

Mining Plan

Including Progressive Mine Closure Plan
(Under Rule 22(4) of MCR 1960 & Rule 22B of MCDR 1988)



Extent: 72.15 Ha

Applied Mining Lease Area (Sarangpani Iron & Manganese Ore Deposit)

at

Gollarhatti Village,
CN Halli Taluka, Tumkur District,
Karnataka.

of

M/s. Mineral Enterprises Limited

300/1B, 16th Cross, SadhashivaNagar,
Bangalore

This Mining Plan is approved subject
to the conditions / stipulations
indicated in the Mining Plan approval
letter No. MP/TMIS/FeIM-231-SZ
Date. 16/2/2009

Revenue Land

Mechanised - 'A'

Controller of Mines (SZ)
खान निष्पाक (र. अं)
Indian Bureau of Mines
भारतीय खान ब्यूरो
Bangalore / बेंगलूर

Prepared by

Dr. D.N Gulhane & S.Kameswara Rao
ROP/BNG/242/2007/B



GLOBAL ENVIRONMENT & MINING SERVICES

(Consulting Engineers, Mine Designers, Geologists & Surveyors)



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भारतीय खान ब्यूरो/ INDIAN BUREAU OF MINES
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OFFICE OF THE CONTROLLER OF MINES (SOUTH ZONE)

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Yeshwanthpur, Bangalore- 560 022



No. MP/TMK/FeMn-231-SZ

Date: 16.02.2009

To M/s Mineral Enterprises,
No. 300/1B, 16th Cross, Sadashivanagar
Bangalore-560 080, Karnataka State.

Sub: Approval Mining Plan (including Progressive Mine Closure Plan) for grant of Mining Lease for Iron and Manganese Ore over an area of 72.15ha in Gollarahalli Village, CN Halli Taluk, Tumkur District, Karnataka State of M/s Mineral Enterprises. submitted under rule 22 of MCR 1960.

Ref: Your letter No. Nil dated 16.12.2009 submitting five bound copies of the Mining Plan.

Sirs,

In exercise of the power conferred by the clause (b) of subsection (2) of section 5 of Mines and Minerals (Development & Regulation) Act, 1957, read with Government of India order No.S.O.445 (E) dated 28.04.1987, I hereby **approve** the aforesaid Mining Plan (including Progressive Mine Closure Plan). This approval is subject to the following conditions:

1. The Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the area from time to time whether made by the Central Government, State Government or any other authority.
2. The Mining Plan (including Progressive Mine Closure Plan) is approved without prejudice to any order or direction from any court of competent jurisdiction.
3. It is also clarified that the approval of your aforesaid Mining Plan (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provision of the Mines and Minerals (Development & Regulation) Act, 1957, or the rules framed there under and any other law.
4. Provisions of the Mines Act, 1952 and Rule & Regulations made there under including submission of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.
5. The Environment Monitoring Cell of the company shall be established. The Environment Monitoring Cell of the Company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core zone and buffer zone as per Dept. of Environment guidelines and keeping in view CCOM's Circular No.3/92 season-wise every year by engaging the services, preferably of an Environmental laboratory approved by MOEF/ CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.

Contd....2

No. MP/TMK/FeMn-231-SZ

6. A copy of EIA/ EMP report, approved by MOEF, New Delhi, should be submitted to this office as well as to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, within one month of approval along with a copy of their approval letter.
7. The execution of the Mining Plan (including Progressive Mine Closure Plan) shall be subjected to vacation of prohibitory orders/ notices, if any.
8. If anything is found to be concealed as required by the Mines Act in the contents of the Mining Plan and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.
9. This approval of the Mining Plan (including Progressive Mine Closure Plan) is subject to the condition that the lessee should furnish Financial Assurance of Rs.7,08,750/- (rupees seven lakh eight thousand seven hundred fifty only) as required under rule 23F(3) of MCDR 1988 to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, before execution of the Mining Lease.
10. A yearly report should be submitted before 1st July of every year setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved Mine Closure Plan after starting of Mining Operations.
11. A copy of the Mining Lease Deed should be submitted to this office as well as to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, within a period of 30 days from the date of execution of the Mining Lease.

Yours faithfully,

Encls: Two copies of approved Mining Plan
(including Progressive Mine Closure Plan).

(Dr. B.P.SINHA) 209

खान नियंत्रक (द.आ.)

Controller of Mines (SZ)

Copy for kind information to:

- 1 Dr D.N.Gulhane, GLOBAL Environment & Mining Services, "Devakinandan"Opp. PLD Bank, Venkateshwara Talkies Road, Patel Nagar, Hospet-583 201, Bellary District, Karnataka State
2. The Chief Controller of Mines, Indian Bureau of Mines, Nagpur- 440 001.
3. Director of Mines & Geology, Govt. of Karnataka, Khanij Bhavan, Race Course Road, Bangalore 560 001 with a request that lease should not be executed unless a written statement is obtained from Regional Controller of Mines, Indian Bureau of Mines, Bangalore, to the effect that the Financial Assurance has been furnished by the applicant.
- 4 Director of Mines Safety, Directorate General of Mines Safety, Chennai Region, No. 46 (old) 5 (new) 2nd Street, Block AA', Anna Nagar, Chennai- 600 040, **along with a copy of approved Mining Plan (including Progressive Mine Closure Plan).**
5. The Regional Controller of Mines, Indian Bureau of Mines, Bangalore, **along with a copy of approved Mining Plan (including Progressive Mine Closure Plan)** for further follow up.
Encl:As above

(Dr. B.P.SINHA)

खान नियंत्रक (द.आ.)

