SUMMARY

OF

RAPID ENVIRONMENT IMPACT

ASSESSMENT

OF

MAHAVIR MINERALS

66, MALVIYA NAGAR,
DURG

FOR PROPOSED

BAUXITE ORE MINING

AT VILLAGE – DALDALI, DIST- KABIRDHAM

SUMMARY

OF

RAPID ENVIRONMENT IMPACT ASSESSMENT

SUMMARY

1. PREAMBLE

M/s Mahavir Mineral is proprietary concern owned by Shri Kanti Parakh. The concern is proposed to have mining activity of bauxite at Village Daldali, District Kawardha in the state of Chhatisgarh. The mining lease period is from 30.12.2002 to 29.12.2032.

The project envisages forward mining activity for Bauxite ore at mine area of 38.211 hectare at Village Daldali at district Kawardha, Chhatisgarh for the anticipated production of ore by 4,50,000 tonnes per annum..

In order to assess the likely impacts on environment due to ongoing mining activity and to have a tool of environment management, M/s Mahaveer Minerals entrusted the task of Rapid Environment Impact Assessment study for mining project to M/s Creative Enviro Services, Bhopal.

2. LOCATION

The mining area is located in village Daldali at district Kawardha, Chhattisgarh located on toposheet no. 64 F/3 (Scale 1:50,000) by the following coordinates :

Latitude	$22^0$23'40'' N
Longitude	$81^0$11'40''E

3. TRANSPORT

The proposed area can be approached from Durg to district Head quarter kawardha by state highway and distance is 125 km and from Kawardha to Borla by tar road which is 20 km away only. There is diversion for proposed site from Borla to Daldali via Taregaon, which is 40 km and connected by WBM and fair weather road. The proposed area is south of Daldali Village.

The nearest railhead is located at Bilaspur on SE railway, which is 140 km away from the site.

4. REASON FOR ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

The impact of mine on the environment depends to a large extent on its location with respect to Human settlements, meteorological conditions, ambient air quality, water bodies, agricultural and forest land etc.

Most of the adverse impacts of mines are amenable to technological control by providing necessary preventive and control measures and finally through effective environmental management of the operating mines. Keeping in view the likely impacts of mines on environment, this Rapid environment impact assessment report has been prepared for submission to State Pollution Control Board and Ministry for Environment and Forests (MoEF) for clearance of the proposed additional mining area.

5. PROJECT DESCRIPTION

5.1 Geology

A sequence of Deccan lava flows capped by laterite constitutes the geological formation in the area. The laterite capping contains bauxite zones with lithomargic clays at the base of the laterite profile. The deccan lava flows, which are almost horizontal, are generally massive. Development of Bauxite is conspicuous in these plateau and outcrops are visible in the area.

The Bodai- Daldali Bauxite bearing laterite capping is found on the top of the basaltic plateau (Deccan Basalt) at an elevation of 915 M above MSL. The residium has attained a total thickness of about 24.60m in the Daldali block and comprises several recognisable lithological units. A typical profile as recorded in one borehole drilled down to the basement rock is enumerated in the following table.

Lithology	Thickness(m)	Description
Soil	2.00	Dirt gray grading downwards into lateritic soil
Upper Laterite	1.00	Pisolitic, loose or indurated, scoriaceous contains pebbles and

		boulders of the bauxite and shows undulatory but sharp contact with underlying Bauxite.
Bauxite	3.5 – 4.5	Massive sometime pisolitic hard and compact, denser than the laterite vesicular and pitted, displays shades of light gery and pink colours.
Lower Laterite	3.30	Massive, locally oolitic and pisolitic moderately hard to soft, vermicular and scoriaceous, porous and shows darker shades of red, yellow and brown colour.
Lithomarge	15.30	Light grey, yellow & red clay, laminated laminae impersistant and highly porous.
Trap	0.50	Weathered at the contact with the lithomarge followed downwards by fresh unaltered trap

It is estimated that high grade Bauxite in the Daldali block is confirmed to the northern and eastern (central) parts bearing no relationship to the present topography. However there is slight but noticeable reduction in value of Silica near the margins than the central parts of the plateau. Titanium Oxide is relatively high in the Bauxite confirming to the known high content in the similarly occurring Bauxite over the Daccan trap.

