusher Proper maintenance of crusher
DG Set				
DG Set	Flue gas emission, used oil generation	Air Pollution	Insignificant	The DG will be operated in case of power failure only. Green DG sets shall be installed



Activity	Environmental Aspects	Impact	Impact characteristics	
			Significance	Mitigative measures
	Generation of noise during DG Set operation	Noise Pollution	Significant	The DG Sets will have acoustic enclosure to minimize the noise.
Domestic Use				
Operation of domestic utilities	Washroom, toilets – Wastewater generation	Water Pollution	Significant	The sewage will be treated in septic tank.
Greenbelt Development				
Development and maintenance of Green Belt	Plantation of trees within premises. to cover 33% of the area	Reduction in Air Pollution and Noise Pollution	Insignificant	Positive Impact due to development of a proper green belt along the periphery of the premises. This will act as barrier for air emission and noise Mine area will be afforested after the end of mine life.
Socio-economic Development				
Employment Generation	Operation of mine	Socio-economic		Positive Impact due to direct employment of persons from the nearby area Substantial benefits in the form of contracts to local agencies for different services. Employment generation in transport sector for transportation of material.

5. ANALYSIS OF ALTERNATIVES

We have analyzed all the option for technology alternatives of the proposed project. Since it is a mineral specific project therefore analysis of alternative site is not applicable.



6. ENVIRONMENTAL MONITORING PROGRAM

In order to maintain the environmental quality within the stipulated standards, regular monitoring of various environmental components is necessary which will comply as per conditions. For this the lessee has taken the decision to formulate an Environment Policy of the mine and constitute an Environmental Management Cell and committed to operate the mine with the objectives mentioned in Environment Policy. EMP may also require measurement of ambient environmental quality in the vicinity of a site using ecological/biological, physical and chemical indicators. Monitoring may include socioeconomic interaction, through local liaison activities or even assessment of complaints. Regular Monitoring of all the environmental parameters viz., air, water, noise, SE, EB and soil, as per the formulated program based on CPCB and MoEF&CC guidelines will be carried out every year. The location of the monitoring stations will be selected on the basis of prevailing micro meteorological conditions of the area like; wind direction and wind speed, relative humidity, temperature.

7. ADDITIONAL STUDIES

Shall be incorporated after Public Hearing is conducted.

8. PROJECT BENEFIT

Project will generate employment for about 246 persons directly. In addition, more than 300-350 people will be benefited indirectly. Management will engaged the Skilled, semi-skilled and unskilled workers from the nearby villages. The company management will contribute to the Educational Development, Infrastructure Development etc. for the welfare of the villagers. It has proposed to plant 54822 no of trees till the plan period. The respective regulatory authority will strictly monitor the compliance of the mine lease in this regard. Other than this social development of the village will be considered as per social requirement of locality.

9. ENVIRONMENTAL MANAGEMENT PLAN

As per Above discussion there is no major impact on the environment due to mining except fugitive emission in the form of dust generated during mining and its allied activity. The adequate preventive measures will be adopted to contain the various pollutants within permissible limits. Plantation program will be carried out which will be an effective pollution mitigate technique, and help avoid soil erosion during monsoon season. Employment opportunities will be provided to the locals. A budget of Rs. 102.75 Lakhs as a capital cost and Rs. 10.58 Lakhs/year for recurring cost has been kept for EMP.



10. CONCLUSION

The industrial development and consequent economic development should lead to improvement of environment through better living and greater social awareness. With the progress in technology and processes, mining activities has gained a better traction and a higher productivity stance, our best solution lies in progressive & innovative planning along with a better environmental management and protection as a part and parcel of the mining system.

The proposed project will have impacts on surrounding environment as detailed in the report however the impacts can be minimized by effective implementation of Environment Management Plan and continuous monitoring of EMP to overcome any other remedial measures required as suggested in the EIA study. On the other hand, this project is likely to have several benefits like improvement in direct and indirect employment generation and economic growth of the area, by way of improved infrastructure facilities and better socio-economic conditions. Ultimately it gives financial and social benefits for the local people there by improving their standard of living in addition to that the project will contribute to ongoing efforts of the government to meet the national demand of Bauxite resources, therefore the proposal for the mining activity at Kutrumali Bauxite mine is crucial and has a socio-economics impact.

From the baseline study and various above discussions on the probable impacts of all the operational activity, it has been concluded that this project will have more positive impact and will generate the revenue and employment in the area. On the above facts and baseline study, the proposed activity is recommended for the commencement with proper mitigation measure as suggested.