

## **EXECUTIVE SUMMARY**

### **INTRODUCTION**

Chachandeeh Bauxite mine is situated in village Chachandeeh, Tehsil- Pushparajgarh, District Anuppur of Madhya Pradesh State. The mining lease period is w.e.f 06.05.2004 to 05.05.2024. The mining plan was earlier approved under rule 22 of MCR 1960 vide letter no. MP/SDL/MPLN/G-02/2003-04 dated 13.05.2003. The mining plan was later modified under rule 10 of MCDR 1988 and approved vide letter no. MP/Anuppur/Bxt./MPLN/Mod-7/04-05 dated 10.05.2005 for targeted production of 50,000 tonnes of bauxite per annum. The lessee has obtained a assurance from M/s Hindalco Ind. Ltd to purchase 1,00,000 M.T per annum of metal grade bauxite produced from the mine. The mine was first opened on 4.9.2006 and as such the 5 year of mining plan period is upto 3.9.2011. One year of mining plan period has passed and hence this modified mining plan has been prepared for 4 years of balance period.

### **Location**

The mine lease area is located within the jurisdiction of Chachandeeh village, Tehsil- Pushparajgarh, District Anuppur (M.P). Geographically the ML area falls under following co-ordinates:

Latitude	:	N 22 <sup>0</sup> 50' 19" to 22 <sup>0</sup> 50' 34"
Longitude	:	E 81 <sup>0</sup> 36' 41" to 81 <sup>0</sup> 37' 03"

## **PROJECT DESCRIPTION**

### **Topography & Drainage**

The topography of the lease area is peneplane. It is mostly situated on the top of the Garhi Dadar hillock in the form of plateau with slope at places. The highest elevation is about 1096 m AMSL in mid of the plateau and the lowest elevation is about 1092 m AMSL in north and south directions. The general slope of the area is towards west direction.

### **Salient Features of Mining**

- Mining is proposed by manual method.
- Estimated Mineable Reserves: 12.05 lakh tonnes.
- Maximum rate of production will be around 1.0 lakh tonnes per annum.
- Anticipated life of mine is 14 years.

- Drilling has been proposed to be done in the area with jack hammer or by hand hole.
- Blasting will be done with gun powder and safety fuse.
- Tippers will be used for loading and dumping of waste material and ore.
- Quantum of waste is expected to be around 30870 m<sup>3</sup> per year
- At present total man power is around 145.

## DESCRIPTION OF THE ENVIRONMENT

Meteorology (Pre Monsoon 2008)

Sl. No.	Parameters	Data
1	Maximum temperature (°C)	43.2
2	Minimum temperature (°C)	16.0
3	Maximum Relative Humidity (%)	91.0
4	Minimum Relative Humidity (%)	3.0
5	Total Rainfall (mm)	Nil
6	Predominant wind direction	From South West

### Ambient Air Quality

The ambient air quality with respect to the study zone of 10 km radius around the mine site forms the baseline information. The various sources of air pollution in the region are dust rising from unpaved roads, domestic fuel burning and vehicular traffic.

Pre-calibrated R.D. Samplers have been used for monitoring the existing AAQ status.

The summary of Ambient Air Quality test results are given below.

Name of sampling location	SPM	RPM	SO <sub>2</sub>	NO <sub>X</sub>
Mine Lease Area	180.6	58.5	11.0	15.2
Chachandeeh	183.6	58.8	10.8	16.6
Garhidadar	189.6	113.8	18.8	21.3
Piparna	187.6	112.6	18.6	21.1
Mohadi	167.6	100.6	16.2	22.1
Solhara	170.6	58.9	10.0	14.5
Khati	165.5	61.8	10.5	15.0
*NAAQ Standard for industrial area Annual Average / 24 Hrs	360/500	120/150	80/120	80/120
**NAAQ Standard for residential area Annual Average / 24 Hrs	140/200	60/100	60/80	60/80

### Noise Level

A preliminary survey was undertaken at 7 locations i.e. 1 location in mine lease area and 6 locations in buffer zone during study period, to identify the major noise generating sources in the area. Summary of noise level data of different locations are given below.

**Noise Levels during Study Period [Units:dB(A)]**

	<b>N-1</b>	<b>N-2</b>	<b>N-3</b>	<b>N-4</b>	<b>N-5</b>	<b>N-6</b>	<b>N-7</b>
L <sub>min</sub>	38	37.7	36.8	37.9	37.4	36.9	36.3
L <sub>Max</sub>	60.3	60.8	56.6	57.1	56.8	56.8	56.3
L <sub>d</sub>	54.4	54.7	52.5	53.2	52.8	52.6	52.6
Standard	75	75	55	55	55	55	55
L <sub>n</sub>	39.5	39.7	38.3	39.5	39.7	39.7	40.0
Standard	70	70	45	45	45	45	45
L <sub>min</sub>	Minimum Noise Level Recorded						
L <sub>Max</sub>	Maximum Noise Level Recorded						
L <sub>d</sub>	Day Equivalents						
L <sub>n</sub>	Night Equivalents						
L <sub>dn</sub>	Day-Night Equivalents						

The major noise generating sources are mining related activities, commercial activities, traffic and blasting. The ambient noise level in and around the existing mine area is well within the statutory limits.