The normal stratigraphical sequence in the area is as follows :

1. Alluvium, Sand dunes etc : Sub Recent to Recent
2. Laterite with Bauxite horizon : Pleistocene
3. Deccan Trap : Lower Eocene

The deposit area constitutes the central part of the extensive laterite capped plateau of the Maikala range hills. In the plains on the north-western part around Kathaitola, gneissose and schistose rocks form the core of the range, whereas in the south-east, around Taregaon, phyllites slates and quartzites

belonging to the Chilpi ground are exposed. In the lower part of the plateau, narrow patches of lametas, represented by calcareous gritty sand stones and pink and white clays are seen in the Kanai nadi section at Kurki. These are overlain by horizontally disposed basaltic lava flows of Deccan Trap affinity which are massive and vesicular to amygaloidal at places. Good exposures of Deccan Traps are noticed along the Kukrapani – Daldali ghat section. The basaltic traps were subjected to weathering with the formation of laterite at the top. The traps are capped by about 25 m thick laterite. Bauxite is found normally within upper part of laterite cappings.

5.2 Local Geology & Ore Geology

Bauxite the residual products of intensive weathering of basalt rock under extreme oxidising condition in tropical climate characterised by strongly contrasted wet and dry season. The condition for the formation of bauxite are unique, the process is that of lateritisation and bauxitisation. There is no sharp dividing line between laterite and bauxite, one may merge into other.

Bauxite a hydrated oxide of aluminium is formed as a result of tropical weathering of trap rock. It is a mixture of two or more hydroxides corresponding to Gibbsite and Boomita. The bauxite deposit occurs both as insitu deposit on the plateau top and in the form of float concentration on the slope.

The autochthenous Bauxite of the Bodai Daldali area forms discontinuous thin and flat lenticular bodies within the laterite , the ore being generally restricted to upper one and third portion of the laterite cover. It forms impressive outcrops along the exist of plateau. Due to difference in hardness of the laterite and bauxite, the differential erosion has removed the overlaying soft laterite from the underlying hard and massive bauxite rendering the latter to crop out as distinctive pavements as prominent escarpments. The basement fractures traversing the residuum has formed wide openings in the ore zone, which are filled with soft and loose laterite. The latter may also be recemented and as hard as the lower laterite and contains small fragments, reworked pebbles to small boulders of Bauxite. Depending upon the frequency and magnitude of the opening the volume of the impurities in the ore zone may be at time 50 % or even more. The Bauxite zone thickness and thins out showing great irregularties in its upper and lower extents. It is now commonly believed that the residuum

represents the remanants of old peneplains in which the extent and thickness of Bauxite lenses is governed by the then prevalent drainage. The thick portion of the bauxite lenses corresponds to the passage of the drainage channel while thin one to refer their flanks and slopes. Within the Bauxite there may occur wide areas of the non bauxite materials i.e. laterite which literally merge with Bauxite lenses and represent the former areas devoid of the good drainage. The screen material containing which chunks of Bauxite and laterite, which occurs even along the slopes far below of the residuum on all sides of the Bodai Daldali plateau suggest extensive scrap retreat and hence continuous destruction of the residuum. The quality of the bauxite can be judged from its colour, texture and specific gravity. High alumina content is indicated by light shades of colour lack of cavities and greater density. The ferruginous bauxite have different shades of the pink colour and the dark coloured patches contain more iron due to which its specific gravity is also normally high. The clayey bauxite is characterised by high porosity and in turn low specific gravity.

