**SUMMER SEASON 2022** 

## **EXECUTIVE SUMMARY**

# **ENVIRONMENT IMPACT ASSESSMENT REPORT**

FOR

### **KAMLESHWARPUR BAUXITE MINE**

Proposed Production Capacity: 461538.46 TPA (ROM), Mineral: 300000 TPA, Mineral Reject: 161538.5 TPA

Mining lease Area 147.625 ha.

At

Near Village- Kamleshwarpur & Rupakhar, Tehsil - Mainpat, District- Surguja, Chhattisgarh

By

M/s. Chhattisgarh Mineral Development Corporation Limited

**Project Cost: Rs. 7.5 CRORE** 

Category-B1

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Project File ID: OMTC/EIA/2022/43



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#### **EXECUTIVE SUMMARY**

#### **1.0 Introduction**

Environmental Impact Assessment (EIA) is a systematic and integrative process for considering possible impacts prior to a decision being taken on whether or not a proposal should be given approval to proceed.

The proposed project has mining lease area of 147.625 hectare and as per EIA Notification of the MoEF&CC dated 14.09.2006, as amended on 1.12.2009, 4.04.2011, 20th April, 2022; the proposed project falls under Category "B" and obtaining prior environmental clearance is mandatory. Accordingly, ToR was applied in the Month of Aug 2022 and the project was granted Terms of Reference (TOR) by State Expert Appraisal Committee (Mining), MoEF&CC on 18.10.2022 (Refer Annex 1.1) bearing file number SIA/CG/MIN/82957/2022

#### 2.0 Project Description

The proposed project is bauxite mining project. The total mining lease area is 147.625 ha and consists of revenue private and land with mineral deposit of Bauxite, occurring in the ML area. The proposed capacity of the mines is 461538.46 TPA. The estimated cost of the project is about Rs. 7.5 crores. The lease area falls under the Survey of India topo sheet no. 64N/5. The state govt. has issued Letter of Intent (LOI) vide order no F3-12/2021/12, dated 13/04/2022.

#### **3.0 Project Proponent**

Chhattisgarh Mineral Development Corporation (CMDC), Raipur has been allotted Mining Lease (ML) at Kamleshwarpur for Bauxite Mining is a fresh grant located in Village-Kamleshwarpur & Rupakahar, under Tehsil- Mainpat, District- Surguja, Chhattisgarh. The lease area is of 147.625 Ha and project Category is B1. Opencast Semi-Mechanized Mining method will be adopted for this project.

#### 4.0 Location of the Project

The proposed mine is located near village- Kamleshwarpur & Rupakahar, Tehsil- Mainpat, District- Surguja, State-Chhattisgarh over an area of 147.625 Ha.

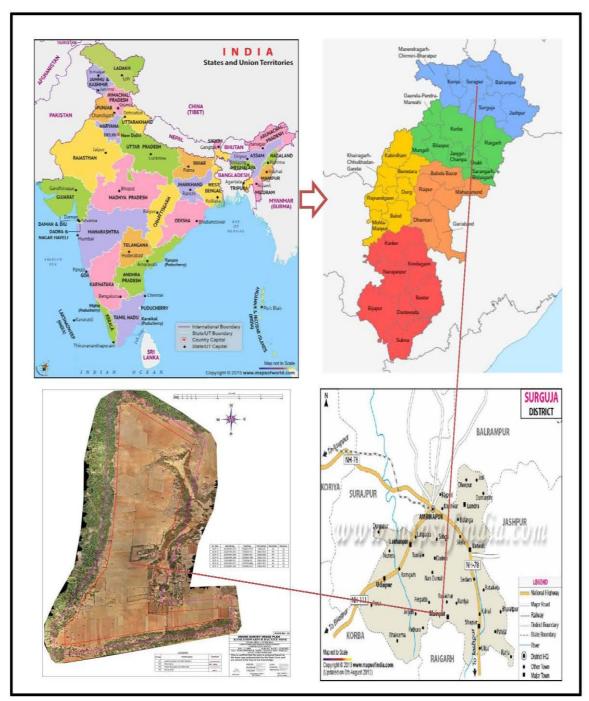


Figure ES-1: Location of Mine in Surguja District

#### **5.0 Salient Features of the Project**

S. No.	Particulars	Details
1	Total Mine Lease Area	147.625 Ha.
2	Lease period validity	2022-2023 to 2072-2073
3	SOI Topo Sheet	64N/5
4	Elevation above MSL	Highest MSL 1068
		Lowest MSL 1032 m

