

PREFEASIBILITY REPORT

FOR

EXPANSION OF IRON ORE PRODUCTION FROM 0.72

MTPA TO 1.5 MTPA FROM BADAMPAHAR IRON MORE

MINE

OF

M/S LALTRADES & AGENCIES PVT. LTD.

Prepared By



VISIONTEK CONSULTANCY SERVICES PVT. LTD

(An Enviro Engineering Consulting Cell)

NABET/EIA/RA039/063, Dated 11.05.2015

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**ISO 14001:2004
ISO 9001:2008
OHSAS 18001:2007**

CHAPTER – 1 EXECUTIVE SUMMARY

Sl.no	Project	:	Badampahar Iron Ore Mine
1	Name of Company/Mine Owner	:	M/s Lal Trades & Agencies (P) Ltd
2	Location		
	Forest Division	:	Rairangpur, Forest Division, Mayurbhanj district
	Village	:	Dhangrimuta, Dudhijharan & Badampahar RF
	Tehsil	:	Kusumi, Badampahar
	District	:	Mayurbhanj
	State	:	Odisha
3	Mining lease Area & Type of Land		129.61 ha Broken up Forest land prior to 1980 is 117.84 ha. for which Forest clearance has been obtained vide letter no.F.No-8-11/2004-FC dated 14.06.2007 & 27.07.2009 Non-forest land (Gharabari) - 0.78 ha Safety zone area 10.99 ha.
4	Geographical Co-ordinates		Topo Sheet : 73 J/4 Latitude : 22 ⁰ 03' 52.87" to 22 ⁰ 05' 9.53" N Longitude : 86 ⁰ 06' 33.81" to 86 ⁰ 08' 24.81" E
5	Name of Rivers/Nallahs/Tanks/Springs/Lakes etc		Kukudajharan Nala -5.5km E Kadkai River - 6.0km SE Jalpa Nadi – 7km W
6	Name of Reserve Forest(s), Wildlife Sanctuary/National Parks etc.		Similipal RF – 7.68 km (SE) Wildlife Sanctuary/National Parks within 10 km Kherna RF- 6.5 NW
7	Topography of ML Area		Elevation: 395-830 AMSL
8	Name of Mineral to be mined		Iron Ore

9	Rate of Production (in MTPA)	1.5 MTPA of Iron Ore																
10	Life of mine	11 Years																
11	Mineral Reserve in Million Tonnes	Total Reserve 18.460 million tone																
12	Drilling/Blasting	Drilling and blasting are practiced occasionally for loosening of hard strata.																
13	Ultimate depth of Mining	48m (up to 425 mRL)																
14	Regional water table	45-90m below ground level																
15	Water Requirement & Source	<p>Water required for domestic purpose, plantation and sprinkling for dust suppression only. Total water requirement including expansion will be 132 m³/day. m³/day</p> <table border="1"> <thead> <tr> <th>Particulars</th> <th>Existing</th> <th>Additional</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>Domestic</td> <td>15</td> <td>5</td> <td>20</td> </tr> <tr> <td>Industrial</td> <td>60</td> <td>52</td> <td>112</td> </tr> <tr> <td>Total</td> <td>75</td> <td>57</td> <td>132</td> </tr> </tbody> </table> <p>Drinking Source : Overhead tank having capacity 30 KL has been constructed for supply of drinking water .The water will be drawn from ground for which permission has been obtained from CGWB vide letter no.21-4(193)/CGWA/SER2009-1200 dated 8.12.2009</p>	Particulars	Existing	Additional	Total	Domestic	15	5	20	Industrial	60	52	112	Total	75	57	132
Particulars	Existing	Additional	Total															
Domestic	15	5	20															
Industrial	60	52	112															
Total	75	57	132															
16	IBM Approval date	The scheme of mining has been approved vide letter no. MS/OTFM/53-ORI/BHU/2014-15 dated.27.3.2015																
17	Public hearing date	Public hearing will be held after preparation of draft EIA & EMP report.																
18	Cost of project (Rs.)	35.5 crores																
19	Any other (Specify)	None																

Badampahar Iron Ore Mines is the oldest mines in Asia and its deposit was first reported by P.N. Bose in the year 1904 & the mining lease over an area of 1063.61 ha. was obtained on 4th August 1919 by ex lessee M/s Tisco Ltd. After 55 years of extensive working over the same area by ex lessee M/s Tisco Ltd surrendered the lease and the same lease was granted on 12.9.1969 & executed on 27.5.1970 for 30 years in favour of Sri S. Lal . The same lease was transferred to the present lessee M/s Lal Trades & Agencies (P) Ltd in the year 1971 & the present lessee started its mining operation over 129.61 ha surrendering 934 ha(619.67 ha + 314.33 ha)

The state govt. have been pleased to extend the validity period of Mining lease over the same area under section 8AMMDR Act,1957 as amended by the MMDR Amendment Act,2015 till 26.5.2020 (i.e 50 years from 27.5.1970) vide letter no. 5615/SM Bhubaneswar dated 5.7.2016.

As this project is near about 100 years old most of the local villages are directly & indirectly related to this for their lively hood. It is having a great economical importance for the local tribal village people because there is no other means of lively hood except seasonal agriculture . This project is working by engaging 1300 of local workers .