1.	Soil	Red or yellowish, thin mentle, mostly absent
2.	Laterite	With reddish yellow, porous semi compact bauxite boulders with low grade Bauxite boulders
3.	Aluminium Laterite	Red and white strips, patchy, hard and compact
4.	Bauxite	Massive compact to semi compact, soft, white purplish, greyish, cement colour, pisolitic at places
5.	Clayey Bauxite	Soft, earthy, white and pinkish white plastic
6.	Lithomargic	Grey, Yellowish, purplish, soft, plastic clay impervious, silicious and rarely laminated
7.	Basalt	Hard, compact, greenish gray in colour, vesicular at places.

The above generalised profile is not visible in any single pit section or boreholes. Bauxite also occurs in the form of float ore at the base of the scrap section and on the slopes of the plateau.

5.3 RESERVES

Proved category

Total Area in proved category	:	2,12,400 M^2
Thickness of bauxite deposit	:	2.0 m
Volume of bauxite deposit	:	212400 X 2 = 424800 M^3
Reserve of bauxite Deposit	:	424800 X 2= 849600 tonnes
Probable category		
Total Area in probable category	:	1,15,100 M^2
Thickness of bauxite deposit	:	2.0 m
Volume of bauxite deposit	:	115100 X 2 = 230200 M^3
Reserve of bauxite Deposit	:	230200X 2= 460400 tonnes

It may be calculated that estimated geological reserve is about 13,10,000 tonnes in the mines.

5.4 Anticipated Life of the Mine

Anticipated life of the mine will be obtained by computing the life of the mine by considering the proposed rate of production when the mine is fully developed and production for next years. The mining operation in the area is in progress which is likely to be increased by 400000 to 450000 tonnes per annum, depending on the market demand. Considering the above factors anticipated life of the mine would be around 8 years for extracting proved category reserves as per the present information available.

5.5 Mining Method

It has been observed that the thickness of overburden is small. The deposit is of mound nature and top of the deposit is in the form of plateau and can be opened up easily by removing overburden. It is proposed to undertake manual/semi mechanised opencast mining, which has been discussed below;

The overburden is less, which is 1.5 m in the proposed area, and the proposed method of mining will be of manual / semi mechanised opencast mining. It is

proposed to open a working pit by removing overburden in the southeastern side of the proposed area. In this area bauxite has already been proved for 2.0 thickness. Initially the overburden will be removed from proposed pit, which is almost flat. The thickness of overburden in the proposed pit is around 1.5m, so height of the top bench will be 1.5m. The overburden bench will be ahead of the bauxite bench so that intermixing of overburden and Bauxite is avoided. This development will be completed in first year itself and the bauxite bed will be exposed. In the subsequent years of operation i.e. 2nd year onwards the top bench advance in northern direction gradually increasing the dimension of the working pit. The height of the top bench will be 1.5m and the working will progress in northern direction.

The second bench will be developed in Bauxite bed and development of second bench and production of Bauxite will commence in 1st year itself. As it has been indicated that a working pit will be developed in 1st year by removing overburden. The height of the bench will be 2.0 m. The working pit will be widened in northern direction. The spread of the pit will gradually increases as the advancement of the working pit is being carried out yearwise. These two benches working will continue till the end of the lease period.

Year	**Overburden Bench**		**Bauxite Bench**	
	No.	Height	No.	Height
1st	1	1.5m	1	2.0m
2nd	1	1.5m	1	2.0m
3rd	1	1.5m	1	2.0m
4th	1	1.5m	1	2.0m
5th	1	1.5m	1	2.0m

The complete mining operation will be done manually only. Drilling will be carried out by compressed air operated jackhammer and blasting by special gelatine, detonators and safety fuse. Mining will be utilized for maintenance of mining road.

5.6 Proposed Rate of Production

It will be about 450000 tonnes per year of saleable ore for full year after complete development of the mines.