Controller of Mines (SZ)

Mining Plan

Including Progressive Mine Closure Plan

(Under Rule 22(4) of MCR 1960 & under Rule 23 B of MCDR, 1988)

of

APPLIED MINING LEASE AREA

(Sarangpani Iron & Manganese Ore Deposit)

at

*Gollarhatti, Village
C N Halli taluk, Tumkur District
Karnataka*

M/s. Mineral Enterprises Limited.

*#300, 16th cross, Sadashiva Nagar
Bangalore, Karnataka*

Extent:- 72.15 Ha.

Revenue Land

Mechanised - 'A'

Prepared by

Dr. D.N Gulhane & S.Kameswara Rao
RQP/BNG/242/2007/B

GLOBAL ENVIRONMENT & MINING SERVICES
(Consulting Engineers, Mine Designers, Geologists & Surveyors)



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M/s Mineral Enterprises Ltd

No.300/1B, 16th Cross
Sadashiva Nagar,
Bangalore - 560080
Phone: 080-3619939, 3612589



Date: 16th Feb 2009

CERTIFICATE

This is to certify that the Mining Plan of Applied mining lease area (Sarangpani Iron and Manganese Deposit) of M/s Mineral Enterprises Ltd, Bangalore over an extent of 72.15 Ha in Gollarhatti Village, C.N.Halli Taluk, Tumkur district, Karnataka State, has been prepared in full consultation with us and we have understood its contents.

We agree to implement the same in accordance with law.

Basant Poddar
Managing Director

M/s Mineral Enterprises Ltd

No.300/1B, 16th Cross
Sadashiva Nagar,
Bangalore - 560080
Phone: 080-3619939, 3612589



CERTIFICATE

Certified that the Progressive Mine Closure Plan of Applied mining lease area (Sarangpani Iron and Manganese Deposit) of M/s Mineral Enterprises Ltd, Bangalore over an extent of 72.15 Ha in Gollarhatti Village, C.N.Halli Taluk, Tumkur district, Karnataka State, has been prepared by taking into consideration all statutory rules, regulations orders made by the Central/State Government, Statutory Organizations, Court etc.,

I agree to implement all the measures in this Progressive Mine Closure Plan in a time bound manner as proposed, and whenever specific permission is required concerned authorities will be approached for obtaining the permission.


Basant Poddar
Managing Director



Date: 16th Feb 2009

CERTIFICATE

Certified that the provisions of Mines Act, Rules and Regulations made there under have been observed in this Mining Plan of Sarangapani applied mining lease area of M/s Mineral Enterprises Ltd, Bangalore over an extent of 72.15 Ha in Gollarhatti Village, C.N.Halli Taluk, Tumkur district, Karnataka State, and where specific permissions is required the applicant will approach the DGMS. Further standards prescribed by DGMS in respect of Miners Health will be strictly implemented.

Certified that the information furnished in the above Scheme of Mining is true and correct to the best of our knowledge

Dr. D N Gulhane
Key person

S. Kameswara Rao
RQP / BNG / 242 / 2007 / B
Authorised Signatory



GEMS



GLOBAL ENVIRONMENT & MINING SERVICES

(Consulting Engineers, Mine designers, Geologists & Surveyors)

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Patel Nagar, Hospet - 583 201 Dist. Bellary (Karnataka) India.

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Tel/Fax : +91-8394-375224 / 237555
E-mail : gems_hq@yahoo.co.in



Date: 16th Feb 2009

CERTIFICATE

Certified that the provisions of Mineral Conservation and Development Rules (MCDR) 1988 have been observed in this Mining Plan of Applied mining lease area (Sarangpani Iron and Manganese Deposit) of M/s Mineral Enterprises Ltd, Bangalore over an extent of 72.15 Ha in Gollarhatti Village, C.N.Halli Taluk, Tumkur district, Kamataka State, and whenever specific permission is required the applicant will approach the concerned authorities of Dept. of Mines and Geology / Indian Bureau of Mines for obtaining the permission.

Dr. D N Gulhane
Key person

S.Kameswara Rao
RQP / BNG / 242 / 2007 / B
Authorised Signatory

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MINING PLAN OF "SARANGPANI IRON AND MANGANESE ORE DEPOSIT"

OF

M/s MINERAL ENTERPRISES LIMITED



INTRODUCTION:

M/s Mineral Enterprises Limited has been recommended an area to the extent of 72.15 Ha, in survey No's 71, 70, 69, 74, 11 and 12 in Gollarhatti Village, C.N.Halli Taluk, Tumkur District, Karnataka for the mining of Iron, manganese and yellow ochre. The government letter in this regard bearing No. ಗವುಲಾಣ: ಗವುಲಾಣ /233/AML-99/07-08/10437 dated 18.10.2007 is enclosed as **Annexure – I**. This iron ore deposit is having an average grade of 60.5% Fe. The area is geologically surveyed and representative samples collected and analysed. It is a promising area for the iron mining.