The Lessee has already obtained environmental Clearance on 9th April 2010 for produce 7,20,000 TPA of Iron Ore from the Mines. Now, cut off grade is considered as 45% Fe, where as in the year 2009-10 cut of grade was 58% Fe. Looking on the marketing demand of low grade iron ore (+45% Fe to -58% Fe), Lessee again intents to enhance his production to 1.5 MTPA.

As on 31.3.2017, the reserve is 16.72 MT. Mining will be done by opencast Semi-mechanized method. Height and width will be kept at 6m and 15m respectively. The individual bench face will be kept vertical (85°) and the overall slope angle is proposed to be maintained at 22° with horizontal. Considering the cost of the project, cost of production, sale value of Iron ore, expenditure towards peripheral development etc. the project is viable .

CHAPTER – 2

INTRODUCTION OF THE PROJECT & BACKGROUND INFORMATION

(i) Identification of project and project proponent.

Badampahar Iron Ore Mines:

Badampahar Iron Ore Mines is the oldest mines in Asia and its deposit was first reported by P.N. Bose in the year 1904 & the mining lease over an area of 1063.61 ha. was obtained on 4th August 1919 by ex lessee M/s Tisco Ltd. After 55 years of extensive working ex lessee surrendered the lease and the same lease was granted on 12.9.1969 & executed on 27.5.1970 for 30 years in favour of Sri S. Lal . The same lease was transferred to the present lessee M/s Lal Trades & Agencies (P) Ltd in the year 1971. The present lessee retained the balance area 129.61 ha.

The state have been pleased to extend the validity period of Mining lease over the same area under section 8AMMDR Act,1957 as amended by the MMDR Amendment Act,2015 till 26.5.2020 (i.e 50 years from 27.5.1970) vide letter no. 5615/SM Bhubaneswar dated 5.7.2016.

As this project is near about 100 years old most of the local villages are directly & indirectly related to this for their lively hood. It is having a great economical importance for the local tribal village people because there is no other means of lively hood except seasonal agriculture . This project is working by engaging 1300 of local workers since 1970.

Supplementary mining Lease deed is attached as **Annexure –1**.

Forest Clearance has already been obtained for the broken up forest land of 117.84 ha (**Copy attached as Annexure - 2**).

The latest Scheme of Mining prepared for a period of 5 years (2015-16 to 2019-20) under Rule 23 B (2) of MCDR, 1988 and approved vide letter no MS/OTFM/53-ORI/BHU/2014-15 on dard 27.03.2015. Approval of Mining Scheme attached as **Annexure – 3**.

M/s Lal Trade & Agencies (P) Limited

This is a private limited firm having its registered office at 7, Waterloo Street, Kolkata, West Bengal – 700069. Sri Raj Kumar Misra has been nominated as Owner of the Mines by the Board of Directors of the Company and he is authorized to be in-charge of the mining activities of the Company and to do all such acts necessary for the purpose. He is economically sound and having vast experience in mining sector.

(ii) Brief description of nature of the project.

This is an expansion project for mining of Iron Ore. The production capacity of Badampahar Iron ore mine is enhanced from 7,20,000 TPA to 1.5 MTPA. At present, the mining operation is being done by open-cast semi-mechanized method and it is proposed to adopt the same method during this scheme period.

(iii) Need for the project and its importance to the country and or region

The most important and common use of Iron ore is in the Steel making Industries. Steel plants are the backbone of any country's development, especially for a developing country like India as it is important for all infrastructure development in the country; its utilisation needs to be optimized. Iron & steel industries are normally heavy industries & they need massive amount of raw material. Iron ore is the principal raw material along with cooking coal and limestone. As per estimation, currently steel production in the country is gradually growing up.

This mines is situated in the district of Mayurbhanj i.e Bamanghati subdivision where tribal population is more than 80%. The climatic condition & soil is not so suitable for agriculture. There is no source of engagement for this tribal people and their living condition is very poor. Some times they go out side in search of work to support their family. There is only mining activities in this reason & no industries/plants to provide source of income to the local people. They purely depend on the mining activities only to maintain their lively hood.

This has necessitated the production of raw materials to cater the demand and also these value added product will fetch more revenue to the state as well as to the country as a whole.

(iv) Demand-Supply Gap

The estimated production in the country is not matching with the demand of the growing Industries. This clearly shows the gap between the demand and supply of basic raw materials. To minimize this gap, lessee has initiated a step to enhance the production of this mineral.

(v) Imports vs. Indigenous production

Development and industrial growth of a country depends to a great extent on the availability of economic minerals. The Iron ore, one such economic mineral are plentifully availability in Jharkhand, Chattishgarh & Odisha. The Badampahar Iron ore deposit comes under the state of Odisha and being exploited economically by a number of organizations. The Iron ores produced from the area observed to be of High Quality and thus favorably cater to the needs of different Steel & Ferro Alloys industries. As far as Iron ore production is concerned with reference to the Importing of the said ore, it is advantageous to mine the mineral rather than importing the same.

(vi) Export Possibility

Only high grade fines (-10 mm) will be exported.