5.7 Loading

Loading of ore will be done manually to the trolley/trucks and will be sending to the end users. The overburden will be removed and stacked in a place in the surface. Subsequently it will be manually loaded to the tipper for onward dumping to the predetermined space in the lease boundary.

5.8 Hauling/Transport

The ore will be transported to the sorting yards by means of tubs on tracks.

5.9 Mining Machinery and Equipment

As explained, manual open cast method is proposed for the bauxite mining, No major equipment is required for the purposes. The following mining machineries and equipment is available with the lessee for the development of mining

1.	Air Compressor of 250 cfm capacity	02 no
2.	Compressed air operated Jack hammer drill	04 no.
3.	Portable magazine of 500 kg capacity	01 no
4.	Exploder 100 shots	02 no
5.	Tippers of 10 tonnes capacity	10 no
6	Excavator cum loader	02 no

5.10 Broad Blasting Parameters

The mining operation will be in small scale and average production will be in the range of 4,00,000 to 4,50,000 tonnes per year. The future production will also be in the same range.

Burden	:	0.9 m
Spacing	:	1.00 m
Depth of drill hole	:	2.0 m
Diameter of blast hole	:	32-34 mm
Charge per Hole	:	500 gm – 600 gm of special gelatine alongwith detonator & adequate length of safety fuse.
Power Factor	:	10-12 t per kg of explosive
Quantity of explosive per hole	:	20 kg per round for 40 no, 20-30m of safety fuse.

Depth of drill hole is proposed 2.0 m and height of bench is proposed 1.5m. Blasting will be done by a qualified blaster having blasters certificate. Proper blasting and wet drilling will be done to control flying rock particles to avoid effect of blasting on nearby agricultural fields. Monthly consumption will be around 300 kg to 750 kg of special gelatine 100 m-150 m of safety fuse and 2000 nos to 5000 nos. of detonators.

5.11 Mine Drainage

The proposed area is in mound shape and top of the deposit is in the form of plateau. The surroundings is slightly undulating and having sloppy terrain. since the deposit is in the form of the plateau, which is elevated from the surrounding by 20 m. and the ground water table is almost 25 m to 30 m in the area, no seepage of water is envisaged from the proposed activity as no surface water sources are also observed in the lease area. The accumulated water in the developed pit during the rainy season will be used for green belt development.

5.12 Year wise Development for the next Five Years Period

Year wise proposed production of Bauxite for the next five year is given below:

Year	**Production of Bauxite Ore(in MT)**
1st Year (2005-06)	100,000 T
2nd Year (2006-07)	150,000 T
3rd Year (2007-08)	200,000 T
4 Year (2008-09)	300,000 T
5 Year (2009-10)	450,000 T

It has already been indicated that the total production will depend on the requirement of the market. The development of deposit is being designed in such fashion so that it will be capable of producing 450000 tonnes per annum when it is fully developed within five years after grant of mining lease but production will be regulated as per requirement of market.

5.13 Solid Waste Management

The waste dump management system has been adopted as per mining plan approved by Indian Bureau of Mines, Nagpur. The bauxite is covered with overburden and the thickness of the overburden is around 1.5 m to 1.6 m in the area. Apart from the above, 10 % of the Bauxite will be undersized and fines.

Dumping site for the overburden will be in the barrier zone of the lease boundary. The dumping site will be located in south eastern and southern side of the lease boundary in first five years of mining operation. The sub grade mineral during mining operation will be generated will be stacked in the non mineralized zone so that it can be used in future when proper technology develop and demand for the ore is created.

The slope, spread and height of the dumps will not be more than 45^{o}, 7.5m and 2.5m respectively. The space required for dumping of 25000 m^3 of overburden and with these parameters of waste dump is 12920 m^2 along the lease boundary. The yearwise dumping patterns are as follows :

Year	Quantity of waste	Space required	Location
Ist	7416 m3	2158 m2	South eastern side of lease area
IInd	5140 m3	1446 m2	South eastern side of lease area
IIIrd	19870 m3	4430 m2	South side of lease area
IVth	18720 m3	7620 m2	South side of lease area
Vth	54430 m3	12920 m2	South side of lease area

5.14 Resource Requirement

The present proposal is to carry out mining for Bauxite at Village Daldali, Tehsil Borla, Dist Kabirdham, (CG) For efficient operation of the Mines all necessary utilities will be made available, a brief description of the same is given below.