It is proposed to produce maximum 1450066 tonnes of iron ore and manganese ore from this area by mechanized opencast mining operations category 'A'.

Before execution of this deposit, as a statutory requirement a mining plan is prepared under rule 22 of MCR 1960 and along with the progressive mine closure plan under rule 23B(1) of MCDR 1988 for the approval of Indian Bureau of Mines.

This Mining Plan is approved subject to the conditions / stipulations Indicated in the Mining Plan approval letter No. *MP/Tmk/ADM-231-82* Date...*16/2/2009*

[Signature]
Controller of Mines (sz)
खान नियंत्रक (द.अ.)
Indian Bureau of Mines
भारतीय खान ब्यूरो
Bangalore / बंगलूरु

1.0 GENERAL

a) **Name & address of applicant** : M/s Mineral Enterprises Limited
#300/1B, 16th Cross,
Sadashivanagar
Bangalore - Karnataka

b) **Status of applicant** :

Private Individual	:	No
Cooperative Association	:	No
Private Company	:	No
Public Company	:	Yes
Public Sector Undertaking	:	No
Joint Sector Undertaking	:	No
Other (Pl. specify)	:	NA

The list of board of directors is enclosed vide **Annexure - II**

c) **Mineral/s which are occurring in the area and which the applicant intends to mine** : Iron ore, Manganese ore, Red oxide and yellow ochre

d) **Period for which the mining lease is granted/renewed/proposed to be applied:**

The mining lease is recommended by the Govt of Karnataka vide letter No. ಸಭೋ: ಸಗುಶಾ /233/AML-99/07-08/10437 dated 18.10.2007 Copy of the same is enclosed as **Annexure - I**





e) **Name & address of RQP Preparing Mining Plan**

Dr. D.N.Gulhane Key person	S.Kameswara Rao Authorised signatory
Reg. No. :RQP/BNG/242/2007/B RQP Validity up to 4 th March, 2017	
Global Environment & Mining Services "Devikanandan" Opp PLD Bank, Patel Nagar Hospet – 583201. Bellary Dist. Karnataka, India Ph : 08394 – 329294 / 223755 Fax: 08394 223755, Mobile : +919449830533 / +919448479433	

f) **Name of Prospecting Agency** : M/s Mineral Enterprises Limited
Bangalore

g) **Reference No. And date of consent letter from the State Government G.O.**
No.

The mining lease is recommended by the Govt of Karnataka vide letter No.

ಸಂಖ್ಯೆ: ಗಣಿಶಾ /233/AML-99/07-08/10437 dated 18.10.2007

2.0 LOCATION AND ACCESSIBILITY

Location :

The applied mining lease area 'Sarangpani Ironore and Manganese Deposit' falls in Gollarhatti village, C N Halli Taluk, Tumkur Dist. Karnataka and the deposit is located at 7kms Northeast of the C N Halli. The area falls in Toposheet No. 57 C/11 with in the Longitude from 76°40'00" to 76°41'00" and Latitude from 13°25'00" to 13°25'30"

The distance from the mining lease for the major cities of Karnataka state is as under.

Tumkur --- 68 kms.

Bangalore ---- 138 kms.

The nearest railway station is Ammasandra, which is about 22 kms from mine

The nearest airport is Bangalore, which is about 140 kms from the lease area.

- | | | | |
|-------|---|---|---|
| a) | Details of area (with location map) | : | The recommended mining lease is marked on Survey of India Toposheet No 57 C/11. A key plan is enclosed vide Plate No.1 |
| i) | District and state | : | Tumkur, Karnataka |
| ii) | Taluk / Mandal | : | Chikkanayakanahalli |
| iii) | Village | : | Gollarhalli |
| iv) | Khasara No./ Plot No. / Block / Felling Series etc | : | Survey Nos 71, 70, 69, 74, 11 and 12 |
| v) | Lease Area (Hectares) | : | 72.15 Ha (178.3 Acres) |
| vi) | Whether the area is recorded to be in forest (please specify whether protected, reserved etc.,) | : | Not Applicable |
| vii) | Ownership / Occupancy | : | Govt Revenue land |
| viii) | Existence of public road/railway line, if any, nearby and approximate distance | : | The area is approachable by all-weather road and is |

7km away from Taluk head quarter. C.N.Halli, which is 55 km from Tumkur.

- ix) Toposheet No. With : Toposheet No. 57 C/11.
 latitude : 76°40'00" to 76°41'00"
 longitude : 13°25'00" to 13°25'30"

x) Land Use Pattern (Forest, Agricultural, Grazing, Barren etc.) :

The entire mining lease area to the extent of 72.15 Ha is Govt revenue land and falls in survey Nos 71, 70, 69, 74, 11 and 12. It is barren with thorny bushes and shrubs with thin vegetation. There is no agriculture or forestland. The details of the surrounding landuse and the mining lease area are shown on the key plan.