(vii) Domestic/ export Markets

Grade of iron ore in Badampahar Mine varies from 45.13% Fe to 60% Fe. These ores are sold in four grades in the domestic market as per the Govt. norms such as +58%-60% Fe, +55%-58% Fe and +50%-55% Fe mainly for steel making. High grade Fines (-10mm) are exported. Low grade fines are being dispatched to the Lessee's beneficiation plants located at Tirilidihi village area at a distance of 3 km from the M.L area for up-gradation iron ore fines before its end use.

Employment Generation (Direct and Indirect) due to the project

The mining operation is carried out by open cast semi-mechanical method. Buffer zone of the applied RML area is dominated by the ST population. Literacy level is poor. Therefore, 80% of the employment is kept under un-skilled category. They have been employed for

wagon loading, manual breaking, digging, sorting, sizing, road construction & maintenance etc. Though machines are deployed for the above works, local people are employed as a part of socio-economic improvement program. As this project is near about 100 years old most of the local villages are directly & indirectly related to this for their lively hood. It is having a great economical importance for the local tribal village people because there is no other means of lively hood except seasonal agriculture . This project is working by engaging 1300 of local workers .In addition to direct employment, this project providing 3 lakhs man days per annum.

Keeping in view the production enhancement, lessee has proposed to employ 500 workers exclusively for wagon loading.

CHAPTER – 3

PROJECT DESCRIPTION

(i) Type of project including interlinked and interdependent projects, if any.

The Badampahar Iron Ore Mine is a mine for exploitation of Iron Ore. The method of mining will be open cast Semi-mechanized. The targeted production will be 1.5 MTPA. This is not linked or dependant on any other project so far, as the production of iron ore is concerned.

(ii) Location (map showing general location, specific location, and project boundary & project site layout) with coordinates.

Badampahar Iron Ore Mine is coming within the Survey of India toposheet No: 73-J/4. It is bounded by Latitude: 22° 03' 52.87" to 22° 05' 9.53" N Longitude: 86° 06' 33.81" to 86° 08' 24.81" E. The area falls in the Village- Dangrimuta and Badampahar RF, Thana – Badampahar, in the district of Mayurbhanj of Odisha State. The Lease area is easily accessible from Badampahar through 1 Km well maintained road. Badampahar is the nearest Railway Station. Rairangpur is the nearest major town situated at a distance of 29Km and Baripada is the district-headquarter at a distance of 110 Km from the mines.

Topographical **Location Map attached as Plate -1**.and satellite image **attached as Plate-2**

(iii) Details of alternate sites considered and the basis of selecting the proposed site, Particularly the environmental considerations gone into should be highlighted.

Being a mining project it is site specific. No alternate site can be worked out. It has to be carried out within lease area allotted by the State Government. As far as the environmental considerations, the lessee is abiding by all relevant acts & rule and provisions of EP Act. All precaution measures will be taken within the 10 km radius of the area for environmental management.

(iv) Size or magnitude of operation

Total lease area is 129.61 ha (Forest area -117.84 ha, Safety zone -10.99 ha & Non-forest area - 0.78 ha). As per EIA notification 2006, it is coming under “Category A” mines. It is proposed to produce ~ 1.5 million TPA Iron Ore from these mines.

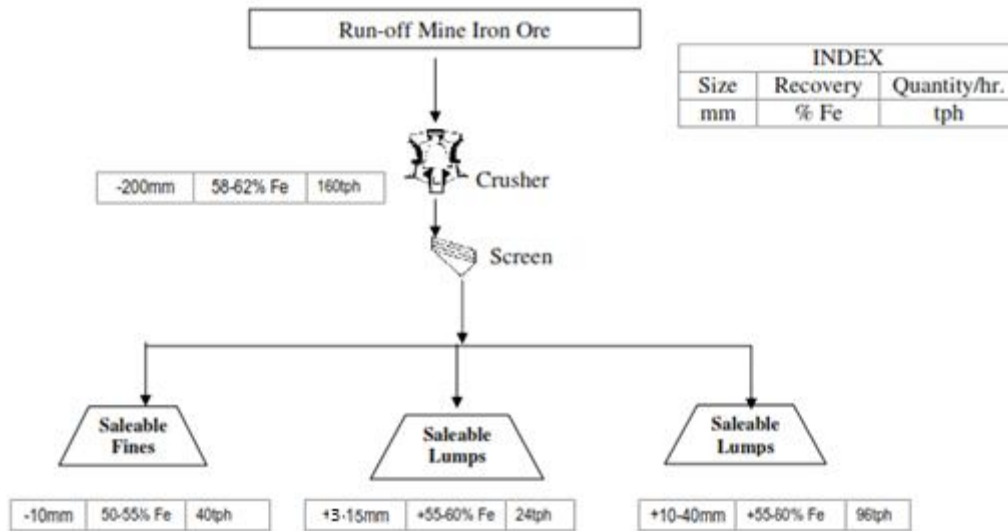
(v) Project description with process details (a schematic diagram/flow chart showing the project layout, components of the project etc. should be given)

The various mining operations such as drilling, blasting, excavation, loading, sizing and transportation will be practiced in opencast semi-mechanised mining. Height and width of the benches will be kept at 6m and 15m respectively. The individual bench faces will be kept nearly vertical (85°) whereas the overall quarry slope angle (the angle between the line joining the toe of bottom bench and the crest of the top bench with the horizontal) is proposed to be kept around 22° with the horizontal.