5.15 Storage facility

It is proposed to provide adequate storage facilities for the excavated mineral, explosives and waste dumps, which is generated/used during mining process. Proposed excavated minerals and waste dumps will be kept in the existing mining lease area.

5.15 Project Cost

Details of expenditure of the Mining project

Project	Estimated Cost in Lac of Rupees
Mining of Bauxite	**Rs. 47.00 Lacs**

5.16 Electric System

The power requirement for the project has been met by Chhattisgarh State Electricity Board , which is available at village Daldali.

5.17 Water Supply

The ground water table is almost 25 m to 30 m in the area, no seepage of water is envisaged from the proposed activity as no surface water sources are also observed in the lease area. Water is required for mining operation/establishment mainly for suppression of dust. The details of water balance of existing /proposed mining project are given below:

TABLE-2.1

WATER BALANCE OF MINING PROJECT

Process	**Quantity Required (in litres.)**	**Total**
a) Mine Site		
Mining Operation & Dust suppression & Green Belt	1000.00	1000.00
b) Domestic		
Drinking & Washing	600.00	600.00
Total (A + B)	**1600.00**	**1600.00**
Process	**Quantity Generated**	**Total**

	(in litres.)	
c) Mine Site		
Mining Operation & Dust suppression & Green Belt	Nil	Nil
d) Domestic		
Drinking & Washing	300.00	300.00
Total (C + D)	**300.00**	**300.00**

5.18 Transport

The proposed area can be approached from Durg to district Head quarter Kabirdham by state highway and distance is 125 km and from Kabirdham to Borla by tar road which is 20 km away only. There is diversion for proposed site from Borla to Daldali via Taregaon, which is 40 km and connected by WBM and fair weather road. The proposed area is south of Daldali Village.

The nearest railhead is located at Bilaspur on SE railway, which is 140 km away from the site.

6. EXISTING ENVIRONMENT SCENARIO

6.1 CLIMATE

The climate of the region is characteristically dry except in the monsoon season. All the three seasons are distinct. The summer season extends from February to June, till the onset of Monsoon. Rains are received from mid June to Mid September and winter season extends from October to January. The area receives an average annual rainfall of 600-800 mm. The maximum rainfall is received through south-west monsoon during June to August.

Temperature

Temperature records on study brings out the following observations :

- Lowest temperature $8^{o}C$
- Highest temperature $39^{o}C$

Month January is the coolest month of the study area while month May is the hottest month.

Rainfall

The rainfall in the study area can be termed as moderate the southern and south eastern parts of the district receives more rainfall as compared to the rest of the district. As much as 95% of the annual rainfall received in the district can be attributed to the south-west monsoon. The month of August receives maximum rainfall than other months.

Relative Humidity (RH)

The humidity levels are exceedingly high during monsoon months otherwise the air is generally dry over the entire district. The maximum humidity during study period in the study area was found to be as high as 28%, the minimum humidity was found to be 12%.

Wind Speed and Direction

During the study period the predominant wind direction was from N and SE direction in the morning and in evening time. The maximum wind speed is 8 Km/h. The data is based on Regional Meteorological Department, Nagpur for wind speed and wind direction.

6.2 AIR QUALITY

To establish the ambient air quality, sampling and testing were conducted. Air sampling stations were established at six (6) locations around the proposed mining area to assess the background air pollution levels.