S. No.	Particulars	Details				
5	Present Land Use	Agriculture				
6	Nearest Highway	Tar road near the mine area with good condition. NH 43 at				
		25 km, Raipur-Ambikapur - NH-30 approx. 14 km				
7	Nearest Railway Station	Ambikapur Railway station approximately 45 km.				
8	Nearest Airport	Ambikapur Airport approximately 22 km				
9	Nearest Port	Dhamra Port Approx. 440 Km.				
10	Nearest Town/City	Mainpat Tehsil at 7 km (approximately)				
11	Nearest Villages	Kamleshwarpur & Rupakhar				
12	Villages with ML area	Nil				
13	Archaeologically important places	Nil in ML Area. Tibetan Pagodas (Temples) approx. 20 km.				
14	National parks/ wildlife sanctuaries	Nil				
15	Reserved/protected forest	Kumarta Reserved Forest 500m away from ML area in south of Mainpat Block				
16	State and national boundaries	Jharkhand State Boundary-91.0km; Maharashtra-315 km; Madhya pradeh-136 km; Uttar Pradesh -120km Odisha – 80 km; National Boundary 450 km SE				
17	Streams / Rivers/Drainage Pattern	Nil within MLungata nala is about 1.75 km. SE Direction. Drainage pattern is Dendritic & Radial, first order more than 3 km away				
18	Powertransmissionlines/telephonelines	Electric line passing with in the mining lease area mark in Surface plan. Ropakhar sub-station approx. 2 km.				
	Défense Installations	Nil				
19	Seismicity	Seismically, this area is categorized under zone-II as per IS- 1893 (Part-I)-2002.				
20	Nearby mines	Nil				
21	Cost of the Project	7.5 crore				
22	Water Requirement	6.5 KLD				
23	Source of Water	Will be fulfilled from local supplier.				

#### 6.0 Topography

In the regional topography, elevation of Mainpat Plateau is about 1068 m MSL. The highest elevation in the plateau is 1,116 m to the north of Kamleshwarpur. The plateau extends about 40 kms in length towards east-west direction and about 14 kms in width towards north-south direction and is characterized by steep scarps along its edges. At places, these scarps are dissected by steep valleys which in certain places are up to 150 m deep. The applied lease area is a part of Mainpat Plateau; the topography is a dissected plateau and sloping towards southern direction. The lease area has been surveyed during prospecting by CMDC on a scale of 1:4,000 with contour interval of one meter. The mining site has a slope towards south direction and no rain water pools in the lease area.

#### 7.0 Drainage in the study

No perennial nala is flowing within the lease area. The main drainage of the area is through different seasonal water courses originating from the plateau. Streams of the plateau exhibit a combination radial and dendritic pattern. A main nala Gungata is about 3 km on the northern side of the area, flowing towards northern direction and meets to Gungata Nala..

#### 8.0 Quality of Reserves

The reserves and resources have been estimated as per the data given in the Prospecting Report. During prospecting the cut-off grade of bauxite is considered as Al2O3 minimum 40%, while for the preparation of this Mining Plan the reserve has been estimated as per the threshold value of Al2O3 30% with reactive silica 5%. Geological mapping and exploratory drilling were done in the year 2009-11 by CMDCChhattishgarh,384 bore holes were explored of 5588.50 meters depth in 147.625 HA area and showed the presence of bauxite ,3583 samples were collected and analysed. Bauxite deposit occurs as pocket and lenses form. The strike length of the ore body is 1399m approx. and width of the ore body is 0.47 to 0.54 and thickness of the ore body is 8.0 m (average).