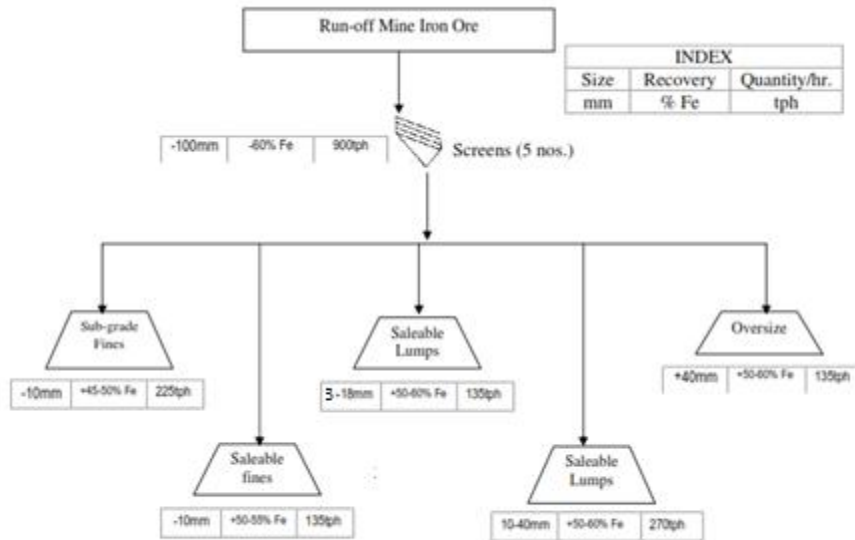
Due to soft nature of strata, rock breakers are deployed for loosening of the working faces. Drilling and blasting are practiced occasionally for loosening of hard strata. Loosened ROM ore is excavated and loaded by the excavators into the tippers which carries the ROM ore for feeding of crusher / screens. Oversized screened materials are broken manually with the help of hammers. After sizing manually as well as mechanically in the crushing and screening units, saleable iron ore is dispatched to the various destinations as per the demand or purchase order.

Minerals Processing:

One mobile crushing having -200mm feed size has been commissioned where run-off mine ore is crushed in to two types of lumps +3-15mm and +10-40mm and -10mm as fines. Flow sheet of the crushing unit furnished as follows:



Total 5 nos. of screening unit (two fixed screen of 100tph and three mobile screens of 200tph – 350tph) have been deployed for sizing of ROM ore into the lumps of +40mm & +10-40mm and sub-grade ore fines of -10mm. Flow sheet of the screening unit furnished as follows:



Mine development:

Active quarries such as Bapet, Narvane, Peak and Q-4 will be developed during this scheme period. Peak-A, Peak-B, Quarry-4 and Narvane will be worked as a single quarry while Bapet will be operated separately. Keeping in view the mine closure aspects, the aforesaid quarries are selected to continue the operation till exhaust. Champajharan-A & B will be developed & exhausted in 1st year and back-filled in 2nd year. Overall progress in mining will be towards the rise side of the hill.

The year-wise quantum of development, production of Iron ore, generation of waste and sub-grade for the scheme period is given below:

Year	Name of Quarry	Waste (t)	ROM Ore (t)	Sub-grade Ore (t)	Saleable Ore (t)
1 st (2015-16)	Narvane	27144	66456	16848	49608
	Peak-B	41621	101899	25834	76065
	Peak-A & Q-4	212628	520572	131976	388596
	Champajharan A & B	144165	352955	89481	263474
	Sub-total	425,558	1,041,882	264,139	777,743
2 nd (2016-17)	Narvane	81658	199922	50685	149237
	Peak-B	29632	72548	18393	54155
	Peak-A & Q-4	365765	895495	227026	668469
	Sub-total	477,055	1,167,965	296,104	871,861
3 rd (2017-18)	Narvane	67483	165217	41886	123331
	Peak-B	22695	55565	14087	41478
	Peak-A & Q-4	382806	937213	237603	699610
	Bapet	55946	136974	34726	102248
	Sub-total	528,930	1,294,969	328,302	966,667

4 th (2018-19)	Narvane	19453	47627	12075	35552
	Peak-B	105107	257332	65239	192093
	Peak-A & Q-4	355887	871312	220896	650416
	Bapet	88972	217828	55224	162604
	Sub-total	569,419	1,394,099	353,434	1,040,665
5 th (2019-20)	Narvane	27445	67195	17036	50159
	Peak-B	142657	349263	88545	260718
	Peak-A & Q-4	315021	771258	195530	575728
	Bapet	113929	278931	70715	208216
	Sub-total	599,052	1,466,647	371,826	1,094,821
Total	---	2,600,014	6,365,562	1,613,805	4,751,757

(vi) Raw material required along with estimated quantity, likely source, marketing area of final product/s, mode of transport of raw Material and Finished Product.

Mining project raw material is not required. Here the Iron Ore produced from the mine is the raw material for other industries. The Iron ore produced from the mines is being transported by Rail/Road to consuming industries such as Ankit Metal & Power limited, Mark Steels limited, Raipur Power & Steel limited and Loyd Metal and Energy Limited. Low grade fines are being dispatched to the Lessee's beneficiation plants located at Tirilidihi village area at a distance of 3 km from the M.L area for up-gradation iron ore fines before its end use.

