

**EXECUTIVE SUMMARY OF
RAPID ENVIRONMENTAL IMPACT
ASSESSMENT
&
ENVIRONMENTAL MANAGEMENT PLAN
(2008 - 2009)**

OF

**Expansion Proposal of Unchabali Iron &
Manganese Ore Mines of
Smt. Indrani Patanaik
Keonjhar District of Orissa**

**(From 0.21 MTPA to 4.0 MTPA of Iron Ore
Production)**

**Mining Lease Area: 106.1127 Ha.
In Unchabali & Balda Villages of Keonjhar
District of Orissa State**

**Prepared by
ERS (I) PVT. LTD., BHUBANESWAR
&
EMPRES, CHENNAI**

Executive Summary

1. PROJECT DESCRIPTION

Introduction

The Unchabali Iron & Manganese Ore Mines of Srimati Indrani Patanaik is situated in Mahaparbat Pahad in Unchabali & Balda villages under Champua sub division in Keonkhar district of Orissa state.. An area covering 106.4728 hectores was granted for P.L in favour of Smt. Indrani Patnaik on 5.3.98 for a period of two years. Subsequently, the mining lease over an extent of 106.1127 ha. has been granted on 15.09.98 and the same was executed on 05.02.1999 for iron and manganese ores after excluding 0.3601 Ha.

The lease covered in revenue land was subsequently declared as forest land by the district level committee as per the instruction issued by the Apex Court in Dec'96. The forest area under DLC in the lease covers 103.342 Ha. which attracted FC Act'80. Proposal was thus prepared and submitted to obtain approval under the provision of Sec- 2 of FC Act'80 over an area of 35.275 Ha. of forest land under DLC category to commence the mining operation, which was approved. For the balance forest area of 68.157 ha clearance under FC Act 1980 is applied and is under process.

This Mining lease area forms part of the mining lease earlier held by Orissa Mining Corporation from 1963-1983. During this period, Orissa Mining Corporation has undertaken exploration for the total area of 686.75 ha. and located about 6 deposits of iron ore. The exploration includes geological mapping, pitting & trenching and sampling of iron ore at strategic location and sinking of bore holes to assess the iron ore resources of the area. On expiry of the lease period of Orissa Mining Corporation, Smt. Indrani Patnaik has applied for mining lease over an area of 106.1127 ha. and the lease was granted vide letter No- III(A) ST 32/ 98 dated 08.05.98. Mining plan was submitted and approved under Rule – 22 of MCR, 1960 (Amendment – 1987) for execution of the lease.

The lessee has prepared and obtained approval for Mine Plan vide letter CAL/KJ/Fe& Mn/MP-574 dated 01.01.99. Subsequently the lessee has prepared a PMCP under Rule 23(b) of MCDR -1988 which was approved vide letter BBS/KJ/Fe & Mn /PMCP- Unchaballi dated 07.03.07. The lessee further amended and modified mining plan which is approved vide letter no. 314(3)/2009 dtd 21st October 2008, office of Controller of Mines, Central Zone, Indian Bureau of Mines.

With the increase in demand for steel manufacture/ sponge iron, the demand for suitable grade of iron ore has also increased. To meet the increased demand of Iron Ore to cater the needs of these plants it is proposed to increase the iron ore production form this mine also.

Environmental Clearance for production of 0.21 MTPA was obtained vide MoEF letter No. J-11015/356/2005.IA.II(M) dated 05.06.2006. Present proposal is for production of 4.0 MTPA.

Srimati Indrani Patanaik retained M/s Environmental Research and Services (India) Pvt. Ltd. Bhubaneswar and EMPRES, Chennai, for preparing Environmental Impact Assessment Study for Unchabali Iron & Manganese Ore Mines. The objectives of EIA study are to establish baseline scenario with respect to one season data for report on different environmental components viz. air, noise, water, land, biological and socio-economic including parameters of human interest, identification, prediction and evaluation of significant impacts; evaluation of existing pollution control facilities, and preparation of cost-effective and appropriate Environmental Management Plan as per the EIA Notification dated 14th September 2006.

Location & Accessibility

The mining lease area is located in Mahaparbat Pahar in village Unchabali & Balda in Champua Sub-division, Barbil Tehsil, District - Keonjhar of Orissa State. The mining lease is 106.1127 Ha falls under DLC Forest, The area is covered in the Survey of India Topo sheet no. 73 G/5. The Lease area is bounded by the Latitudes 21⁰52'41" to 21⁰52'41" N and Longitudes 85⁰25'35" to 85⁰26'01" E. There is no hamlet or village within the leasehold area. The Mining lease area is approachable from Joda covering a distance of 25 km by Express Highway no. 2 upto Bamebari and then 4 Km to Unchabali by a fair weather motorable road. The nearest railhead is located at Jurudi at a distance of about 12 Kms and the nearest railway station is Barbil Telecommunication facilities are fairly well developed in the region. Electronic telephone exchange is functioning in Joda. Besides all the surrounding villages have STD facilities. Besides this, the leases have multi line telephone connections and E-mail facilities. The communication within the mines is through walkie-talkie. Almost all the surrounding villages has post and telegraph facilities. Few public transport buses and private buses ply at lesser frequency in the village areas from Bamebari, which is likely to be improved with commencement of mining activities.