COMPARISON OF AIR SAMPLING RESULTS WITH CPCB NORMS

	A1	A2	A3	A4	A5	A6	A7	CPCB Norms	
								Indl. & Mixed used area	lential & Rural Area
Postmonsoon Season (Sep2005-Nov 2005)									
SPM Concentration									
Minimum	**104.0**	**98.0**	**87.0**	**89.0**	**83.0**	**86.0**	**82.0**		

Maximum	**128.0**	**120.0**	**112.0**	**119.0**	**110.0**	**109.0**	**117.0**	500	200
Average	**115.2**	**109.1**	**99.1**	**102.2**	**98.2**	**99.8**	**98.8**		
RPM Concentration									
Minimum	**24.4**	**21.4**	**20.4**	**20.0**	**21.4**	**21.2**	**17.2**	150	100
Maximum	**44.7**	**43.5**	**41.0**	**41.4**	**39.8**	**38.5**	**37.1**		
Average	**34.3**	**33.0**	**30.0**	**30.8**	**29.8**	**30.1**	**29.9**		
SO2 Concentration									
Minimum	**5.6**	**4.9**	**4.5**	**4.8**	**4.1**	**4.4**	**4.4**	120	80
Maximum	**7.7**	**7.3**	**6.9**	**7.0**	**6.8**	**6.7**	**6.6**		
Average	**6.5**	**6.1**	**5.5**	**5.7**	**5.6**	**5.5**	**5.5**		
NOX Concentration									
Minimum	**8.2**	**7.1**	**6.2**	**6.6**	**6.1**	**6.6**	**5.3**	120	80
Maximum	**14.9**	**16.7**	**9.5**	**9.6**	**9.7**	**9.0**	**9.2**		
Average	**9.7**	**9.5**	**7.7**	**8.0**	**7.7**	**7.7**	**7.6**		

6.3 NOISE LEVEL

Ambient noise levels were measured at different locations (same as ambient air monitoring locations for two days on hourly basis) to establish present scenario which shall be described as follows.

- All the values are well within the norms prescribed by CPCB for industrial and commercial area.
- Main source of noise are traffic movements.

6.4 WATER QUALITY

In the study area, handpumps and borewells are the common source for water. Water samples were collected from Seven (7) water sources in the study area and tested for drinking water quality.

Sample code	pH	Alkalinity mg/l	TH mg/l	TDS mg/l	Cl mg/l
SW1	7.77	196	340	1264	18.6
SW2	7.11	124	396	1688	21.2
SW3	7.16	156	284	1188	22.2

Sample code	PH	Alkalinity mg/l	TH mg/l	TDS mg/l	Cl mg/l
GW1	7.25	212	72	208	15

GW2	7.16	194	216	354	28
GW3	7.1	164	68	183	30
GW4	7.26	210	136	96	18.4

6.5 SOIL QUALITY

Representative samples of soil from following six (6) locations have been collected and analysed colour of soil varies from Blackish to reddish brown and texture varies from clay loam to sandy loam. Electrical conductivity (EC) is a measure of the soluble salts and ionic activity in the soil. In the collected soil samples the conductivity ranged from 120 to 180 μs/cm.

6.6 FLORA AND FAUNA

Flora

The study area of this project comprises of an area falling within a radius of 10 km from the project location. The project site is devoid of vegetation. In the buffer zone, there are two types of land Forests and Agricultural land. The hills, especially the slopes, are thickly forested. Local species present in the area are Mango, Mahua, Neem, Pipal, Jamun, Chuts, Loveyer, Samar, Renuja, Chilla, Babul, Imli, Kathal, Bel, Bair and Umar etc. Besides common trees, natural vegetation which mainly includes grasses and shrubs which grows mostly during monsoon season and fades away with the onset of summer (grazed by animals).

Fauna

The natural fauna in the area are birds, reptiles and animals like foxes, rabbit and monkeys. The fauna found in the study area are of common variety. No endangered species have been sighted in the area.