The present landuse of core zone of mine area is given below

Type of Activity	Area in (Ha)
Area excavated	0.20
Roads	0.80
Area remains untouched.	71.15
Total	72.15

- b) Attach general location and vicinity map showing area boundaries and existing and proposed access roads. It is preferred that the area be marked on a Survey of India Topographical map or as the case may be. However if none of these are available the area should be shown on accurate sketch map on a scale of 1: 50000.**

A key plan is prepared in 1: 50000 scale and enclosed vide **Plate No .1** showing the details of land use in 5 Kms radius, roads, villages etc.

3.0 GEOLOGY AND EXPLORATION

- a) Briefly describe the topography and general geology and local/mine geology of the mineral deposit include drainage pattern.

a. **Topography of the area**

The deposit in this area is restricted to the hilly terrain. The Eastern side of the lease is showing the hill plateau and western side is a flat area. The hillocks are more or less of similar size and height. The maximum RL is 1027m and minimum RL is 850m. The lateritic capping and iron ore are exposed on the hill top. There is no nalla with in the lease area however there are few water course within the lease area that drains the rainwater out side the lease

b. **Regional geology and local geology**

The area falls under Dharwar schist belt of Tumkur district. The major rock types are Laterite, Banded Hematite Quartzite (BHQ), Schist, Shales and Phyllites. Dolorite dykes and quartz veins frequently intrude into the formations. Younger granites form the outer margins of the schist belt. The formations are folded. The limbs extend towards North West and South – East with local variations. Dips are not consistent and vary due to folding, in direction and magnitude.

The generalized and stratigraphic geological sequence is as given below.

	Greywcke, Chart, Phyllite, Banded Ferrous Chert,

Chitradurga group	Ingladhil volcanics and associated Sulphide iron formations Fe - Mn iron formation Limestone, Iron ore, Phyllite Talya, Conglomerate
-----	-----
Bababudan group	Unconformity (?)----- Amygdular basalt and clastics and associated para- gneisses Neralkatte quartz – pebble conglomerate
-----	-----
	Unconformity (?)----- Older gneissic complex

Local Geology :

The said lease area is confined to the Chitradurga formation. The iron ore occurs in this area is associated with shale, The geological sequence of the formation is given below.

Laterites/ manganese ore float in manganiferous clay
 Iron Ore
 BHQ / Shale / Phyllites



Geologically the area indicates lateritic capping overlain the iron ore. The host rock of the iron ore formation is BHQ and it is associated with Shale and phyllites. The manganese ore float is seen embedded in the manganiferous clay.

The strike of the iron ore body is NW – SE and dip 65⁰ due SW. The length of the iron ore body is 400m in length and 254m wide. The occurrence of manganese ore float embedded in manganiferous clay is extended in the area upto 309m in length and 88m wide. The iron ore mineralization appears upto 50 to 70 meters depth in the adjacent mine.

The geological map and geological sections of the applied lease area is enclosed vide **plate No 4** and **plate No 5**.

- b) **The topographical plan of the lease area prepared on a scale of 1:1000 or 1:2000 with contour interval of 3 to 10 m. depending upon the topography of the area should be taken as the base plan for preparation of geological plan. The details of exploration already carried out including evidences of mineral existence should be shown on the geological plan.**

The topographical (surface) plan is prepared with 5m contour intervals on a scale 1:2000 and enclosed vide **Plate No 3**. The geological features and the location of the proposed boreholes are shown in the geological Plan enclosed vide **Plate No 4**.

There are two pits excavated in past for illegal mining up to the depth of more than 3m. The iron ore is exposed in both the pits. There are extensive mining activities going on both the sides, on strike direction of this lease area. The depth of mineralization of the ore bodies exposed in the adjacent mine is more than 70m from surface. The area is surveyed and mapped geologically. Totally 45 surface sample collected and analysed from this area. The samples mainly collected on ore body and lateritic capping.

- c) **Geological sections should be prepared at suitable intervals on a scale of 1:1000 / 1:2000.**

Representative geological cross-sections are drawn at every 100 m interval in 1:1000 scale and enclosed vide **Plate No. 5**.

- d) **Broadly indicate the year wise future program of exploration, taking into consideration the future production program planned in next five years as in table below:**

Totally 7 boreholes are proposed to drill up to the depth of 80 to 100m to know the quality and extension of the iron ore with in the first five years of this mining plan period. Apart from this two pits of 1.5m X 1.5m X 6m depth is proposed in the manganese float area in the first year. The location of these boreholes and pits are shown on geological map enclosed vide **Plate No 4**.

Year	No of Boreholes	Total meterage	No of pits and dimension	No of trenches and dimension
I - Year	4	320 to 400	Nil	Nil
II - Year	3	240 to 300	Nil	Nil
III - Year	-	-	-	-
IV - Year	-	-	-	-
V - Year	-	-	-	-

The location and the angle of the borehole is given in the table shown below:

SI No	Year	Location on Section	B H No	Depth	Inclination
1	1 st year	Section AA'	PBH 1	80m to 100m	70° Northeast
		Section BB'	PBH 2		
2	2 nd year	Section CC'	PBH 3	80m to 100m	70° Northeast
			PBH 4		
			PBH 5		
		Section DD'	PBH 6		
			PBH 7		
Total			7		

- e) **Indicate geological and recoverable reserves and grade, duly supported by standard method of estimation and calculations along with required sections (giving split up of various categories i.e., proved, probable, possible indicate cut-off grade. Availability of resources should also be indicated for the entire leasehold.**

For estimating the reserves, the volume of the iron in each section has been calculated by multiplying the cross sectional area by the sectional influence. The volume is multiplied by 2.8 (in-situ density) to work out tonnage. Based on the available geological data the recovery of iron ore is considered as 70%. For assuming the depth of the iron ore, the dip of the band, its plunge and height above the ground level were taken into consideration. Further to that based on the depth of exposed mineralisation the proved iron ore is considered upto 50m, probable iron ore upto 20m depth below proved iron ore and the possible iron ore 10m below the probable iron ore.