Project Description

Unchabali Iron & Manganese Mines of Smt. Indrani Patanaik is a part of the "Horse Shoe" shaped iron ore geosyncline (Jones, 1934) representing the famous Singhbhum-Bonai-Keonjhar iron ore belt. Geologically the terrain forms a part of oldest metasedimentary formations of pre-cambrian age locating a number of economically important iron & manganese deposits.

The Precambrian iron ore group of rocks comprise of lower volcanics and tuffs, shales & Banded Hematite Jasper (BHJ) with iron ore and upper shales. Economic mineral deposits of iron & manganese ore are confined to BIF and shales respectively. The host rocks which forms a part of the eastern limb of

the famous horse-shoe shaped, Bonai synclinorium are in consonance with the disposition of the measure structural element.

The laterite with float iron ore, insitu iron ore is located in the Northern part as well as Central and Southern Portion of the lease.

The reserve was estimated under proved, probable and possible categories for iron ore. The reserve has been calculated by cross-sectional area method. The summary of ore reserve estimated are given the following **Table No - 01**

**Table No- 01
Summary of estimated ore reserve**

Category	Reserve (MT)
Proved Reserve	: 19996431 MT
Proved Float Ore	: 2451960 MT
Probable Reserve	: 4101176 MT
Possible Reserve	: 4323915 MT
Total Reserve	: 30873481 MT or 30.87 Mil.T

Mining

The method of working is opencast mechanized mining considering various technical parameters like surface topography, continuation of iron deposit, quality variations, geo-technical aspects, required rate of production etc., It is proposed to work this deposit by adopting 10.0 m bench height and with width more than the height of benches i.e more than 10 m, with an ultimate pit slope of 45°. The benches shall be 10.0 m in height and the ramp gradient shall be kept minimum of 1 in 16. The production of ore, intercalated waste & sub-grade from the mine is given following in **Table No. - 02**.

Table No. - 02

Year	RL	Production Ore (MT)	Waste (Cu.m)	Sub-grade (MT)
2008-09	Upto 580 RL	4002431	1707160	276939
2009-10	Upto 560 RL	4005016	774954	403324
2010-11	Upto 560 RL	3998586	1045399	489623
2011-12	Upto 540 RL/ Upto 630 RL	4000875	614646	489903
2012-13	Upto 620 RL	4010552	413811	491088
Total :		20017460	4555970	2150878

Conceptual Mining Plan :

This deposit will be mined by the conventional open cast mining with deployment of heavy earth moving machineries. The production of Iron ore from this mine would be around 40,00,000 tonnes per annum.

The working of iron ore is limited to the main quarry only. The conceptual planning for has been projected around the ore zone up to a depth of 540 mR.L .

Mineable reserve estimated	:	30873481 MT	
Production planned for five years Of the plan period	:	20017460 MT	
Hence reserve available for conceptual mining 20017460	:	30873481	-
			= 10856021 MT

During the life for the mine 87.050 hectares will be utilized for mining, storing of minerals, dumping etc . The detailed land use pattern is given in **Table No. 03**.

Table – 03
(Break-up of the Land Use During Life of the Mine)

Features	Existing	Planned period	Beyond plan period	Total
Mining	5.65	65.9557	18.662	84.617
Dumping yard	0.90	6.965	-	6.965
Construction of roads	0.45	0.70	0.40	1.10
Infrastructure like site office, Crusher, screen and others	0.14	1.90	NIL	1.90
Sub Grade Stacking	0.75	1.20	NIL	1.20
Railway line & siding	NIL	6.05	NIL	6.05
Safety Zone	NIL	4.28	NIL	4.28
Future Exploration	98.2227	19.062	NIL	Nil
Total	106.1127	106.1127		106.1127

Reclamation will be started from 4th year (2011-12) onwards. Safety zone will be developed all along the lease over an area of 4.28 hectares. The waste dumped in the waste dump will be utilized for refilling. After re-handling the dumps the area will be covered with afforestation.

The waste generated during the year wise plan period will be 4.555 MCM, 35% of the waste generated will be used for road making, repair and maintenance and the rest of the waste will be put in the waste dump or re-handled.