6.7 LAND USE PATTERN

A detailed land use pattern study has been carried out at macro level i.e. at tehsil level and 10 Km zone. The data was collected from Census Handbook and from

records available at Tehsil Panchayat Office. The land use pattern of the Dist. Kabirdham is as follows :

In the study area, major parts are covered by steep slopes indicating undulating hilly nature of land profile. Only about half of the study area has relatively flatter or less sloping terrain. Hill slopes are entirely covered by forests.

The forest is the predominant land use covering about more than 70% of the total land. Rest of area is covered by village area and agricultural activities. However, the area under “Water bodies” changes substantially from monsoon to summer. Land under “Roads” is very less (1.1%) which indicates poor communication between the villages.

APPROXIMATE LAND USE IN STUDY AREA

Land use category	**Area (Sq.km.)**	**Percentage**
1. Agricultural land (irrigated + un-irrigated)		
2. Forest area		
3. Built up land (Land under village hutments)		
4. Grazing land		
5. Waste land (rocky)		
6. Water body		
7. Road		
Total		

Land use Pattern in the Lease Area

There is no forest land in the core zone plateau. In the 38.211 ha (94.42) acres of lease hold area, 64.35% is Government Revenue Land and the rest 35.64% is privately owned land. The private land is used for agriculture only.

6.8 SOCIO-ECONOMIC CONDITIONS

The study area falls in Kabirdham Development Block of Kabirdham district. The district is dominated by rural population (about 83% of the total population). Scheduled tribes account for about 33% of the total population. Total work force of Kabirdham Block is reported to be about 45% of the total population. The population density is observed to be 218 per square kilometer. The decennial population growth rate is about 19%. An examination of the occupational pattern reveals that about 92% of the total main workers are engaged in farming or in associated activities either as cultivators or as agricultural laborers. Thus, it can be inferred that a major portion of the population derives their livelihood from agricultural sector.

ESTIMATED BASIC STATISTICS OF THE STUDY AREA

1. Households	2628
2. Population	14966
Male	7530
Female	7436
3. Schedule Tribe	9728
4. Literacy Rate	15%
5. Occupational Pattern :	
(A) Main workers	54.1%
(% of total population)	
i) Cultivators (% of Main Workers)	82.4%
ii) Agricultural Labors (% of Main Workers)	15.5%
iii) Other Workers (% of Main Workers)	2.1%
(B) Marginal Workers	2.3%
(% of total population)	
Total working population	56.4%
(% of total population)	

DIFFERENT AMENITIES IN KABIRDHAM BLOCK

1.	Total No. of villages	181
2.	EDUCATION	
	Primary Schools	174
	Middle Schools Higher	30

	Secondary Schools Degree College	4 1
3.	HEALTH FACILITIES Hospitals P.H.Cs & Adl. P.H.Cs Community Health Centers Subsidiary Health Centers	 1 1 1 23
4.	POLICE STATIONS	30
5.	POSTAL FACILITIES Post Offices Telegraph Offices	 41 1
6.	ROADS Pukka Roads Kuchcha Road Villages connected with roads	 181.4 km 121.4 km 100%
7.	INDUSTRIES (1997) Agricultural based Animal husbandry based Forest based Conventional Industries	 86 180 6 1028

7. IMPACT ASSESSMENT

Mining activities is bound to have an adverse impact on existent environment. An understanding of the nature and extent of various impacts is essential in devising the methods and advance planning to mitigate the impacts and ultimately restore the land to useful conditions.