	Code	Quantity			Grade	
Classification		Forest	Non-Forest	Total	Forest	Non- Forest
A. Mineral Reserve						
<b>1. Proved Mineral Reserve (A)</b>	111					
2. Probable Mineral Reserve (A)	121					
3. Probable Mineral Reserve (A)	122		7119417.03	7119417.03		A12O3 30% & above
<b>B. Remaining Resources</b>						
<b>1. Feasibility Mineral Resource (B)</b>	211					
2. Prefeasibility Mineral Resource (B)	221					
3. Prefeasibility Mineral Resource (B)	222		392905.55	392905.55		A12O3 30% & above
4. Measured Mineral Resource (B)	331					
5. Indicated Mineral Resource (B)	332				-	
6. Inferred Mineral Resource (B)	333		1279863.37	1279863.37		
7. Reconnaissance Mineral Resource (B)	334				-	
<b>Total Mineral Resources (A+B)</b>			9,185,091.47	9,185,091.47		

Table ES-2: Mineral reserve along with cut off Grade

Source: Consultants Team

#### 9.0 Proposed Method of Mining

The proposed method of mining will be opencast method with drilling, blasting, manual sizingsorting and transportation by excavator-dumper combination. After the blasting 65 % ore are recoverable and that is saleable ore and remaining 35 % are intercalated waste will be sorted out by manual labors. The high alumina and low-alumina bauxite will be sorted through handpicking by the experience labour.

The proposed mining will be open cast. The Semi-Semi-Mechanized method with drilling and blasting will be adopted. The infrastructure facilities like office, rest shelter, maintenance shed, urinal etc will be provided before commencement of the mining operation. A haulage road already exists for movement of vehicles.

Work related to overburden removal, production and dispatch of bauxite will be carried out in systematic manner, smaller size excavator of 2.0 cum bucket size, and dumper 18 tonne will be used for overburden removal, and 100 mm dia DTH drills of 25t capacity will be used for drilling. The working will be carried out in single shift. The blast holes of 3 to 4 m depth shall be drilled by DTH drills, for blasting required for loosening of hard overburden and ore bench.

Thereafter where the soft overburden is available; it is excavated by excavator dumper combination and used for backfilling of mined out area. The top soil and soft overburden (SOB) shall be scrapped separately, but there is a single bench for both.

The hard overburden shall be drilled, blasted for loosening and shifted by excavator dumper combination to backfill the mined-out area. After removal of the overburden, the exposed ore zone having grade above 40%  $Al_2O_3$  shall be excavated, after loosening by drilling blasting. Thereafter, sizing & sorting of blasted ore is being done at working face itself. The boulder above 600 mms size is reduced to (-) 600 mms size by hydraulic rock breaker before manual sizing/ sorting.

After removal of bauxite the mined-out areas are concurrently backfilled with generated OB (hard /soft laterite), reject material, and top soil. The backfilling of materials shall be done in same sequence as it is found in the nature, i.e., hard laterite in bottom, then soft laterite and top soil. Levelling and compaction of backfilled area is being done from time to time by dozer so as to restore the topography in its original shape.

Therefore, here we considered 30% and above as ore zone for bauxite. For the resource categorisation, three categories of bauxite resources adopted for the best uses namely more than 40% Al2O3, 35 to 40% Al2O3 and 30 to 35% Al2O3 & The cut-off of saleable bauxite is considered as 30% Al2O3 & above and maximum SiO2 will be 5%.

During the mining it is found that, the estimated recovery factor of saleable grade bauxite is 65% of total material. Out of total 100% ore zone, the 65% material will be saleable bauxite and rest 35% will be waste/rejects. The material of quality above 38% alumina will be stacked after it's sizing & sorting. During the mining of graded bauxite, the cut-off grade quality 40% alumina if encountered will be separated out and blended with high grade mineral, hence no separate stock is required. The left-out material will be as reject and will be transported to mined-out area for backfilling use..

#### **10.0 Land Environment Mine Lease Area**

The entire lease holds area of 147.625 Ha. (Private land 1.779 Ha and govt. land 145.844 Ha.) is mostly rain-fed agriculture Land.