The waste generated during the 3 years the plan period will be accommodated in the 2 waste dumps situated in the Western and Central portion of the lease. The waste will be utilized for refilling portion of the worked out pit during the conceptual period as given in the following **Table No. – 04**.

**Table No. –04
(Schedule of Refilling)**

Sl. NO	Dump	Location	Dimension (L x B)	Height (M)
1	Dump - 1	Western side of the lease	455 *125	35 m
2	Dump - 2	On the Central portion of the lease	125*100	35 m

The total waste generation to mine the remaining quantity of 10.85 Mil.T, 1.49 MCM quantity of waste will be generated, which is inclusive of intercalated waste and sideburden. The remaining waste generated will be utilized for refilling the worked out areas.

Power requirement: The power requirement for the mining operations will be met from the two numbers of 750 KVA capacity DG sets, which will be catering only to the lighting requirements of the mining operations, site office, canteen, first aid room etc.

Water Requirement: The total water requirement for the said expansion production will be 150 KLD per day. Consumption of water will be mainly for the following purposes:

- Plantation in dump and reclamation areas,
- Drinking water in canteen, toilets and in various buildings,
- Haul road sprinkling, permanent sprinkling at main road haul road and dust prone crushing and screening areas.

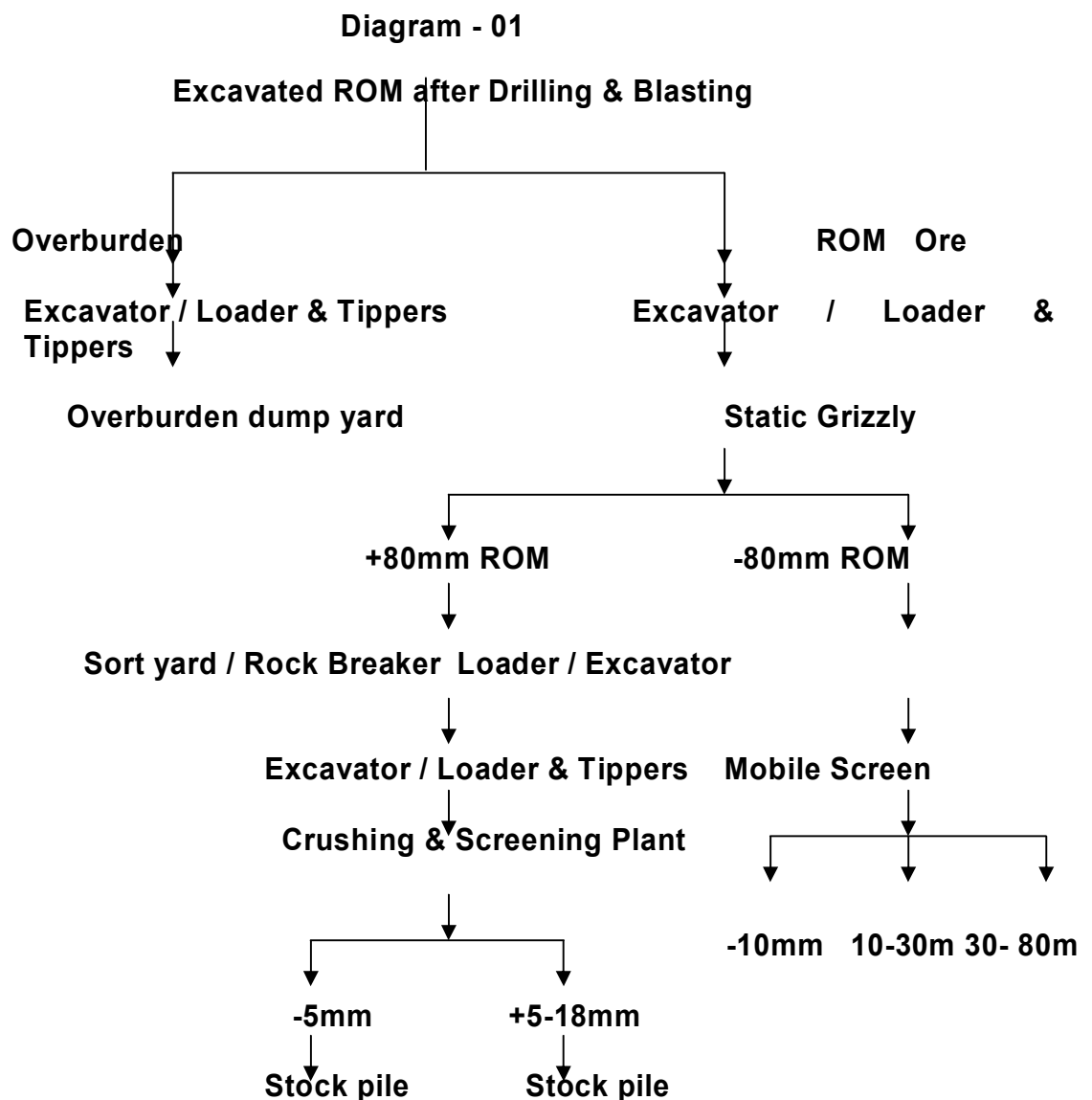
Employment Potential : The operating mine has equipment and manpower, which will be increased and improved to meet the expansion requirements of the project. Three shift operation will be adopted to meet the enhanced production requirements. The man power required for the operation of the mine will be recruited mostly locally. For the project activities the management has adequate personnel for planning and monitoring, while a substantial part of the project work can be outsourced. As planned, various activities after expansion such as security, canteen, transport, plantation, sanitation etc. also would continue to be outsourced or managed through contracts. Besides this, exploration, analysis and mine planning have also been envisaged to be outsourced. On regular basis, local people would be preferred for engagement through contracts for various services to be provided as given in **Table No. - 05**.