The category wise geological reserves of iron ore in this deposit is given in the table shown below and the calculations are enclosed as **Annexure – III**.

Category wise Iron ore reserves

Category	Quantity in Tons
Proved	9789063
Probable	4349201
Possible	2186772
Total	16325036



The geological reserves with UNFC Classification and average grade are given in the table given below.

Category	Geological Reserves Tons	Mineable reserves Tons	UNFC Classification	Grade %
Proved	9789063	9643040	211	Fe > 52%
Probable	4349201	4141679	221+222	
Possible	2186772		334	
Total	16325036	13784719		

The float manganese reserves area calculated upto 3m depth by considering 20% of recovery of total volume and 2.8 t/m³ sp gr. The manganese floats ore reserves along with UNFC codification is given in the table shown below

Category	Geological reserves	Mineable reserves	UNFC Classification	Grade %
Proved	31332	29627	211	Mn > 38%

- f) Indicate mineable reserves by slice plan/level plan method, as applicable as per the proposed mining parameters.

The total mineable reserves in this lease area by bench wise is calculated as 13784719 tonnes. The benchwise mineable reserves and waste are given below:

Bench Mark	Iron Ore (Tonnes)	Waste in Tonnes	RATIO
+1024	9744	82104	1:8.40
+1018	152706	451928	1:2.95
+1012	434913	472459	1:1.08
+1006	577592	490615	1:0.84
+1000	691180	513150	1:0.74
+994	813478	614486	1:0.75
+988	920906	666941	1:0.72
+982	987742	654599	1:0.66
+976	1068474	637696	1:0.59
+970	1135702	666142	1:0.58
+964	1132312	633255	1:0.55
+958	1127118	584360	1:0.51
+952	1111614	536063	1:0.48
+946	1090838	481349	1:0.44
+940	1075687	428089	1:0.39
+934	779472	286785	1:0.36
+928	230241	93502	1:0.40
+922	147255	60960	1:0.41
+916	136044	52587	1:0.38
+910	124617	43899	1:0.35
+916	37083	12487	1:0.33
Total	13784719	8463457	1:0.61

The mineable manganese ore reserves are given below.

Manganese ore 'Tons'	Waste 'Tons'
29627	93113

4.0 MINING

- a) **Briefly describe the existing/proposed method for developing/working the deposit with all design parameters.**

It is a virgin area and no mining operations are taken up so far in this area except small broken up area excavated in past.

Now it is proposed to develop this mine for the maximum production of 1450066 tonnes of iron and manganese ore annum.

The fully mechanised mining method shall be adopted to achieve a production of 1450066 tonnes of iron ore and manganese from the fifth year of the mining plan period. The benches shall be maintained to 6m heights with minimum width of working bench shall be 18m to facilitate easy movement of mining machinery and safety factor. The ultimate bench width shall be 6m and the individual bench slope and ultimate pit slope shall be 45° . The benches shall be oriented in the strike direction and the gradient of the haul road shall be maintained to 1:14. The bench design shall conform to MMR, 1961. It is expected that nearly 20% of the area requires drilling and blasting. The drilling shall be carried out by 115 mm dia DTH drill and blasting by conventional explosive. The blasted iron ore shall be loaded to dumpers by excavators and hauled to crushing and screening plant located inside the lease area.

The sequence of mining involves drilling and blasting, whenever required. Excavation and loading of ore and waste to taurus by excavators. The ore shall be taken to the screening and crushing plant for sizing where as waste to the waste dump area.

The area for proposed production in next five years is having length of 410m and width 360m. It is proposed to develop this mine slice wise. Only seven benches of 6m height are planned during the first five year of mining plan period. The pit shall be worked with in the 1027m and 982m RL. As such there is no topsoil is going to generate directly as it is adhere with lateritic capping, the soil generate after crushing the laterites. Totally 205682 tonnes lateritic soil is expected to



generate in these five years period. The soil shall be stacked all along the green belt area and shall be afforested. The production of iron ore and waste development shall be done systematically.

Five excavator, One wheel loader, One dozer, One drill machine and fifteen taurus would be deployed for the mining operations. The soil shall be dumped in the predetermined green belt area as shown in landuse plan vide **Plate No-10**.

- b) **Indicate quantum of development and tonnage and grade of production expected pit wise as in table below.**

It is proposed to mine this area in all the sections and the mining shall be done slice wise covering a length of nearly 400m and width 360m. In these proposed workings the bench levels worked shall be 1027m to 982m. Sufficiently wide ramp roads with 1:14 gradient shall connect the benches. The bench positions are indicated in the enclosed **Plate 6A to 6E** showing pit positions at the end of every year. During this plan period 4600123 tonnes of iron ore and manganese ore shall be produced.