Resource optimization / recycling and reuse envisaged in the project

As on 31.3.2017 an estimated minable reserve is 16.72 MT

(vii) Availability of water its source, Energy / power requirement and source

The ground water level of the area, observed from open wells, tube wells, nallas, nearby the mining lease hold area lies between 45m to 90m. Water required for domestic purpose, will be sourced from ground water, i.e., existing dug well from nearby village.

Water required for domestic purpose, plantation and sprinkling for dust suppression only. Total water requirement including expansion will be 132 m³/day.

Particulars	m ³ /day		
	Existing	Additional	Total
Domestic	15	5	20
Industrial	60	52	112
Total	75	57	132

Drinking Source : Overhead tank having capacity 30 KL has been constructed for supply of drinking water .The water will be drawn from ground for which permission has been obtained from CGWB vide letter no.21-4(193)/CGWA/SER2009-1200 dated 8.12.2009

Power/Energy :

Fuel (Diesel) would be used for operating equipments and vehicles

4Nos DG During operation

1X15KVA

2x25 KVA.

1X160 KVA

1X250 KVA

Electricity from Grid @ 167 KW / month will be consumed for office purpose.

(viii) Quantity of wastes to be generated (liquid and solid) and scheme for their Management/disposal.

Total 2, 600, 014 t of waste will be generated during this Scheme period. Which will be dumped existing six number of dumps namely D-1, D-2, D-3, D-4, D-4A and D-5 in the rehabilitated lease area over 6.25 hectares. Out of these, dump slopes of D-2, D-3 and D-4 are stabilized by way of plantation of saplings like simarua, chakunda, accasia, sishoo, karanj etc. Cumulatively, 670 m long retaining wall and 670 m long garland drain have been developed around the waste dump. In addition to this, 3 settling tanks are developed in the M.L. area at strategic points to receive surface run-off water, settle the sediments and release clean water. Keeping in view, mined out area of Champajharan group of quarries is selected for reclamation by way of back-filling & plantation. In addition to this, existing dumps namely D-1, 2, 3, 4, 4A & 5 as well as a new dump namely Dump-6 are selected for dumping of waste materials.

Proposal for Stabilization of dump:

- a) The area earmarked for dumping is devoid of any natural water course.
- b) To check surface wash-off during the rainy season, it is proposed to erect toe wall around the foot of the dump.
- c) A garland drain shall be provided all around the dump with some soak pits to arrest solid wastes. The garland drain will help in gravitational settling of the solid waste and clean water will pass downwards to a settling tank.
- d) For the stability of dump, the slope of the dump shall be maintained at 28°. Further, the slope of the dump shall be stabilized by plantation and grass.

CHAPTER – 4 SITE ANALYSIS

(i) General

Badampahar Iron ore Mines over an area of 129.61 hectares situated in village Dhangrimuta and Badampahar R.F. under Kusumi Tehsil in the district of Mayurbhanj of Odisha State. And it is located in survey of India Topo Sheet No. 73 J / 4. Limited by the Co-ordinates:

Latitude: $22^{\circ}03'52.87''$ to $22^{\circ}05'9.53''$ N

Longitude: $86^{\circ}06'33.81''$ to $86^{\circ}08'24.81''$ E

(ii) Connectivity

The mine is well connected with Badampahar (a small mining township area) NH-6 is passing at a distance of 5.3 Km from the mine. Nearest Railway Station located at Badampahar, which connect Jamshedpur at a distance of 90 Km. Rairangpur is the major town of the area at 29 km, where full-fledged Market facilities are available. Baripada is the districts headquarter situated at 110 Km from the mines. Nearest Airport located at Ranchi, about 160 Km away from the mines.

Location map of the ML area is attached.

(iii) Land Form, Land use and Land ownership.

The area bears undulated hilly topography. The mining lease hold area over 129.61 hectares contains forest and private land situated in village Dhangrimuta and Badampahar Reserve Forest, in the district of Mayurbhanj of Odisha State. Land schedule (Lease deed) of the project area is attached as Annexure – I

(iv) Topography (along with map)

Badampahar iron ore mine is located on the south-western extremity of the hill range running from Gorumahisani to Badampahar.

The area is characterized by the valleys & hillocks. Highest and lowest altitudes are noted at 830m and 395m above mean sea level. The maximum altitude difference is noted to be 435m.

- (v) **Existing land use pattern (agriculture, non-agriculture, forest, water bodies (including area under CRZ)), shortest distances from the periphery of the project to periphery of the forests, national park, wild life sanctuary, eco sensitive areas, water bodies (distance from the HFL of the river), CRZ. In case of notified industrial area, a copy of the Gazette notification should be given.**

This mining lease area over 129.61 ha is confined with 117.84 ha broken up forest land and 0.78 ha private land (gharbari) & 10.99 ha is safety zone. The details of which has given in the land schedule. The entire lease area falls under Villages Dhungrimuta and Badampahar Reserve Forest in the district of Mayurbhanj of Odisha State. Kadkai river which constitutes the main drainage area, flows at an aerial distance of 6.8 km in east of the mines. There is a Similipal Tiger Reserve (National Park) situated within 10 Km radius of the lease area for which lessee has obtained NBW clearance.