Table No. – 05

Sl. No	Category	Numbers
1	Technical/operating Personnel	9
2	Supervisory Personnel	8
3	Assistants to operating personnel(Mining)	11
4	Repair & Maintenance staff	7
5	Assistants to repair & Maintenance staff	6
6	Administrative Staff	7
	Sub Total	48
7	Skilled, Semi Skilled and unskilled mine workers	412
	GRAND TOTAL	460

Associated Operations: Mining Operation is broadly of two types. One is mineral raising and the other one is mineral processing.

Stages of mineral raising is given in the following **Diagram No. – 01**



Mineral Processing: The iron ore, mined from the mines require sizing, dressing, sorting/screening, blending etc. before the finished product is ready for despatch. For this purpose 400 TPH stationery crushing unit is proposed in the lease area. In addition to this a total of 1000 TPH screening plant is also proposed.

The final production below roughly account for 70% cumulatively of the total excavated material, which is the recoverable ore for the market. These products would be stacked separately as per specifications for dispatch to respective customers.

The average grade of iron ore is observed to be 63% Fe, the cut-off being fixed at 58% Fe. The generation of sub-grade material is 10% or less after sorting, sizing and screening etc can be blended in future with high grade ores. Hence the stacking of sub-grade materials is temporary since these ores can be marketed after blending with high grade ores at a favorable situation in future.

2. DESCRIPTION OF THE ENVIRONMENT

The M.L. area displays an undulated topography with a prominent hillock in the eastern side. Altitudes vary between 530m RL (lowest) in the Northern portion of the lease to 720m RL (highest) in the central portion of the lease at the hill top of Mahaparbat. Mahaparbat hill is the prominent geomorphic unit in the south-eastern portion of the area. The gradient of the area varies from 1: 0.8 to 1:36.

With regards to other topographical features of the ML area or the core area is concerned, it is a combination small hillocks, valleys and plain land. The Baitarani River is the only major Water Body flowing in the eastern side of the ML area at around 2 kms. Other prominent surface water bodies are Kasi Nalla flowing in the North East of the ML Area at 3.5 kms, Jalpa Nadi flowing in the South West of the ML area at 3.5 kms, Gahirajala Nala flowing in the West of the ML area at 8.5 kms, Mithida Spring is in the South SW of the ML area at 9 kms, Dolko nala is in the North of ML area at distance of 7 kms, Dalki Nala is in the South West of the ML area at 7.5 kms, Ghagra Nala is in the South SW of the ML area at 8 kms and Jagadhara Nadi flowing in the South East of the ML area at 8 kms. There is no perennial nala within the M.L area. No perennial stream passing through the ML area.

The buffer area is similarly undulating. The contour varies from 100 mRL to 956 mRL. Siddhamatha Reserve Forest and Baitarani Reserve Forest are in the NW of the ML area at 8 to 8.5 kms respectively, Chamakpura Reserve Forest is in the North East of the ML area at 7.5 kms, Khajuridihi RF is in the West of ML area at 6 kms and Nayagarh RF is in the South East of the ML area at 9 kms.

Around 30% of the buffer area is covered under various type of forests. There is also single crop agricultural land. Some manmade sal forest is also found in

the buffer area. The State Express Highway No 2 is passing in the buffer area in the NW direction of the ML area at 1 km. In general several small and medium size hillocks provide the contour to the landscape and the topography of the study area.

The buffer zone of the project area comprises 104 villages. As per topographical map, in the North East direction 31 villages, North West has 18 Villages, South West side has 30 number of villages and in South East side there are 25 Villages.