#### **11.0 Description of Environment**

This section contains the description of baseline studies of the 10-km radius of the area surrounding the site. The data collected has been used to understand the existing environment scenario around the proposed mining project against which the potential impacts of the project can be assessed. Baseline data was generated for various environmental parameters including air, water (surface and ground water), soil, noise, meteorological, ecology and socio-economic status to determine quality of the prevailing environmental settings. The baseline data for study was conducted during summer (March to May, 2022) season.

#### **11.1 Meteorological Data**

The study area is part of tropical monsoon climate with long humid summer and short winters. The rainfall is heavy during monsoon and light in pre monsoon season. The annual average total rainfall recorded in the region was found to be 1526.9 mm. The maximum average rainfall (460.9 mm) was recorded in the month of July. This month also had the maximum number of rainy days. The average maximum temperature was recorded in the month of May at 39.5°C and the minimum temperature was 8.8°C in December. The highest temperature recorded in the area was 44.9°C in June 1988 while the minimum was 0.9°C in January 1989. The Relative Humidity was highest during the monsoon season with the month of August recording the highest average at 88%.

The maximum average wind speed was found to be 7.8 kmph in the month of June. The predominant wind direction recorded at the IMD station was from North followed by South-west and West.

#### **11.2 Air Environment**

Seven Ambient Air Quality Monitoring (AAQM) Stations were selected. Criteria used for designing the network were principally governed by the wind rose pattern for pre-monsoon seasons and the accessibility of the selected sites. The value of parameters at all the location is found within the limits prescribed by Central Pollution Control Board (CPCB).

- PM10: The highest (98th percentile) value i.e., 69.88 µg/m3 was observed for PM10 at Project site and minimum value of 52.26 µg/m3 for PM10 was observed at Lurena. The 24 hours applicable limit for industrial, Residential Rural and other Areas is 100 µg/m3.
- PM2.5: The highest (98th percentile) value for PM2.5 i.e., 32.7328µg/m3 was observed at and Kamleshwarpur minimum value 20.86 µg/m3 for PM2.5 was observed at Kesara. The 24 hours applicable limit for industrial, Residential Rural and other Areas is 60 µg/m3.
- SO2: The highest (98th percentile) value for SO2 of 24.114µg/m3 was observed at kesara village and minimum value for SO2 is 9.84µg/m3 which was observed at Sapnadar,. The 24 hours applicable limit for Industrial, Residential, Rural and other Areas is 80 µg/m3.
- NO2: The highest (98th percentile) value for i.e., 21.0892 was observed at Rupakhar site and minimum value for NO2 is 10.12 μg/m3 was observed at Kuma and at Kesara village. The 24 hours applicable limit for Industrial, Residential, Rural and other Areas is 80 μg/m3.

The data indicate that the results are within the standards specified in the NAAQS.

#### **11.3 Noise Environment**

The noise level in area varies from 51.0 dB (A) to 63.4 dB (A) during day time and 38.4 dB (A) to 42.6 dB (A) during night time. Traffic movement was found due to the vehicular movement & mining activities in nearby areas. In general, Noise level in study area was found well below to the standards.

#### **11.4 Water Environment**

#### **Drainage Pattern of Mine Lease Area**

No perennial nala is flowing within the lease area. The main drainage of the area is through different seasonal water courses originating from the plateau. Streams of the plateau exhibit a combination radial and dendritic pattern. A main nala Mangadra is about 3 km on the northern side of the area, flowing towards northern direction and meets to Gungata Nala. There is a gentle slope from northern direction to southern direction, no stream crosses the mine area. Drainage within the mine lease area, as it can be seen that the flow is towards south contributing to nala in the south.

#### Water Quality

One surface water and Seven ground water samples were collected and tested to know the water quality of study area. The samples collected were examined for relevant physical and chemical parameters. Analysis of the parameters like pH and alkalinity were carried out at the sampling stations immediately after collection of samples with the help of Field Analysis Kits. The metallic constituents like Fluorides, chromium, iron and Magnesium were analyzed with Atomic Absorption Spectroscope. The samples were collected and analyzed as per the procedures specified in 'Standard Methods for the Examination of Water and Waste Water' published by American Public Health Association (APHA). The results were compared with the guidelines given by Bureau of Indian Standards (BIS). The water quality of the surface water samples collected were analysed and found well within the desirable limits as per IS: 2296 Class C & IS: 10500:2012, and fit for drinking after conventional treatment and disinfection.