**Traffic Density**

The characteristics and volume of traffic in the buffer zone was studied during the monitoring period, on Chachandeeh – Garhidadar road. Summary of the traffic study is given below.

Type of Vehicle	Total traffic on Chachandeeh – Garhidadar road (in 24 hrs)
HMV	76
LMV	38
2 & 3 Wheelers	120
Total	234

Perusal of the above monitored data shows that the traffic density on Chachandeeh – Garhidadar road in a working day is 234.

**Water Environment**

**Surface Water**

There is no river, nalla or any surface water source within ML area. Johilla river is at the distance of 8 km from the ML area. Pandripani nala is at a distance of 2.0 km from the ML area. The existing seasonal nallahs of the study area only help to drain out rain water during monsoons.

### **Ground Water**

The study area essentially comprises of weathered Bauxite at shallow depth and hard Bauxite comparatively at lower depth. In the study area ground water is available both under confined and un-confined conditions. The water table is about 15m-18m below the ground level 1070 m R.L i.e. it varies from 1055 m to 1052 m RL. The water table goes down 18 m (1052 m RL) during dry season and rises upto 15 m (1055 m RL) during rainy season.

### **Water Quality**

Three ground water samples were collected and tested to know the water quality of the study area. Summary of the water quality results are given below.

<b>S.No</b>	<b>Parameter</b>	<b>Ground Water</b>	<b>Desirable limits as per IS:10500</b>
1.	pH	7.1-7.9	6.5 – 8.5
2.	Total Dissolved Solids	205-225	500
3.	Total Hardness as CaCO <sub>3</sub>	215-257	300
4.	Chloride as Cl	14-23	250
5.	Flouride as F	0.2-0.55	1.0
6.	Turbidity	2-10	5

Persual of the above table shows that physico-chemical characteristic of the samples analyzed were well within the desirable limits of the prescribed drinking water standards IS: 10500.

### **Land Environment**

#### **Land Use**

The entire lease area 17.744 ha. It is a government waste land. It is a working mine. Land use of mining lease area and study area are given below.

**Present Land use of ML area**

S.No.	Category	Land Use (In Ha.)
1	Excavation	1.00
2	Over burden dumps	0.20
3	Storage for top soil	0.20
4	Roads	0.35
5	Green belt / Plantation	0.10
6	Site services	0.002
7	Others	0.02
8	Undisturbed area	15.872
Total		17.744

**Land use in the Study area**

Land use	Area (in ha)	Percentage (%)
Forest land	5100	16.24
Irrigated land	103	0.33
Un irrigated land	18018	57.38
Culturable waste land	3056	9.73
Area N/A for cultivation	5123	16.32
<i>Total</i>	<i>31400</i>	<i>100</i>

**Soil Environment**

**Soil Quality**

Soil samples were collected from three locations from the core and buffer zone to evaluate the soil quality in the study area. All the samples are showing moderately fertile nature.

The sampling locations have been finalized with the following objectives:-

- To determine the baseline soil characteristics of the study area.
- To determine the impact of industrialization on soil characteristics.

**Biological Environment**

**Flora**

The area has mixed forest, mostly spread over the Kaimur plateau. Teak and Bamboo can be seen in this plateau. The observed flora of the study area is typically Dry Deciduous type. Saja, Dhao, Salai, Tendu and Khair are the common trees present in the study area.

## **Fauna**

Faunal population did not show any special feature. Concentration of animals is sparse. Avi-faunal population was also not rich in the forest areas. There is no Schedule I animal in the ML area. However Python, Monkey and Langur are the schedule I species as per Wild Life Protection Act 1972 present within the study area. Other predominant wild life mammals of the study area include wild goat, rabbit, jackal, fox, etc.

## **ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES**

### **Impact on Ambient Air Quality**

From the proposed mining activity removal, handling, transportation of ore and storage of wastes will cause an additional increase in the concentration of SPM in the atmosphere. Marginal emissions of Sulphur dioxide (SO<sub>2</sub>) and oxides of Nitrogen (NO<sub>x</sub>) can be anticipated by diesel operated equipments and vehicles plying on haul roads. Based on ISC-AERMOD model the maximum predicted concentrations of SPM during pick operation of mining will be 190.04 µg/m<sup>3</sup> within ML area and <191.5 µg/m<sup>3</sup> within study area.

### **Control Measures of Air Pollution**

<b>S.No.</b>	<b>Dust Source</b>	<b>Control measure</b>
1	Haul Road	-Compaction, gradation and drainage on both sides. -Proper maintenance. -Regular water spraying.
2	Truck Movement	-No overloading of trucks. -Trucks to be covered with tarpaulin while transporting ore. -Enforcing speed limit.
4	Mine pit	-Regular water sprinkling in working areas.
5.	Plantation	-Native species of the area proposed for the plantation. -Fast growing tree species are proposed for plantation on dumps and road sides.