Existing Infrastructure.

Administrative facilities: An office building is available with adequate rooms for mines manager & associated staff. Electricity & telephone facilities have been provided in the office. A store room and garage are attached for further facilities.

Statutory Facilities: Rest shelters have been made near the quarries for the workers to take rest while tired during the working hours and to take food & water. Cool & wholesome drinking water has been provided adequately in the rest shelter during the mine working hours.

Office compound houses a first-aid centre which is equipped with a stretcher, sterilized dressing materials such as cotton wool, bandages & adhesive plasters, tincher iodine & anticeptic solution, an eye bath, clinical thermometers, syringe and hot water arrangement. Canteen in the office compound provides food to the staff & officers whenever necessary.

- (vi) **Soil Classification.**

As no toxic substance will be generated or involved, the impact on soil quality is not likely to be more intensive than the existing level. However, the dust generated during operation of mining activity, loading and unloading and vehicular movements normally constitute heavier particles that would readily settle on very small areas within the lease area.

(vii) Climatic data from secondary sources.

The area experiences subtropical dry to wet climate. The hottest months are May and June when temperature remains around 44⁰ C. During December and January the minimum temperature remains around 9⁰ C. The area is devoid of large variability of temperature and free exposure. The normal rainfall at Mayurbhanj is about 1250 mm. On an average 80% of rainfall is received during the monsoon season (i.e. Mid-June to September). Wind direction and speed are most impact factors for the transportation of dusts. Relative humidity varies between 10 % to 96 %. Area remains calm for nearly 50% of the year. Predominant wind direction is SW.

(viii) Social Infrastructure available.

Accessibility: The lease area can be approached from Badampahar (a small mining township-cum-police station area) through 1km long well maintained road. Important towns like Rairangpur tehsil area (29km), Barbil municipality area-cum-mining town (115km), Baripada district Head Quarter (110km) and Bhubaneswar, State Capital (350km) in Odisha State and Jamshedpur Steel city & Chaibasa Regional Mine safety office in Jharkhanda State and Kolkata, nearest metro city & State Capital of West Bengal (310km).

Market facilities: Local market sits at Badampahar on Sunday. However, fully fledged market facilities are available at Rairangapur (29km) and Baripada (110km).

Electricity: Electricity has been made available in the M.L. area for office & quarters. Mine is operated manually. There is no proposal to use electricity during the modification period of 5 years.

Water availability: Drinking water is available from the 45m to 90m deep tube-wells which are maintained by the public health and engineering department at Badampahar.

Medical facilities: A State Govt. hospital with qualified doctor & paramedical staff is available at Badampahar to provide free medical facilities to the local people.

Education: Education up to college level is available at Badampahar. Engineering colleges are available at Rairangpur and Baripada (District Head Quarter).

Other facilities: Post, telegraph, telephone and bank facilities are available at Badampahar.

CHAPTER – 5 PLANNING BRIEF

(I) Planning Concept (type of industries, facilities, transportation etc.) Town and Country Planning/Development authority Classification.

The various mining operations such as drilling, blasting, excavation, loading, sizing and transportation will be affected by jack hammer drill associated with compatible size compressors. Power gel explosive in conjunction with safety fuse & ordinary / electric detonators are used for blasting to loosen hard rock mass for ease in excavation. Open cast semi-mechanized method of mining will be adopted. Height and width of the benches will be kept at 6 m and 15 m respectively. The individual bench faces will be kept nearly vertical (85°) whereas the overall quarry slope angle (the angle between the line joining the toe of bottom bench and the crest of the top bench with the horizontal) is proposed to be maintained at around 22° with the horizontal depending upon width of the benches.

(II) Population projection.

It has been proposed that the work will be carried out by OTFM method. It has been calculated that, about 736 nos. of employees are required. Hence, there will be an overall improvement of socio-economic status of the people of surrounding areas.

Administrative & supervisory personnel will be only 59 numbers which includes statutorily required personnel under MMR, 1961 & MCDR, 1988 as follows.

Sl. No.	Designation	Qualification / Experience	Numbers
1	Mines Manager	Degree in Mining Engineering with first class certificate of competency	1
2	Asst. Mines Manager	Degree in Mining Engineering with 2 nd class certificate of competency	2
3	Mining Engineer-in-charge	Degree in Mining Engineering having 15 years experience	1
4	Geologist	M. Sc in Applied Geology / Geology having more than 10 years experience	1

5	Mechanical Engineer	Degree/Diploma in Mechanical Engineering	3
6	Surveyor	Mine's surveyor's certificate of competency	1
7	Foreman	Foreman certificate of competency	4
8	Mining mate	Mate's certificate of competency	4
9	Mining mate (Blaster)	Mate-cum-blaster's certificate of competency	2
10	Office staff	---	40
Total	---	---	59

Workers (Skilled/Semi-Skilled/Un-Skilled)

Buffer zone of the applied RML area is dominated by the ST population. Literacy level is poor. Therefore, 80% of the employment is kept under un-skilled category. They will be employed for manual breaking, digging, sorting, sizing, road construction & maintenance etc. Though machines are deployed for the above works, local people are employed as a part of socio-economic improvement program.