The colour and turbidity of the samples were normal. Total Dissolved Solid was 246.0 - 382.0 mg/l range which is within the maximum permissible limit of 1500 mg/l.

Chlorides, sulphates and fluoride concentration of the samples were well below the permissible limits. The magnesium concentrations was of the range 9.26 -13.15 mg/l. Biological contamination of surface water bodies were observed due to stagnant nature of water bodies. The heavy metals were found to be below detectable limits. In general, the water quality of the sampling location was found complying acceptable tolerance limits as per IS: 2296 Class C considering the concentrations of relevant parameters and can be used for drinking purpose after conventional treatment.

#### **11.5 Soil Quality**

To understand the soil quality in the proposed study area, 7 locations were selected for soil sampling. Composite sampling of soil up to root depth (30 cm) was carried out at each location. The important properties of soil are bulk density, porosity, infiltration rate, pH and organic

matter, kjeldahl nitrogen, phosphorous and potassium.

#### **11.6 Biological Environment**

#### Flora

The project site is an open scrub land devoid of thick vegetation. The common trees observed in the study area and in the reserved forests in the study area are Tendu, Bael, Amla, Khair, Aam, Sal, Champa, Teak, Pakri, Kekad, Mahuwa etc.

#### Fauna

The mine lease area is Agricultural land and the area is devoid of significant faunal existence. A primary field survey was conducted through random observation in the study area and data was also collected from local persons of the area and forest officials. The common mammals observed in the study area and in the reserved forests in the study area are jackal, squirrel, fruit bat, field rat, Bengal monkey, barking deer, jungle cat etc. The common birds observed in the study area are common myna, house crow, spotted dove, Jungle crow etc.

#### **12.0 Anticipated Environmental Impacts and Mitigation Measures**

#### 12.1 Impact on Ambient Air Quality

The mining is proposed to be carried out by opencast Semi-Mechanized method. The air borne particulate matter generated by ore and handling operations, transportation and screening of ore is the main air pollutant. The emissions of Sulphur dioxide (SO<sub>2</sub>), Oxides of Nitrogen (NOx) contributed by vehicles plying on haul roads are marginal. Prediction of impacts on air environment has been carried out taking into consideration proposed production and net increase in emissions. The maximum incremental ground level concentration of PM<sub>2.5</sub> will be 3.76 µg/m3 in the project site. This shows that the adverse impact of mining outside the ML area will be marginal and will not have any adverse effect on health of human and animals and also on the flora of the area. For PM<sub>10</sub> the incremental value is 13.0 µg/m<sup>3</sup> at mining pit and it is confined to only mine area hence there will be no major impact on the environment.

#### **Mitigation Measures for Air Pollution**

Bauxite is a hydrated oxide of aluminum. It is a mixture of two or more hydroxides corresponding to Gibsite (Al2O3.3H2O) and Boehmite (Al2O3.H2O). The moisture content in Bauxite is around 3% to 7%. Therefore, emissions due to mineral handling, during mining operations are not much and restricted to the lease area only. Air pollution is caused mainly due to dust generation added with gaseous emission from transportation activities along with mining operation like loading etc.

#### **Control of Fugitive Emission**

- Use of Personal Protection Equipment (PPE) like dust masks, ear plugs etc by the mine workers.
- Regular Water sprinkling on haul roads & loading points will be carried out.
- Development of green belt/plantation around the lease boundary, roads, dumps etc should be developed.

• Ambient Air Quality Monitoring conducted on regularly basis to assess the quality of ambient air.

#### **Preservation and Control of Gaseous Pollution**

In mining activities, the sources of gaseous emissions would be vehicle movements. Proper maintenance of machines improves combustion process & makes reduction in the pollution. Good maintenance and monitoring of fuel and oil will not allow significant addition in the gaseous emission.