The project site is located East of State Express Highway No. 01 connecting Joda and Palaspanga at NH 215 via Bambibari and Nayagarh. Apart from these Express ways there is good communication between villages by road. It is being facilitated by a number of PMGSY roads, Village Roads and MDR. The nearest railway station is Barbil, which is at 35 kms from the ML area. The nearest air port is Bhubaneswar at a distance of 300 kms and the nearest sea port is Paradeep Port at a distance of 315 kms from the ML area. There is also an air strip at Barbil

Besides those first order surface water bodies there are also dry nalas seen in the lease hold area. Surface run off during rainy seasons follow the gradient of the terrain and pass through the natural drainage which are existing in the area. Drainage of the ML area or the core area is towards the NE side. There is one Nala flowing at the North and NE of the mining lease area at a distance of 1.5 Kms. This is perennial in nature

The soil in the area consists of soil cover followed by a weathered zone and the basement rock. Red sandy soil, red gravely soil and lateritic soil of reddish color is found in the area. The soil in the immediate vicinity of the project is silty clay loamy.

The land use in the buffer zone of study area are Agricultural land 12.76%, Settlement 2.57%, Mining 1.62%, Reserve Forest & Protected Forest 56.0%, Open Forest 13.94%, Waste land 0.38%, Road & Rail 4.15%, River Sand 0.03% and Water Body 8.55%.

The climate of the study area in general is hot and humid. Average annual maximum temperature is 38.4⁰C. April is the hottest month mean daily maximum temperature is 44⁰C. The precipitation in the monsoon season ranges between 700-993 mm. Very often the bay depressions and cyclones cross over this area affecting weather and causing wide spread rains. The annual average relative humidity is 65% but it shoots up to 90% during the monsoon period. Wind speed is generally light in monsoon seasons. Predominant wind direction in the study area for all seasons except post monsoon is NNE.

The monitoring of SPM, RSPM, SO₂ and NO_x levels were carried out at nine locations in the study area. The baseline air quality levels are within the National Standards prescribed for industrial and residential area.

Ambient noise levels were also measured at nine locations in the study area. Day time equivalent noise level in the study area varied between 46.2 to 58.7 dB(A) whereas the corresponding night time equivalent noise level ranged between 41.2 to 46.5 dB(A). The maximum of 58.7 dB(A) noise level was observed at the station no N2 the ML area. And the minimum of 41.2 dB(A) noise level was observed at the station no.N8 at Pirhea Pokhari .Thus the baseline noise levels are well within the National Standards (75 dB(A) during day time around mining area & 55 dB(A) during day time in residential area and 70 dB(A) during night time in mining areas & 45 dB(A) in residential area during night time).

Four numbers of surface water samples and Six numbers of groundwater samples were collected from the study area for analysis and obtaining present water quality. The water quality is within the permissible limit. No metallic or bacterial contamination was found in the groundwater samples.

Six soil samples were collected from the study area and analyzed. Type of soil available in the project area is mostly fine-loamy / typic ustochrepts in the core area / lease area and its immediate vicinity where as loamy-skeletal type soil in most of the buffer area i.e. within 10 kilometers radius from the boundary of the lease / core area.