### **Impact on Noise Level**

Increase in vehicles for transportation and haulage due to increase in production will add some noise level in the present monitoring level of noise specially within the active working area. The anticipated noise level at ML boundary from nearest pit boundary will be less than 50 dB(A), which is less than the prescribed limits for industrial area. No additional noise can be anticipated due to proposed mining activities at nearest habitat (about 500m from ML boundary) of Chachandeeh village.

### **Control Measure of Noise Pollution**

Noise levels will be kept within acceptable limits by:

- Limiting of speed of haulage vehicles/tippers
- Restriction of blast hole drilling to only day time hours and usage of sharp drilling bits and delivery of compressed air at optimal pressure during drilling
- Controlled blasting techniques with sequential blasting to reduce noise level and blast induced ground vibrations.
- Use of low density explosives to have a heaving effect than an explosion
- Provision of earmuffs/ear plugs to workers in noise prone zones in the mine.

### **Impact on Water Environment**

- Total water requirement is 17m<sup>3</sup>/day
- There is no waste water generation from the mine, hence contamination of surface and ground water quality is not possible.

### **Water Conservation Measure**

To conserve the water following measures are adopted:

- After life of mine the excavated pit will be available for rain water infiltration
- Water sprinkler will be used for dust suppression
- Dry washing of mine machinery will reduce the water consumption

### **Impact on Land**

The present land use of the core-zone i.e. mining lease area is mostly broken waste land. There is no agriculture or forest cover. Afforestation has been done near the mine office outside pit limit. Hence every impact on land use will be positive in future by way of afforestation or water reservoir. Backfilling will be done in exhausted portion of the quarry.

In buffer zone no adverse impact is envisaged due to all mining activities being restricted to the core zone only. The intensity of mining is less, most of the area already broken, backfilling proposed & garland drain & bund prepared towards the sloping southern side denies any adverse impact in the buffer zone if any.

### **Impact on Flora & Fauna**

The area is thinly vegetated and with no thick vegetation on the plateau top. There is no tree growth on the top of the plateau area, but grass shrub and bushes grow sparsely. No wildlife is found in this area. The mining activity of the proposed project does not change the community structure of the vegetation.

### **Impact on Socio-Economy**

Since there is no village or human settlement within the core zone, therefore there would be no displacement of the human population.

The mining operations will substantially increase gross economic production and infrastructure facilities. Therefore, Socio economic prospects are likely to improve to some extent. Also increase in mining operations will result in some increase in direct and indirect employment and consequently the population in near by villages.

## **ENVIRONMENTAL MANAGEMENT PLAN**

### **Air Quality Management**

- Drilling & blasting operations which generate maximum quantity of dust are intermittently operated and are restricted to only hard rock portions exposed.
- Water tankers with spraying arrangement will be used for regular water sprinkling on the haul roads to ensure effective dust suppression.
- Dust masks will be provided to the workers especially for the drillers and for the workers working in the loading operations.

### **Waste Management**

Generation of waste will be around 30870 m<sup>3</sup> per annum. There is no generation of sub-grade ore.

The Overburden will be removed in two sages. The soil at the top will be removed first and transported by 10 T tippers for Stacking and later this soil stack shall be reused for spreading over the back filled portions with the overburden and mine wastes.

No external dumping will be done in future. Simultaneously backfilling will be done in the excavated area which will be treated as internal dump only. The sides have been sloped to 28<sup>0</sup> and inactive sides have been vegetated.

### **Afforestation**

The mined out areas will be backfilled and reclaimed with dense poly-culture plantation of the local species. Water reservoirs will be created in the abandoned mine pit that shall increase the water availability on the plateau for longer periods of time. During the plan period an area of 0.3 ha land has been proposed for phased green belt plantation/afforestation and till the post mining stage a total area of 16.326 ha land shall be afforested. The species to be grown in the areas should be dust tolerant, fast growing and fruit yielding species so that a permanent green belt is created.

### **Socio-Economic Benefits**

The lessee provides social welfare activities in and around the lease area. The social welfare activities are planned in the following areas:-

- Medical assistance
- Primary Education
- Agriculture improvement
- Vocational Training and
- Assistance in utilizing government programs

### **ENVIRONMENTAL MONITORING PROGRAMME**

Routine monitoring of all the environmental parameters viz. air, water, noise and soil as per the formulated program based on CPCB and MOEF guidelines every year in order to detect any changes from the baseline status. Monitoring program will be followed till the mining operations continue. For implementation of Environment Management Plan a

small unit called Environment Management Division will be formed under the control of the Mines Manager. The job of this division will be regular environmental monitoring, preparation and submission of environmental report, green belt development, etc.

### **CONCLUSION**

Based on the EIA study it is observed that there will be an increase in the dust pollution, which will be controlled by sprinkling of water and transportation of ore in closed trucks. There will be an insignificant impact on ambient environment and ecology due to the mining activities moreover the mining operation will lead to direct and indirect employment generation in the area. Monitoring program will be followed till the mining operations continue. Around Rs.0.45 crores and Rs 325 per tonne as capital and recurring budget for environmental protection have been formulated to achieve the environmental quality as desired. Hence, it can be summarized that the development of the mine will have a positive impact on the socio-economic of the area and lead to sustainable development of the region.