#### 12.2 Impact on Noise Level

In mining, noise pollution is generally caused due to drilling, blasting, movement of vehicles and deploying of heavy Machinery i.e noise generated at the mine is due to truck transportation activities. The noises generated by the mining activity will dissipate within the mine. There may be noise pollution due to drilling, blasting . This may go beyond the threshold value i.e. 90dB (A), but will be momentary. No major impact of the mining activity on the nearby villages is envisaged. The pronounced effect of noise will be felt only near the active working area. The impact of noise on the villages is negligible as the villages are located far from the proposed mine lease area or mine workings. Since there in no involvement of major machinery, the impact of noise levels will be minimal.

#### **Mitigation Measures for Noise Pollution**

The mitigation measures for Noise Pollution are suggested as follows: The measures will be taken to maintain the noise level within limits. Periodical maintenance of equipment will be carried out. Noise due to blasting will be controlled by adopting time-delay blasting technique. Time of blasting will be restricted to daytime only. The blasting time and schedule will be well informed to the surrounding inhabitants. Ear plugs will be provided to the Operators.

#### **12.3 Mitigation Measures for Water Pollution**

The following mitigation measures are suggested for water management and water pollution control. However, priority relevance depends on the location and type of mining and minerals.

The area has no perennial nala in and around the lease area, there is a gentle slope from northern direction to southern direction, only run of water which can enter from northern direction in the lease area.

Hence there will be negligible impact on water regime due to mining operation. Since no water table is encountered during drilling of borehole (ABCK-40) up to 22 meters, hence water table is below 30 meters ground level and average mining activities will be carried out up to 10 meters below ground level.

Therefore, there will be no adverse effect in ground water regime. To eliminate the chances of pollution of nearby water regime through silt and rain wash of mine exposed area during rainy season, construction of a garland drain is proposed. Up to the life of the mine, there is negligible chance of working going beyond 17 m depth, hence there will not be an intersection with ground water.

Rain water will not be harvested in mine Pits as it is agricultural land which will be reclaimed after mining and will be handed over to farmers.

#### 12.4 Impact on Flora & Fauna

The proposed mine lease area is away from any type of sensitive area. Mine site preparation will involve removal of vegetation cover which may impact the biodiversity of the area. The impact on terrestrial ecology will be due to emission of gaseous pollutant like NO2 from vehicles. For the mining operations, NO2 emissions are mainly due to burning of diesel in mining vehicles. As described in the baseline on air quality, the low concentrations of NO2 due to operation of the mining operations will have insignificant impact on ambient air quality and NO2 concentration will remain much below the NAAQ standards. Therefore, the impact of these emissions on the surrounding Agro-ecosystem will be insignificant.

#### **12.5 Social Environment**

The mine area does not cover any habitation. Hence the mining activity does not involve any displacement of human settlement. No public buildings, places, monuments etc exist within the lease area or in the vicinity. The mining operation will not disturb/ relocate any village or need resettlement. Thus no adverse impact is anticipated. The impact of mining activity in the area is positive on the socio-economic environment of the region. The negative impact will be limited to some sporadic health problems, which may occur due to increase in fugitive emission in the vicinity of the mines. The proposed mine project is providing employment to local population and it will be give preference to the local people whenever there is requirement of man power. The local skilled labour will have additional opportunity to enter into automobile maintenance profession to cater to the needs of the transport trucks.

#### **13.0 Analysis of Alternatives**

In the proposed project, opencast Semi-Mechanized mining method will be carried out. Hence, no new methodology is explored. So, all the parameters of EMP will be implemented as per the open cast Semi-Mechanized mining.

#### 14.0 Budgetary Provision for Environment Protection

Sufficient fund allocation will be made towards environmental management and monitoring program. In order to implement the environmental monitoring, timely funds will be released as per requirement. Per annum capital cost is 6.0 lakh per and recurring cost is 8.0 lakh.

#### **15.0 Conclusion**

The proposed facilities are not likely to cause any significant impact to the environment and ecology of the area, as adequate preventive measures will be adopted to keep the various pollutants within the permissible limits. Green belt development around the area will also be taken up as an effective pollution mitigation technique, as well as to serve as biological indicators for the pollutants released from the premises of Kamleshwarpur Mining Project.