Location of those sampling points are shown in **Map No. – 01**

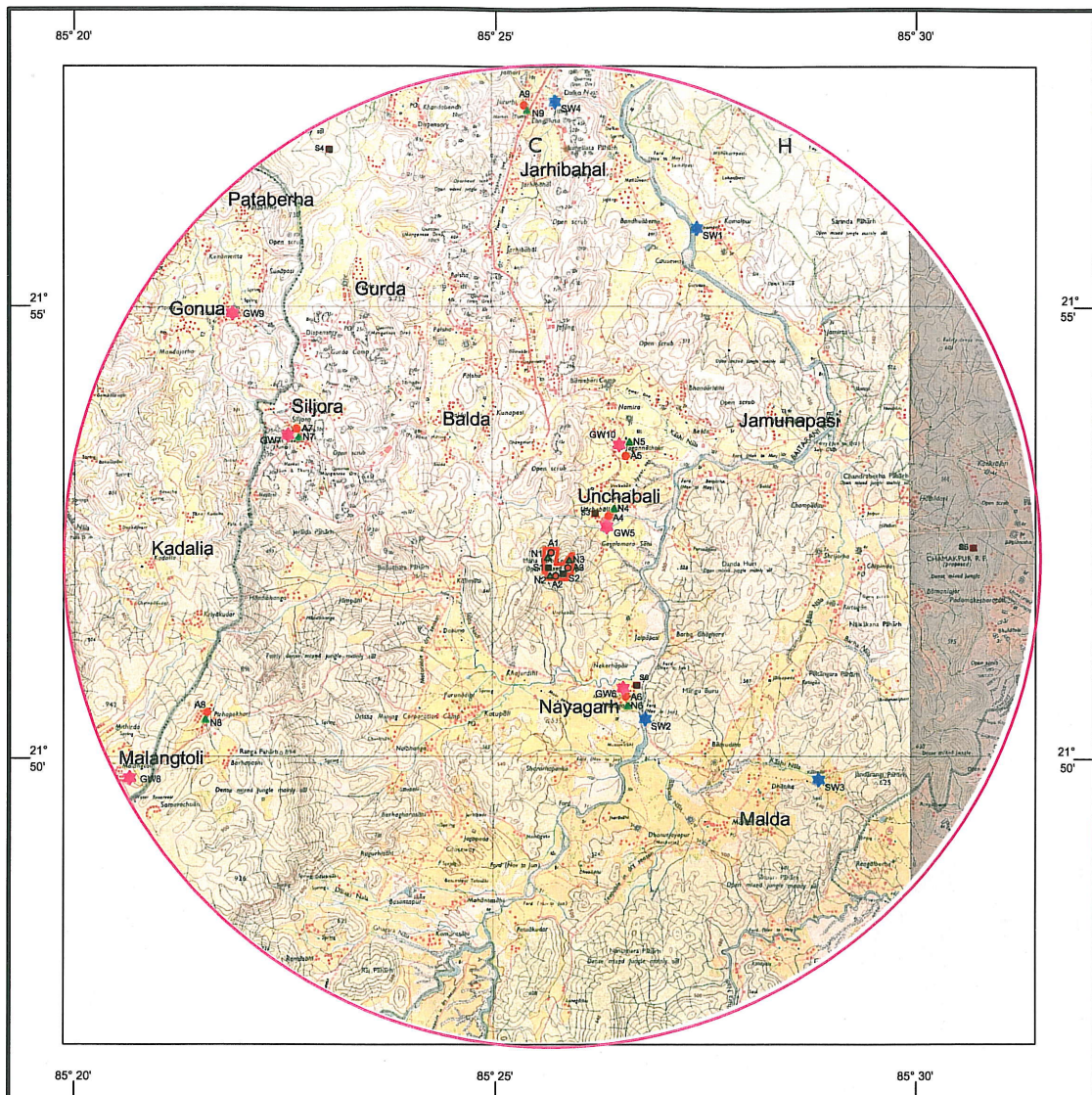
The total geographical area of Keonjhar District is 8303 Sq. K.M. Keonjhar District has a forest cover of 3225 Sq. K.M which is 38.84 % of the geographical area and comprises of two forest divisions i.e. Keonjhar (T) forest division and Keonjhar (WL) Division. Out of this moderately dense forest constitute 1,710 Sq. K.M. (Canopy density 0.40 & above) and open forest cover of 1,515 Sq.K.M. (Canopy density 0.10 to 0.40). This is as per information furnished in State of India's Forest Report, 2005 prepared by Forest Survey of India, Dehradun. Champion & Seth has classified the forests of this region in northern part of Keonjhar Division in to two major groups according to 'Forest Types of India' as defined.

- a) Group 3C – Northern Tropical Moist Deciduous Forests
- b) Group 5 B – Northern Tropical Dry Deciduous Forests.


Of-course variations do occur due to reasons like climatic, edaphic and biotic factors. Microclimate also influences the Forest Types. Bamboo is totally absent in this locality. Taking all these into consideration the vegetation has further been classified into three sub-types:

- i) 3C / C2 e Moist Peninsular Valley Sal.
- ii) 5B / C1c Dry Peninsular Sal Forests.
- iii) 5B / C2 Northern Dry Mixed Deciduous forest.






Map No. – 01 (Location of Sampling Points)



LEGEND

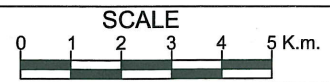
 M.L. AREA

SAMPLE MONITORING STATIONS

-  AAQ MONITORING STATIONS
-  NOISE MONITORING STATIONS
-  SOIL MONITORING STATIONS
-  SURFACE WATER MONITORING STATIONS
-  GROUND WATER MONITORING STATIONS

LOCATION OF SAMPLE MONITORING STATIONS.

REFERENCE
SOI Toposheet No-73G/5 & 73G/9



PROJECT
UNCHABALI IRON & MANGANESE ORE MINES
OF SMT. INDRANI PATNAIK
IN KEONJHAR DISTRICT, ORISSA.

BY
ENVIRONMENTAL RESEARCH AND
SERVICES (INDIA) PVT. LTD.
BHUBANESWAR.

