

# EXECUTIVE SUMMARY

## ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PLAN

(Submitted for Public Consultation Process as per EIA Notification 2006 & amendments thereof)

### Rasuli Iron Ore Deposit

Area 220 Ha. (Forest Land)

Rasuli Village, Bhanupratappur Tehsil, Kanker District, Chhattisgarh

#### PROJECT PROPOSAL

Iron Ore Mining of 45000 TPA

#### PROJECT PROPONENT



**M/s NAVBHARAT FUSE CO. LIMITED**

Steel Division, Navbharat Udyog Bhavan

Ring road No-1, Telibandha, Post Ravi Gram, RAIPUR (CG)

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#### ENVIRONMENTAL CONSULTANTS



**Bhagavathi Ana Labs Pvt Ltd**

**[A Bureau Veritas Group Company]**

May 2016





EIA & EMP Report of Rasuli Iron Ore Deposit of M/s Navbharat Fuse Co Ltd located at Rasuli Village (Forest Area) Bhanupratappur Tehsil, Kanker District, Chhattisgarh.

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### EXECUTIVE SUMMARY OF THE PROJECT

#### INTRODUCTION

M/s Navbharat Fuse Co. Ltd. is a sponge iron producing outfit located its Sponge Iron plant in Raykot, 30 km away from Jagdalpur on NH-16. The applied mine lease area is for the captive purpose of the sponge iron plant of the company.

The area applied mine lease area is located in jurisdiction of Forest range of Bhanupratappur Division, District Kanker (CG). The applicant has been granted PL of the area by the State Govt. order NO.F 3-115/2003/12, Raipur Dated 18.07.2006. The proposed area was prospected by diamond core drilling which was permitted by forest authority to obtain sub-surface information in the area. However, even for core drilling there was further condition imposed by forest department, that the bore hole must be closed after sample has been taken from the core. The initial prospecting has been carried out in the area which has established a good deposit of Iron Ore.

Subsequently, applicant has applied for mining lease by the letter of intention of Govt. of Chhattisgarh for preparation of Mining plan vide order no. F 3-44/2007/12, Raipur dated 1st July 2009 for Iron ore mining over an area of 220.00 Ha.

#### PROJECT DESCRIPTION

The proposed area is located in the Jurisdiction of village Rasuli in District Kanker (CG) and included in Survey of India Toposheet No 64D/15. Regionally, the proposed mine lease area is a part of south – eastern extension of Dallirajhra & Mahamaya Mines which is known as a Rasuli hill range in Khadgaon protected forest of Bhanupratappur forest division. The Rasuli hill range, on which the proposed area is located, is a steeply sloping hill. The hill range showing broadly NE – SW alignment is located at its top which is about 2 km away NW of village Rasuli range rising from the ground level of about 414 m to 734.9m AMSL.

The topography is extremely controlled by the geology of the area, and is pointer to its Lithology and structure. The proposed mine lease area is drained by a system of nallah originating from the eastern and western slopes of the hill.

#### *Drainage*

The topography of the area is hilly in nature and there are as such no water sources in the area from which inherent seepage of water will occur and for this reason this area does not require any specific drainage pattern. It is observed from the Surface Plan that there are few small nallahs emitting from the area which acts as relief of the area during rainy season as the deposit resemble the shape of small hillock. The water table as observed in the area is at 380 MSL

#### *Salient Features of Mining*

- The proposed project envisages production of 45000 Tonnes / annum of Iron ore
- It is proposed to carryout float ore mining operation with jack hammer drilling and blasting for hard formation





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- The pit shall have only a single bench of average depth of 2.5m.
- The gradient of level roads shall be kept at 1:16.
- The mining operations shall be carried out in single shift of 8 hours for 300 days in a year.
- The maximum annual production of 45000 TPA and mineable reserves as 0.38 million tonnes