Type	% Proposed	Numbers
Skilled	10%	73
Semi-skilled	10%	73
Un-skilled	80%	570
Total	100%	716

Total = Management & supervisory/Highly skilled (59) + skilled (73) + semi skilled (73) + un-skilled (570) = 775.

Keeping in view the production enhancement, Lessee has proposed to employ 500 workers for iron ore leasing.

(III) Land use planning (breakup along with green belt etc.)

The proposed land use pattern of the ML area.

SI	Type of land use	As at present (ha)	As at the end of Scheme period (ha)	As at the end of Conceptual period(ha)	
1	Area under excavation	39.15	46.064	87.331	
2	Storage for Topsoil	---	---	---	
3	Overburden dump	6.25	12.545	12.545	
4	Mineral storage	Ore	1.500	3.333	4.757
		Sub-grade	1.950	5.649	5.649
5	Infrastructure (workshop, rest shelter etc.	0.780	0.780	0.780	
6	Road	2.400	2.400	2.400	
7	Railways	---	---	---	
8	Tailing Pond	---	---	---	
9	Effluent Treatment Plant	---	---	---	
10	Mineral Separation Plant	5.000	5.000	4.156	
11	Township area	---	---	---	
12	Green belt	6.05	7.132	5.82	
13	Others (Magazine, Weigh bridge etc)	23.077	26.995	6.172	
	Total	86.157	109.898	129.610	

Afforestation and Reclamation / Rehabilitation: A total of 249690 saplings such as Mango, Neem, Mahaneem, Chakunda, Tamarind etc will be planted over an area of 99.876 hectares conceptually on behalf of the lessee in the lease area due to this ongoing mining project:

Sl. No.	Plantation Period	Area (in ha.)
1	Reclamation and Rehabilitation (soil conditioning & plantation) of mined out area.	87.331
2	Rehabilitation (soil conditioning and plantation) of waste dump	12.545
Total	---	99.876

Almost all the quarries have been developed on the hill peak and hill slopes. These mined out areas over 87.331 hectares will be reclaimed and rehabilitated through soil conditioning & plantation of local species as available nearby or as directed by the concerned Govt. authorities.

(IV) Assessment of Infrastructure Demand (Physical & Social)

All infrastructure facilities like rest shed, drinking water, and first-aid are available in the mine. Rest shed is proposed to be kept clean & tidy. Portable blasting shelters are proposed to be provided near the quarries.

A garage-cum-workshop is proposed to be provided with the arrangement for repair & maintenance, over hauling, fueling of the machines such as drills compressors, trucks / tippers etc. Fuel storage facilities are also proposed to be provided.

(V) Amenities/ Facilities

Helmets, safety shoes, ear plugs, spectacles, globes, pads etc will be provides for safety of the labour, while working. Rest shed will be provided to take rest in lunch period. Vocational training will be provided to the labours by trained executive to work safety in the mine & processing unit. First-aid as well as medical facilities will be made available in the mine or to

take care of the health. In addition to these, following amenities / facilities will be provided to the local communities:

- (a) Improvement in cultural status through vocational training and recreational facilities.
- (b) Co-operative and fair price shops.
- (c) Sports/ games.
- (d) Greening out side of the lease area.

CHAPTER – 6 PROPOSED INFRASTRUCTURE

(i) Mining Area (Processing Area)

During plan period, an area of 87.331 hectares will be required for excavation. At conceptual stage, 129.61 ha will be used for mining and allied activities.

(ii) Residential Area (Non Processing Area)

There will be no residential area inside the lease area. Since the lease area is near the village Badampahar, the infrastructural facilities in respect of road, market, telephone, power etc. are well developed.

Accommodation or Housing

As far as experience is concerned, local people will work in the mine staying in their own villages. Migrated people from distance will be accommodated at Badampahar and Rairangpur.

Rest shed & Fast-aid Facilities

The rest shed will be provided near quarry site as per the mines rule, 56. Toilet, Fast-Aid and lunch facilities will be attached with the rest-shed.

(iii) Green Belt

It is a mining project. A green belt is proposed along/inside the lease boundary to form a barrier mainly for dust flow control. During this scheme period, 13.182 ha of land will be used for plantation purposes along the lease boundary. 21000 nos. of saplings proposed to be planted.

(iv) Social Infrastructure

There is provision for develop the social infrastructure like employment of local people in the mines, provision of communicational, educational and medical facilities, sanitation, family planning, provision & supply of clean drinking water capacity building etc.

(v) Connectivity (Traffic and Transportation Road /Rail /Water ways etc.)

The mine is well connected with Badampahar by village road, with a distance of 1 km. The nearest railway station is Badampahar.

(vi) Water Quality Management

Surface Water: Seasonal nalas, Ponds and Kadkai River are the surface water sources in and around the area.

Ground Water: Drinking water source in the region are the tub wells and dug wells. For the mine employed people, drinking water is made available from the overhead tank. The depth of these tube wells varies from 150ft to 300ft (45m to 90m).

Air Quality Management

Due to good market demand for this quality Iron ore, production has been enhanced, which can be achieved by using excavator in combination of number of tippers. This may cause dust emission. However, the dust fall rate will be reduced by adopting regular water spraying on haul roads and by plantation in the area. It is proposed to carry out AAQ monitoring every yearly to know the AAQ of the area.