However, Mahaparbat D.P.F. (DLC land) in which this lease is located, has been included in Forest Type – 5B/C2 'Northern Dry Mixed Deciduous forest'. Total area of this lease is distributed over plains, valley, hills and ridges. Most of the forest blocks like Mahaparbat situated in the proximity of villages have degraded forest and adequate rooted wastes, capable of regenerating through protection, silvicultural intervention and soil and moisture conservation. The forests of adjoining area have been allotted to 'Rehabilitation Working Circle' in the latest Working Plan of Keonjhar Division i.e. 2007-08 to 2017-18. The geological formation of this block is quite suitable for the growth of Sal, which therefore is the dominant species. It is more aggressive than any of its associates and constitutes 10 to 20 % of the crop composition. There is hardly any middle storey or top storey in the crop. The crop is the secondary growth and mostly constitutes the coppiced Sal. The crop still has the vigor to grow but need protection from biotic interference. The quality of Sal varies from all India quality III to IV. The principal associates are *Terminalia alata* (Asan), *Terminalia belerica* (Bahada), *Lagerstroemia parviflora* (Sidha), *Anogeissus latifolia* (Dhaura), *Syzygium cuminii* (Jamun), *Mangifera indica* (Mango), *Schleichera oleosa* (Kusum), *Lannea coromandelica*, *Oroxylon indicum* etc. *The most striking features are the presence of climbers like Milletia auriculata, Combretum decandrum (Atundi) etc.* These climbers have infested in such a way that, the growth of the vegetation at most of the areas have been restricted and need cleaning. This Sal forest is considered to be an extension of the excellent Sal forests of Singhbhum.

A total of 40 plant species consisting of 29 Trees species, 2 Grasses, 5 shrub species, 4 climber species were found from the surveyed area in both core and buffer zone.

There are no Sanctuaries, National Parks, Tiger Reserve or Biosphere Reserve exist within 10 Km of radius from Mining lease area. Karo Karampada Elephant Corridor is beyond 10 kms from the said project.

As the demographic features of the study area are almost similar to the district phenomenon, therefore, as per the 2001 census, Keonjhar district's demographic information are : Rural Population - 348577, Urban Population - 212944, Male- 789826, Female - 771695, SC -181488, ST- 695141, Other cast- 684892 and Total Population – 15,61,521.

3. ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

Air Environment

Impact: Mining activities like drilling, blasting, loading, unloading, crushing & screening and transportation shall generate airborne fugitive dust and other gaseous emission in the form of sulphur dioxide and nitrogen oxide. Gaseous emission shall be very minimal due to the consumption of very less amount of HSD and limited blasting area. Dust shall be the major air pollutant in this mine.

Mitigation measures: Control of fugitive emissions shall be achieved by adopting best environmental management practices like using dust collectors in drill machine, water sprinkling on haul road and dumping areas, avoiding over loading of trucks, controlled blasting technique, green belt development around the mining area and suitable pollution control equipment in the crushing plant. Development of green belt intermixed with dust filtering trees would also reduce dust pollution.

Noise, Vibration & Transport Infrastructure

Impact: Present noise levels in study area are far below the standards. There would be truck transport for transporting ore, so the increase in noise due to truck transport would increase the noise level. Work zone noise levels in the mining area are also expected to increase due to drilling, excavation, transportation and ore handling and crushing operations. The problem of ground vibration is associated with operations like drilling, blasting, loading, crushing and that of running machineries. But the most prominent one are the factors associated with blasting operations. Traffic load on the transportation road shall be increase due to the increase in production level.

Mitigation measures: Procurement of less noise generating machines/vehicles, maintenance of machines/requirements/vehicles in good condition, ear muffs or other protecting device or sound proof cabins to employees near noise generating source, adoption of scientific blasting method, development of green belt as noise barriers are the different ways to reduce noise pollution. State Govt. has initiated steps to improve the road condition of NH 215 and NH 75 which will be the only transportation road used by the mine.

Water Environment

Impact: Presently surface and ground water quality is good except turbidity in some water samples due to natural land erosion process. Sources of water pollution would be from overburden dumps and stockpiling of ores during monsoon. However, implementation of EMP would help to reduce these sources of pollution.

Mitigation measures: Afforestation of degraded forestlands and construction of check dams across the original course of stream/nallals to restrict sediment transport to water bodies. Collection of runoff/leachate water from overburden dumps and stockpiles in sedimentation tank before disposal. Proper rainwater harvesting methods to supply water to mine lease area.

Land Environment

Impact: The land erosion from degraded forest areas and from mined out areas, overburden dumps, primary and secondary stockpile, road construction would be

responsible for land degradation and water pollution. Environmental Management Plan is suggested to control the transport of sediments in run-off water-to-water bodies.

Mitigation measures: Overburdens should be stacked on non-mineralised area as per standard guidelines with retaining walls and arrangement for collecting and treating leachate water. The mined out area and overburden dumps should be stabilized by plantations using scientific horticultural methods.

Biological Environment

Impact: Clearing of forest shall have impact on the biological environment of the region. Mining activity, blasting on hilltop may produce noise and dust which may scare away wildlife in surrounding area.