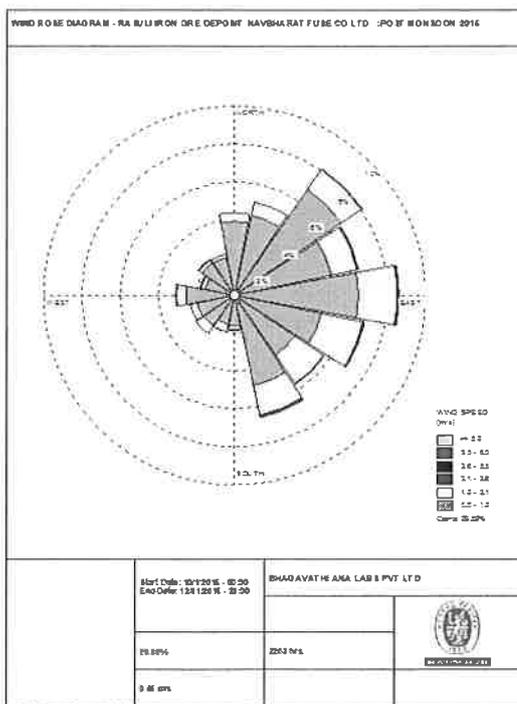
Estimated Probable Geological Reserves	9.028 million tonnes
Estimated Mineral Resources	2.019 million tonnes
Estimated float ore Geological Reserves	0.38 million tonnes
<b>Total</b>	<b>11.427 million tonnes</b>

- The employees required for the project are 212 nos. Since the transport of iron ore is done by tipper vehicles about 50 people of adjoining villages are indirectly associated with this transport system and also petty contingent works connected with mining.
- Total water requirement in the mine is about 8 KLD.

### DESCRIPTION OF THE ENVIRONMENT

#### Meteorology (Post Monsoon 2015)

The predominant wind direction during study period is blowing from east sector





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**Study Area:** The Environmental studies are carried out in an area of 10 km radius around the ML area.

### Ambient Air Quality

The scenario of the existing Ambient Air Quality in the study region has been assessed through a network of 10 Ambient Air Quality locations during Post Monsoon 2015 (October – December 2015). The summary of Ambient Air Quality monitoring results are given below.

#### Summary of Ambient Air Quality (Units: $\mu\text{g}/\text{m}^3$ except $\text{CO}$ $\text{mg}/\text{m}^3$ )

LOCATION	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>
Mine Lease Area	50.4	16.0	8.6	13.0
Kalwar (Primary School)	51.8	16.5	8.2	13.6
Kosmi (Middle school)	52.1	16.7	8.7	12.7
Kumurkatta (Primary School)	53.0	16.9	9.0	14.3
Nergaon (Higher Middle School)	48.6	15.3	7.2	10.3
Rasuli Village (Primary School)	50.3	15.9	7.1	10.8
Boriya (nirmal gram panchayat)	48.9	15.4	7.0	10.8
Dorba (gram panchayat)	50.9	16.1	7.4	10.3
Raja Boriya	51.7	16.3	10.2	15.1
Kapinkarka	50.4	16.0	8.6	13.0
<b>Standard (Core &amp; Buffer Zone)</b>	<b>100</b>	<b>60</b>	<b>80</b>	<b>80</b>

Source: Primary Data collected by Bhagavathi Ana Labs Pvt Ltd.

### Noise Level

A preliminary survey was undertaken at 14 locations during study period, to identify the major noise generating sources in the area. Summary of noise level data of different locations are given below.