The proposed year wise development and production quantities are given below.

Figures are in Tons

Year	Pit No(s)/ Block Section No	Over-Burden Soil/ Waste	ROM Ore		Total	Saleable Iron Ore	Saleable Manganese Ore	Sub grade Iron ore	Ore to over burden ration
			Iron ore	Manganese					
I	Section BB' to DD'	240383	395024	5001	400025	375273	5001	19751	1 : 0.60
II	Section AA' to DD'	669440	795015	5001	800016	755264	5001	39750	1 : 0.82
III	Section BB' to DD'	772739	945000	5001	950001	897750	5001	47250	1 : 0.81
IV	Section BB' to EE'	699034	995014	5001	1000015	945263	5001	49751	1 : 0.70
V	Section AA' to EE'	893158	1440445	9621	1450066	1368422	9621	72022	1 : 0.60
Total		3274754	4570498	29625	4600123	4341972	29625	228524	

The typical chemical specifications of the iron ore samples analyses from this area are given below:

SL No	Fe%	SiO ₂	Al ₂ O ₃
1	62.54	3.45	2.80
2	60.21	4.21	3.01
3	58.33	4.55	4.60



The proposed year wise development and production quantities are given below along with location and working RL. The detailed calculations are enclosed vide **Annexure – V.**

Year	Iron Ore and Manganese ore		Waste	
	Quantity (Tons)	Location and RL	Quantity (Tons)	Location and RL
1 st year	400025	2425 E to 2650 E 1025 N to 1320 N RL from 1018m to 1012m	240383	2425 E to 2650 E 1025 N to 1320 N RL from 1018m to 1012m
2 nd year	800016	2395E to 2670 E 960 N to 1325 N RL from 1024m to 1000m	669440	2395E to 2670 E 960 N to 1325 N RL from 1024m to 1000m
3 rd year	950001	2365 E to 2690 E 960 N to 1375 N RL from 1018m to 994m	772739	2365 E to 2690 E 960 N to 1375 N RL from 1018m to 994m
4 th year	1000015	2360 E to 2715E 960 N to 1325 E RL from 1018m to 988m	699034	2360 E to 2715E 960 N to 1325 E RL from 1018m to 988m
5 th year	1450066	2350 E to 2750 E 960 N to 1325 E RL from 1018m to 986m	893158	2350 E to 2750 E 960 N to 1325 E RL from 1018m to 986m
Total	4600125		3274754	

c) Attach- Individual year wise plans & sections (in case of 'A' class mines)

Pit positions at the end of the 1st year to 5th year are shown in the Plate No 6A to 6E respectively. The year wise movements of faces are shown in the production and development sections enclosed vide Plate No. 7.

- d) **Attach supporting composite plan and section showing pit layouts, dumps, stacks of sub-grade mineral, if any, the year from which effected.**

Only 228524 tonnes sub-grade iron ore is likely to generate in the first five years of the mining plan period (i.e. 5% of total ROM is treated as sub grade mineral). However no mineral rejects are expected to generate. The sub grade iron ore shall be stacked in the 2.0 Ha predetermined area as shown in the land use plan.

- e) **Indicate proposed rate of production when the mine is fully developed, and the expected life of the mine and the year from which effected.**

Proposed rate of production from the fifth year of the mining plan shall be 1450066 tones. Taking overall proved mineable reserves of 13784719 tons, and production of about 4600123 tonnes in the first five years, the expected life of the mine shall be 10 years.

- f) **Attach a note furnishing a conceptual mining plan for the entire lease period (for 'B' category mines) and up to the life of mine (for 'A' category mines) based on the geological, mining and environmental considerations.**

Conceptual mining plan:

For any mine, preparation of conceptual mine plan amounts to, fore-seeing in totality and planning for mining and related activities through-out its life span, till such time all the usable ore / minerals are exhausted to the economical limits and lease area is reclaimed to the extent possible. Apart from physico-chemical and mineralogical parameters which form primary basis for compilation of conceptual mine plan, several other factors such as grade of sub- grade ores, marketability and the norms laid down by the Government agencies from time to time do play important roles. With ever increasing and changing needs of humanity, coupled with technological advancements, sub grade ores of the date become marketable ores in future.

Therefore, preparation of ideal conceptual mine plan for any mine is difficult and such plan prepared, remains acceptable only under given circumstances. It

cannot be overlooked that, any such plan undergoes amendments and revisions in the course of progressive stages of exploration and exploitation.

It is always borne in mind to bring back near natural shape to the area and its economic value is elevated. It is further ensured that, there is positive contribution to the environment and socio-economic development of the region.



As per the available details the conceptual plan is prepared for the working pit covering all the sections. The conceptual plan and the conceptual sections are enclosed vide **Plate No 8 and Plate No 9**. There shall be only one pit at the end of mining as shown in the conceptual plan, that shall act as a pond during rainy season. A phisiculture shall be planned in this pond. A part of Pit on section shall be backfilled after obtaining permission from IBM. The areas required for mining, dumping of waste, sub grade stacking and for other infrastructure is shown on the Land use Plan.

However based on results of additional exploration as proposed, the conceptual plan is likely to be subjected for modification.