(vii) Waste Management

ROM Ore to waste ratio for the plan period is calculated to be 1: 0.408. On the basis of above ratio, conceptual generation of waste will be as follows:

Period	ROM Ore (t)	Waste (t)	Waste (m ³)
Plan period	6,365,562	2,600,014	1,083,339
Beyond	11,853,720	4,833,453	2,013,939
Total	18,219,282	7,433,467	3,097,278

Waste of plan period will be utilized for back-filing of Champajharan-A, B & C in plan period itself as well as dumped as per Para-7.1 and waste under generation beyond plan period will be utilized for back-filling of mined out area from 6th year (2020-21) and onwards.

As far as possible, waste material will be compacted and stabilized by dumping the various sized materials in a mixture form. There will be automatic compaction of waste materials during the movement of truck/tippers while dumping.

Garland drain will be developed around the dumped waste to divert the surface run-off water to prevent the washing of waste materials while there is rain. Grass will be sown over the dead dump to control erosion and dust generation. Finally, pot holes will be developed on the dump top and plantation will be undertaken.

Top-Soil Management

As mining will be done on hill slope, no top soil will be generated.

(viii) Disposal of Mining Machinery:

As most of the machineries are on hired, removal of machinery can be done any time as per requirement.

(ix) Safety and Security

At the time of final closure of the mines, all the abandoned pits shall be reclaimed and rehabilitated. Till such time, the area is handed over to the concerned owners; guards shall be engaged for security and safety.

(x) Disaster Management and Risk Assessment:

As far as the nature of deposit & method of mining is concerned, there is no possibility of landslides, subsidence, flood, fire and tailing dam failure.

Map of seismic zone in India indicates that Odisha falls under seismic zone-I, II & III. In Odisha, minor earth quakes have been felt many often but non was severe.

Employment potential for the area will be 775 numbers. Lessee may need the help of nearest state fire department located at Badampahar and Rairangpur for rescue if any high risk accident occurs in the area which will be sufficient for the above employment potential.

(xi) Care and maintenance during temporary discontinuance

An emergency plan for the situation of temporary discontinuance due to court order or due to statutory requirements or any other unforeseen circumstances may indicate

measures of care, maintenance and monitoring of status of discontinued mining operations expected to re-open in near future.

During the course of mining there may be temporary discontinuance due to unforeseen causes such as court order, statutory requirements, accidents, natural calamities or any other circumstances. Therefore, an emergency plan is necessary to reopen the mine which will include:

- Intimation to authorities concerned in the prescribed form for temporary discontinuance.
- Monitoring of status of unplanned discontinued mining operation in respect of bench height, width, individual bench slope angle, overall quarry slope angle, overhang, undercut, noise levels or any other parameters whose levels either in form of higher side or lower side is dangerous for further mine working.
- Preparation of plan & sections of discontinued mining operation.
- Projection of benches in plan & sections which is safe for further working.
- Formation of safe benches as per plan & sections.
- Management of misfire, maintenance of machinery etc. which is risk free and not dangerous for further working.
- Intimation to the concerned authorities for reopening once the mine is risk free.

(xii) Power Requirement & Supply / source.

Fuel (Diesel) would be used for operating equipments and heavy machinery.

CHAPTER – 7

REHABILITATION AND RESETTLEMENT(R & R) PLAN.

- (i) **Policy to be adopted (Central/State) in respect of the project affected persons including home oustees, land oustees and landless labourers (a brief outline to be given).**

There is no human settlement in the lease area which is located in Private land and forest land of 129.61 ha. Therefore, rehabilitation and resettlement proposal is not required.

CHAPTER – 8**PROJECT SCHEDULE & COST ESTIMATES****(i) Likely date of start of construction and likely date of completion (Time schedule for the project to be given).**

Since the geological reserve is sufficient enough, therefore question of time scheduling for abandonment does not arise in this scheme period.

Time schedule of all abandonment operations as proposed is as follows:

Tentative date of closure of the mine: - after 11 years. (Based on mineralized zone)

It is to be noted here that the area is potential one and the reserve will be much more than the estimated reserve when the exploration will be completed in future.

(ii) Estimated project cost along with analysis in term of economic viability of the project.

The project cost expected for this expansion proposal is Rs.35.5 crores.

Financial Assurance

An amount of Rs.32969400(Three Cores Twenty nine lakhs Sixty nine thousand four hundred) has been deposited against the financial assurance .

CHAPTER – 9

ANALYSIS OF PROPOSAL (FINAL RECOMMENDATIONS)

- (i) **Financial and social benefits with special emphasis on the benefit to the local people including tribal population, if any, in the area.**

Due to mining activities in the M.L area, 775 nos. of persons, who includes technical, supervisory, other highly-skilled & skilled category, including the present and proposed employment potential some more persons may be associated with this project to carry out some other developmental jobs as per need-base from time to time. Satellite income such as shopping, supply of food items, tailoring, hoteling etc. are extra. Medical, transport, communication facilities including the purchase facilities and cultural improvement will be developed. Moreover the general awareness and lifestyle of the people in the area will be improved.

The support extended in the field of education, medical facilities, recreation facilities shall improve the normal status of the living of the local inhabitants. The members of the family of the employee shall also get proportionate benefit out of it.

This mining project is financial viable and can comply with the environmental norms.