#### Summary of Noise Levels during Study Period [Units: dB(A)]

Code	Location	Day-Equivalent, Ld	Night Equivalent, Ln
N1	Mine Area	43.0	38.7
N2	Kumurkatta (Primary School)	43.5	38.9
N3	Kalwar (Jhitketola Primary School)	41.4	37.6
N4	Kosmi (Middle school)	42.1	38.9
N5	Gotulmura (near primary school)	41.7	39.1
N6	Kamansur	44.0	39.7
N7	Naghur	44.3	39.8
N8	Kalagaon	42.2	38.5
N9	Nergaon	42.9	39.7
N10	Rasuli	42.5	39.9
N11	Boriya	45.3	40.9
N12	Seoni	43.2	39.6
N13	Bhatgaon	42.6	38.9
N14	Dorba	44.2	38.6





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### Water Quality

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

#### Summary of Water Quality Test Results

S. No.	Parameter	Unit	Surface Water	Ground Water	Desirable limits as per IS: 10500
1	pH	-	6.61 – 7.0	5.92 – 6.99	6.5 – 8.5
2	Total Dissolved Solids	mg/l	112 – 175	98 – 500	500
3	Total Hardness as CaCO <sub>3</sub>	mg/l	65 – 120	35 – 375	300
4	Chloride as Cl	mg/l	8 – 10	10 – 95	250
5	Iron as Fe	mg/l	0.02 – 0.03	0.02 – 0.08	0.3
6	Fluoride as F	mg/l	0.1	0.2 – 0.3	1.0

### Land Environment

Soil Sampling was carried out at 7 locations and the analysis results shows that the soil quality is moderately fertile in nature.

Out of 220 ha of mine lease area, it is proposed to disturb only 41.6155 ha upto conceptual period of float ore mining.. The changed land use will be restored back through backfilling and afforestation to maintain proper land during regular mining activity and at the conceptual stage.

#### Land use pattern (ha)

S. NO	DESCRIPTION	PRESENT	SCHEME PERIOD	CONCEPTUAL
1	Area to be excavated	-	9.784	21.5915
2	Backfilled area (out of 1)	-	7.060	7.060
3	Storage of top soil	-	0.21	0.21
4	Overburden dump	-	0.939	6.065
5	Mineral storage	-	0.75	0.75
6	Infrastructure (workshop, adm building, crushing plant)	-	0.29	0.29
7	Roads	-	2.91	4.71
8	Green belt	-	4.0	4.0
9	Township (Temporary rest house)	-	2.999	2.999
10	Undisturbed area	-	198.118	178.3845
<b>Total</b>		<b>220.00</b>	<b>220.00</b>	<b>220.00</b>

\* Entire mined out area shall be backfilled and afforested concurrently till the conceptual stage





## **Biological Environment**

A primary field study was conducted in core as well as buffer area. The consolidated list of flora and fauna was prepared based on primary field visit and information from published literature and working plan of forest department. Further the survey was made in confirming availability of potential endemic and or endangered fauna, if reported, and the likely impact due to proposed project.

A detailed conservation plan has already been prepared by M/s Navbharat Fuse CO Ltd under the guidance of Retd PCCF

## **Socio-Economic Environment**

In the study area there were 2 districts area comes namely Uttar Bastar Kanker and Rajnandgaon. From the 2 districts total 04 tehsils covers 63 villages, no town area comes under the study area

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

### **Ambient Air Quality**

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

From the proposed iron ore mining, dust concentration in the ambient air will increase apart from increase in the concentrations of Sulphur dioxide (SO<sub>2</sub>) and Oxides of Nitrogen (NO<sub>x</sub>) from diesel operated excavator, loading equipment's and vehicles plying on haul roads.

To assess the impact due to production of 45000 TPA of Iron Ore on air environment, predictions have been carried out using ISC – AERMOD MODEL.

The maximum predicted value of increase in PM due to proposed enhancements in mining operations would be about 4.7µg/m<sup>3</sup>. This concentration will be observed within the core zone where mining operations are being carried out. The concentration was found to reduce to a value of less than 0.5µg/m<sup>3</sup> at a distance of about 0.5 km from the mining operations.

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

- Development of 7.5 m wide green belt with tall growing trees and thick foliage cover along mine lease boundary to arrest dust. This will also help in attenuating noise.
- Minimizing dust generation during excavation by water sprinkling at working face.
- Proper maintenance of the haul roads and regular water sprinkling to minimize the generation of air borne dust due to movement of tippers on it.
- Water spraying at the loading and unloading points to reduce fugitive dust emissions.
- Plantation will be carried out on mined out areas.
- Overloading and over-speeding of trucks will be prohibited.