(i) Mineable reserves and anticipated life of the mine:

Proposed rate of production from the fifth year of the mining plan shall be 1450066 tones. Taking overall proved mineable reserves of 13784719 tons, and production of about 4600123 tonnes in the first five years, the expected life of the mine shall be 10 years.

(ii) Exploration:

The proposed 9 boreholes for exploration are shown in the enclosed Geological plan vide Plate No.4

(iii) Mine Development:

The mine shall be opened from section AA' to EE' and it shall be developed slice wise. The height of the each bench / slice shall be 6m. The soil generated shall be stacked all along the green belt area and afforested. The drilling and blasting, where ever required shall be drilled with 115mm dia DTH rig. The excavated



ROM shall be processed at screening and crushing plant for sizing, where as the waste shall be dumped at the predetermined place as shown in the land use plan.

(iv) Environmental Aspects:

The over burden for this plan period is mainly lateritic soil, shale / phyllites and intercalated waste. The lateritic soil shall be stacked in the predetermined place of 2.00 Ha, earmarked as shown in the landuse plan. The pure waste shall be dumped on the 5.5 Ha area as shown in the land use plan. The dump shall have retaining wall all around. The dump slopes would be terraced and afforested using agave, grasses and legumes tree species.

A green belt would develop all along the ultimate pit limit using fast growing tree species with dense canopy in tune with the local biodiversity. The watering in summer season shall be done weekly twice by deploying water tanker. The rate of survival expected is about 80%.

At the end of the mining entire pit, and dumps shall be terraced, stabilized and afforested with preferably fruit plants and other local varieties. The leftover pit even after backfilling shall be used as rainwater pond. This improves the ground water potential in the area.

g) Opencast Mines:

i) Describe briefly giving salient features of the mode of working (mechnised, semi-mechnised, manual)

The mode of working shall be mechanised opencast mining methods. The operations involved are.

1. Drilling shall be carried out by DTH drill of 115mm dia. The burden and spacing shall be 3 m and 3.5 m respectively.
2. Blasting - The holes shall be blasted using slurry explosives and Ammonium Nitrate fuel oil mixture
3. The blasted material shall be loaded into tippers by excavators.



4. The loaded tippers shall be hauled to the crushing plant located in side the lease.
5. The waste material shall be haul to the predetermined dumping yard.
6. The sub-grade minerals shall be stacked separately in the pre-determined yards, which shall be blended suitably whenever it finds feasible.

ii) Describe briefly the layout of mine workings, the layout of faces and sites for disposal of over burden/waste. A reference to the plans enclosed under 4 (b) and 4(d) will suffice.

During the plan period the mining on section AA' to EE' would be carried out with the length of 410 m and width of 360m.

The benches are proposed to work during this first five years of mining plan period shall be between 1027m and 982m level. The bench height shall be 6 m with minimum width of 18m for working bench. The bench position at the end of each year is shown in Plate No 6A to 6E. The sequence of workings are also depicted in cross sections enclosed vide **Plate No.7.**

Hardly 5% sub grade out of ROM is expected to be generated in this mining plan period, however that shall be stacked on the earmarked 2.0 Ha area for sub grade ore stacking as shown in the land use plan. A composite plan vides Plate No 12 (progressive mine closure plan) is enclosed showing the proposed waste dumps, sub grade mineral yard etc.

h) Underground Mines: Not applicable

i) Extent of Mechanisation

(1) Drilling :

During this mining plan period, the maximum handling is estimated is about 2343224 tonnes in the fifth year. The drilling and blasting in this area is about 20%. The calculations of requirement of drilling machines are as given below.

Total material handled (max.) per annum shall be 2343224 tons.

Out of that 20% of ROM requires drilling and blasting = 2343224T X 20%
= 468645Tonnes



Height of the bench	--	6 m
Hole depth	--	6.6m (10% extra for toe)
Burden	--	3 m
Spacing	--	3.5 m

Therefore the drilling machine required per year is calculated as under:

Rock broken / hole of 6.6 m depth with a bench height of 6m

$$\text{Burden} \times \text{Spacing} \times \text{Depth} \times \text{b.d} \\ 3.0\text{m} \times 3.5 \text{ m} \times 6\text{m} \times 2.8 \text{ t/cu.m} \times 80\% \text{ efficiency} = \mathbf{141 \text{ tons}}$$

$$\text{Therefore, rock broken/m} = 141/6.6 \text{ m} = 21.40 \text{ tons/m}$$

$$\text{Drilling meterage required/yr} = \frac{468645 \text{ tonnes}}{21.40} = 21899 \text{ m}$$

$$\text{Therefore drilling required per day} = 21899\text{m}/300 \text{ days} = 73 \text{ m/day}$$

Each DTH drill can drill 120m to 150m/day per shift

Considering 80% availability, One drill machine are enough to cater the requirement.

Sl. No.	Type	Nos.	Dia of Hole mm	Make	Motive Power	H.P
1	DTH Drill	1	115	Atlas Capco	Comp. Air	--

(2) Loading Equipment:

Total handling of maximum ore shall be 2343224 tonnes in the fifth year of the plan period.