Mitigation measures:

- Compensatory afforestation with local tree species and protection of afforested area
- Green belt development in mine lease area, around overburden dumps and stock piles and proposed township area
- Control of air pollution (dust) and noise pollution by EMP given in the report Socio-Economic Environment
- The positive impacts would be production of iron ore necessary for development of the state, creation of direct and indirect employment to local people, improvement of Infrastructural facilities and improvement in quality of life
- The negative impacts are of small nature and would be marginal increase in water and air pollution, though within stipulated limits, disturbance of tribal cultural identity due to possible influx of people.
- Improvement in primary and secondary employment opportunities to local people to reduce their dependence on the forest.
- Betterment of Infrastructural facilities and cultural environment to raise the Quality of Life.
- Social welfare activities need to be carried out by the project Authority.

4. ENVIRONMENTAL MONITORING PROGRAMME

The mine owner would prefer to have a well organized environment management and monitoring system to ensure compliance of all statutory obligations from time to time. The system ensure discharge of the following functions.

Regular Monitoring of Required Environmental Parameters

- Prepare annual Environment Audit Statement for the benefit of the Lessee at the corporate level and also as a part of requirement under the Environment Audit Statement Rules notified by MoEF.
- Advise the management for continual improvement of the status of the environment.
- Liaison with State Pollution Control Board, Department of Forests and Environment and other Government agencies for uninterrupted compliance of all rules and regulations.
- Creation of awareness among the project affected personnel (PAPs) and the general public in the area.
- Periodical training of management staff as well as technical and non-technical sub-floor staff, through training courses, workshops and seminars.

5. ADDITIONAL STUDIES

Risk Assessment & Disaster Management Plan :

The most important natural disaster to happen in mining area is flooding due to heavy rain and inadequate storm water or surface runoff management. Some times such situation may lead to flooding of quarry benches and in turns led to electrical malfunctioning. To attain to such situation and to avoid such incidents the said mining company has an adequate storm water management plan with suitable garland drain having intermittent bunds throughout the garland drain. For implementation of the said plan the company has a well designed and defined action plan which is being executed by the following designated personnel.

Key persons have been identified as site controller, Incident controller, Liaison Officer and Team Leaders. The team will be Fire fighting team, Security team, safety team, Transport team and evacuating team. Emergency control room is to be set up at a convenient location.

On the offsite emergency situations, Deojhar Iron Ore Mines of M/s Tarini Minerals (P) Ltd. has been suggested to cater with adequate necessary helps to protect its neighbors and provide basic amenities in case required.

6. PROJECT BENEFITS

The proposed project has lots of benefits both direct and indirect. These are generation of Employment, Infrastructure Development, Improvement of Educational Facilities in the Surrounding Area, Increase in General Awareness of the People, Increase in Competitive Spirit Among Youths, Improvement of the General Living Standard of the People in the Vicinity, Over all Improvement in Human Development Index, Growth of Allied Industries in the Area, Outflow

of local people will reduce and at the same time Inflow from outside will increase. Per Capita Income will improve. It will reduce Public Expenditure of Government on social Consumption Need. It will add to Government Exchequers in the form of various taxes and returns.

7. ENVIRONMENTAL MANAGEMENT PLAN

Environment Management Plan (EMP) is required to be implemented by the plant management in order to achieve better environmental viability of the project. The EMP will establish a framework for the effective management of environmental impacts and ensure the best overall protection of the environment through appropriate management procedures. Rs. 27.00 lacs have been earmarked as capital cost of pollution control systems. The EMP will ensure that all air pollution control devices, effluent treatment plants and water re-circulating and reuse schemes are functioning effectively. They will also supervise and monitor the handling, transport and disposal of solid wastes, spent oil and lubricants as per the approved authorization.

33 % of the total ML area will be converted into Greenbelt and greenery development inside and outside the ML area.

For Free health check up of the workers is being organized by the lessee. The workers will continue to be periodically checked for any clinical complaints and abnormal symptoms by the in-house dispensary. Safety department undertakes full review of the potential hazard scenarios during the mining. The review confirms the proposed safeguards for accident prevention and minimization and updates the assessment of consequences.

With the effective implementation of mitigation measures and Environmental Management Plan during detailed design, construction planning, construction and operation the project will create minimum adverse impacts that will be manageable.

Proposed peripheral development activities are tabulated below in **Table No. – 06.**

Table No – 06
Development activities in the Surrounding Villages

S.No	Description	Amount (Rs in Lakhs)	Time Frame
01	Construction and operation of Dispensary with Doctor and Supporting staff round the clock	20.00	6 months
02	Construction of overhead water tank for the surrounding villages	5.00	1 year
03	Financing for transport business to locals under the self employment scheme	100.00	1 year
04	Repairing & Maintenance of village roads	40.00	1 year
04	Total	165.00	1 year