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- Mineral transportation will be carried out by trucks covered with tarpaulin.
- Development of thick plantation to reduce the spread of air pollution in surrounding areas.
- Village roads used by the company will be maintained to avoid fugitive dust emissions.
- Dust masks will be provided to workers working in high dust generating areas.

### Noise Level

#### *Impact on Noise Levels*

Noise will be generated due to drilling and blasting activities, mineral and waste transport, etc. It is estimated that on the existing road, additional traffic load. Noise level at boundary will be less than 45 dB (A).

#### *Control Measure of Noise Pollution*

Noise levels will be kept within acceptable limits by:

- Limiting of speed of haulage vehicles/tippers.
- Regular maintenance of transport vehicles.
- 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.
- Plantation along the mineral transportation roads in nearby villages.

### Water Environment

#### *Impact on Water Environment*

Mining activities cause adverse impacts due to mine drainage, siltation due to storm water and contaminated water from domestic sewage water. Water for dust suppression and plantation will be obtained by tankers from nearby villages and ground water from nearby village will be provided for drinking. Rainwater accumulated in mine pits, whenever available, will be used for dust suppression and plantation. There is no wastewater generation from mine.

#### *Water Conservation Measures*

The only pollution anticipated in the surface drainage water is the suspended solids, due to run off from mine workings. For this purpose check dams with garland drain will be constructed and if necessary the same will be strengthened. A garland drain is also proposed surrounding the mine workings to collect any run off from the mine workings. The discharge from these drains will be diverted to an unused pit workings, which allows the sediments to settle.

### Land Environment





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### ***Impact on Land use and it's Management***

The changed land use will be restored back through backfilling and afforestation to maintain proper land during regular mining activity and at the conceptual stage.

### ***Impact on Biological Environment and it's Management***

The tree species found within the core zone represent the common type of forest flora species along with small shrubs and bushes. Due to mining activities community structure of the vegetation will not change. But the number of plant species of the area will be reduced to certain extent due to the clean-up of the land for different mining activities. With the provision of retention walls, garland drains, supply of water for irrigation, establishment of greenery over the backfilled areas, there shall be reduction in soil erosion and improvement in vegetation growth. Thus the quality of land use will also improve.

The project authorities aim to reclaim majority of mining lease area with better environmental quality indices by raising of maximum plantation compared to the present scenario by backfilling major portion of the mined out area and growing vegetation and creation of water storage reservoir in the balance portion of the worked out pit. This will improve the floral content and attract fauna to the mined out area. Thus the project shall ultimately contribute to the improvement of the eco system of the region.

### **Socio- Economic environment**

The mine management will take adequate air pollution control measures like green belt plantation, regular water sprinkling, controlled blasting, etc to control air pollution due to the mining activities. Regular water sprinkling will be carried out on haulage roads used for mineral transport. Mineral transportation will be carried out in trucks covered with tarpaulin. Speed of the transportation trucks will be regulated. Plantation will be carried out along the mineral transport roads. Regular air quality monitoring will be carried out in nearby villages to assess the efficacy of the air pollution control measures adopted in the mine.

Noise from the mining activities will be controlled by regular maintenance of the mining machinery and transport vehicles. Silence zones will be declared near village habitations. Speed of the transport vehicles will be regulated. The mining and mineral transportation will be carried out only during day time.

Awareness programs will be conducted in nearby villages for road traffic and safety. Only trained drivers will be deployed for mineral transportation activities. The roads used for mineral transportation will be widened, strengthened and will be regularly maintained by the company. Traffic rules will be strictly complied. Traffic signals, speed breakers, traffic marshals, foot path, etc will be provided at strategic places near village habitations to avoid accidents.