8. IMPACT EVALUATION

An attempt has been made to evaluate the impact of project in terms of both quality and quantity by using modified matrix method for crucial environmental parameters. The environmental impact evaluation of possible effects as a result of proposed additional mining area is primarily based on study of objectives, process, surrounding environment etc. The aspects such as water, air, land and related issues have been assessed on the basis of mining operations for similar activity. The environmental impacts identify the possible relationship of proposed mining operations with respect to environmental parameters. Their relationship can be beneficial or adverse and can be further classified as short term, long term, reversible, irreversible, local or regional. The evaluation of the impact of proposed activity are presented in Table below

Parameters	Weight PIU	Baseline EIU (a)	Without EMP EIU (b)	With EMP EIU ©	Change EIU (c-b)	Change EIU (c-a)
Biological Environment	**300**	**195**	**184.25**	**197**	**10.75**	**2**
Environmental Pollution	**450**	**343**	**322**	**351**	**29**	**8**
Aesthetic	**100**	**77.25**	**66.25**	**75.85**	**9.6**	**-1.4**
Human Interest	**150**	**114.75**	**111.75**	**127**	**15.25**	**12.5**
Grand Total	**1000**	**730**	**684.25**	**750.85**	**64.6**	**21.1**

9. ENVIRONMENT MANAGEMENT PLAN

9.1 Reclamation of Land

The land reclamation of the worked out area will be done by the backfilling of the overburden. The laterite capping (Overburden) will be dumped properly and it will be levelled in a fashion that the dump height remains be uniform in all sides and subsequently it will be used for back filling the degraded land as far as possible. Reclamation operation will commence after taking full thickness of Bauxite deposit in the area and obtaining permission from IBM. The above waste and overburden shall be managed as per the approved mining plan.

In addition, utmost care and regular inspection schedule shall be made to prevent any fugitive emission of dust during transportation of material from one place to another.

9.2 GREEN BELT DEVELOPMENT

The massive afforestation planned for the project shall generate a forest having greater tree density (about 75 trees for first two year per 750m^2). The proposed extensive will enhance the vegetation quality as well as aesthetic quality of the area. Thus there is no adverse impact is envisaged over biological environment due to ongoing mining activity.

Below is showing 5 yearly stage wise forest land development In order to show the backfilling rate and afforestation rate (on backfilled land) cumulative available

broken land, back filled area generation and Overall, the project will have a very strong positive effect on flora.

Year	No. of Trees	Area Covered in m^2	Survival rate	Location (7.5m Barrier Zone)
1st	75	750	80%	Southern East
2nd	75	750	80%	Southern East
3rd	120	1200	80%	Southern East
4th	120	1200	80%	Southern East
5th	120	1200	80%	Southern East

9.3 POLLUTION CONTROL MEASURES

The proposed additional mining operations are not anticipated to raise the concentration of the pollutants any more as expansion is only enhance the life of project. However, following measures have been / would be adopted to mitigate the pollution.

- Measures to prevent Generation and Dispersal of Dust
- Measures to Control Air Pollution due to Airborne Dust
- Surface Water Pollution Control Measures
- Ground Water Pollution Control Measures
- Noise Pollution Control Measures
- Noise Pollution Control Measures
- Measures to reduce Ground Vibrations

9.4 MEASURES TO IMPROVE SOCIO-ECONOMIC CONDITIONS

The impacts of the project would be felt in an integrated manner on the socio-economic environment in the study area. There is no village in core zone and further no displacement is required for the proposed project and therefore impact will be positive side rather negative. The impacts on the different components viz employment, housing, educational, and medical and transport facilities, fuel availability, economics, status, health agriculture is not significant because size of project is very **small.** However, it would definitely increase the employment

opportunity (primary as well as secondary) in the project area. Some of these impacts would be beneficial.

i) The project will have a strong positive employment and income effect, both direct as well as indirect.

ii) Migrant-Non migrant ratio shall shift towards migrant side. This will happen because of (i) better employment opportunities due to this project and (ii) relatively low agricultural yield through traditional agricultural practice with monocrops.

iii) The project shall speed up the growing view on importance of education among people in study area.

iv) The project is going to bring about changes in the pattern of demand from food to non-food items if sufficient income is generated.

v) The project is not going to influence the existing traditional agricultural situation significantly. It may help to improve agricultural production by way of providing additional income to the farms from supplementary sources.

People perceive that the project will bring handful gains by way of creating significant job opportunities along with development of social infrastructure.