## **ENVIRONMENTAL MONITORING PROGRAMME**

Monitoring of ambient air quality, ambient noise levels, surface and ground water quality, soil quality, plantation and green belt in the mine lease area, etc. will be carried out as per the applicable guidelines and the reports will be submitted to the corresponding regulating authorities. An Environment Management Cell will be formed for implementation of the monitoring programme and the environmental management plan.

## **PROJECT BENEFITS**

The people residing in the nearby villages will get following benefits:

- Direct and indirect employment opportunities
- Drinking water, Medical and educational facilities
- Improved communication and infrastructure facilities
- Vocational training to women
- Compensation for loss of land / house

## **Need based Assessment**

The villagers were contacted during the socio-economic survey and were discussed regarding their expectations from the company. The major expectations are given below:

- Employment to local people in the company
- Education Facilities
- Drinking & Irrigation Water Facilities (Bore well & Tank)
- Drainage system
- Control of Pollution
- Promotion of Cultural Programmes
- Road facility
- Transportation Facility
- Village wise Construction of Community halls and mini libraries
- Vocational Training programme

## **Biological Environment**

### ***Afforestation***

It is proposed to have plantation surrounding the lease boundaries in phased pattern to minimize land/dump erosion. It is proposed to have plantation at the rate of 1000 saplings per year. Saplings will be planted in the following manner.

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**TABLE 8.3: YEAR-WISE AFFORESTATION PROGRAM**

Year	Number	Area Proposed (ha)	Survival Rate
I	1000	1500 m <sup>2</sup>	80 %
II	1000	1500 m <sup>2</sup>	80 %
III	1000	1500 m <sup>2</sup>	80 %
IV	1000	1500 m <sup>2</sup>	80 %
V	1000	1500 m <sup>2</sup>	80 %

However, the practice of afforestation programme and other control measures shall bring greenery to the area and also the vegetation of mixed species and availability of green cover shall prompt the migration of birds and wild life from surrounding places.

### **Socio-Economic Benefits**

The company has allocated a budget for carrying out socio-economic welfare activities as mentioned in the above paragraphs. The amount earmarked in the budget will be separately kept and will not be used for any other purposes. The budget may be increased as per the actual requirement during the implementation stage.

### **Occupational Health and Safety**

Occupational safety of the workers in mining area will be achieved by the following:

- Providing a working environment that is conducive to safety & health
- The management of occupational safety & health is the prime responsibility of mine management from the executive level to the first line supervisory level
- Employee involvement and commitment in the implementation of health and safety guidelines
- Periodical health checkups
- Provision of all necessary resources
- Implementing safety and health management system and assessing the effectiveness through periodic audits
- Setting of safety and health objectives based on comprehensive strategic plans and measure and assessing performance against these plans
- Monitoring the effects of mining activities on safety and health and conducting regular performance reviews
- Provision of necessary personal protective equipment's
- Establishing and maintaining a system of medical surveillance for employees
- Ensuring employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities



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### Budget for Environmental Protection

A budgetary provision has been made for implementation of all the environmental protection measures in a time bound manner.

*Rs: Lakhs*

S. No	Activity	Capital investment	Recurring expenses / annum
1.	Environmental pollution control	26.00	10.00
2.	Environmental monitoring	0	9.00
3.	Green belt and afforestation	5.00	4.00
4	Wild life conservation	10.00	5.00
5	Occupational health and safety	8.00	12.00
6	Social & Economic Developmental activities	14.00	12.00
7	Miscellaneous	3.00	1.00
	<b>Total</b>	<b>66.00</b>	<b>53.00</b>

### CONCLUSION

The proposed mining activities will lead to the sustainable development of the nearby areas. There will be development of educational, medical and infrastructural facilities in the area. The mining and allied activities will provide direct and secondary employment opportunities for local people. This will lead to the improvement of economic status of the nearby villages. The mining will also benefit the state by way of excise duty and revenue on mineral.

During the active mining period, the pollution will be controlled within permissible limits by way of adopting various control and mitigation measures. Thus, the mining activities will be congenial with the environment and economy of the area.