The following loading equipments shall be deployed to handle the 1450066 tonnes iron ore and 893158 tonnes rejects = 2343224 tons.

$$\text{Total quantity to be handled max} = 2343224 \text{ tons}$$

$$\text{No. of working days per year} = 300$$

$$\text{No. of operating hours/day} = 7 \text{ (effective hours in one shift)}$$

$$\text{Loading Capacity of each Excavator} = 300 \text{ tons/hour}$$

$$\text{No. of excavators required} = \frac{2343224}{300 \times 7 \times 300} = 3.72$$

Considering 80% availability 5 Excavators are required to handle the iron ore and waste. Along with that one wheel loader is required to support the loading and handling.

Type	Nos.	Bucket Capacity M3	Make	Motive
Excavator	5	1.2	Volvo	Diesel
Wheel Loader	1	2.6	Volvo	Diesel

(3) Haulage and Transport Equipment:

(a) Haulage within the mining lease-hold

For handling a max. Quantity of 1450066 tonnes iron ore to crushing and screening plant and 893158 tonnes waste at the dumping yard the number of taurus required are given below

Total quantity of iron ore and waste to be handled max = 2343224 tons

No. of working days per year = 300

No. of operating hours/day = 7

Capacity of each Dumper = 30 tons

No. of trips required per hour = $\frac{2343224}{300 \times 7 \times 30} = 37.19 \text{ trips}$

Each dumper can make 3 trips per hour

No. of Dumpers required shall be = $\frac{37.19 \text{ trips}}{3} = 12.4 \text{ Nos}$

Considering 80% availability 15 taurus are required to handle the iron ore

Type	Nos.	Size/Capacity	Make	Motive Power	Remark
Taurus	15	30 tons	Ashok Leyland	Diesel	For magnetite transportation

Whether the dumpers are fitted with exhaust conditioner should be indicated: Not applicable.



(b) Transport from mine-head to the destination.

The iron shall be transported to the railway station at Ammasandra at 22 km from this deposit. The requirement of taurus for transporting this iron ore is given below. The material shall also be transported by road to the consumers.

Total tonnage of iron ore = 1378043

No of days = 300 days

Per day transportation = $1378043 / 300 = 4592$

4592 tonnes/30 tonnes/ 1 trips per in two hours / 8 hours Transportation = 38 Taurus

Considering 80% availability 48 Taurus are require to transport iron ore to Ammasandra railway station.

Type	Nos.	Size/Capacity	Make	Motive Power
Taurus	24	30 tonnes	Volvo	Diesel

(4) Miscellaneous:

Describe briefly any allied operations and machineries related to the mining of the deposit not covered earlier.

a) Operations

For dust suppression one water tanker with spraying arrangement shall be deployed for haul roads and mine workings.

b) Machineries Deployed:

The following machineries are proposed to be deployed for associated mining activities.

Type	Nos.	Size/Capacity	Make	Motive Power
Dozer	1	D-80	BEML	Diesel
Water tanker	1	8,000	Telco	Diesel
Rock breaker	1		rammer	Diesel

5.0 BLASTING



- a) **Broad blasting parameters like charge per hole, blasting pattern, charge per delay, maximum number of holes blasted in a round, manner and sequence of firing etc.**

(i) **Charge/hole :**

Spacing	=	3.5 m
Burden	=	3.0 m
Depth	=	6 m
Bulk Density	=	2.8 t /cu.m

Total maximum material to be blasted per annum shall be = 468645 tons

Quantity broken/hole = 3 m x 3.5 m x 6 m x 2.8 tons / m³ x 80%
= **141 tons/hole**

Powder factor = 7.5 t/kg

Therefore, charge/hole = 141 t / 7.5 t/kg = **18.82 kgs**

The distribution of high explosives required @ 7.5 t/kg powder factor shall be
468645 / 7.5 = 62486 kgs

(ii) **Blasting Pattern:**

The holes shall be blasted in a multiple rows using m.s. delay detonators & non-electric detonators.

(iii) **Manner and sequence of firing:**

The holes shall be blasted using 25 m.s, 50 m.s. and 100 m.s. cord relays so that charge per delay would not exceed the permissible limits.



b) Type of explosives used/to be used:

High explosives of slurry cartridge of 83 mm shall be used as a prime charge. This forms 20% of the total charge, the balance 80% being Ammonium Nitrate fuel oil mixture.

62486 kgs/annum X 80% = 49989 kg Ammonium Nitrate/annum

62486 kgs/annum X 20% = 12497 kg Prime charge/annum

c) Powder factor in ore and overburden / waste / development heading / stope:

Powder factor shall be avg. 7.5 t/kg of explosives in the entire strata to be blasted.

d) Whether secondary blasting is needed, if so, describe in brief:

Secondary blasting will be very less as secondary rock breaker will be used after procurement.

e) Storage of explosives (like capacity and type of explosive magazine):

There will be a explosive magazine to store the explosives as shown in the land use plan.

6.0 MINE DRAINAGE



- a) **Likely depth of water table based on observations from nearby wells and water bodies:**

The depth of water table in shallow aquifer is 80m from the ground level (i.e. 770m RL). The regional water table is about 80m to 100m below the ground level (i.e. 750m RL).

- b) **The deepest workings expected to reach.**

The expected deepest mining operation shall be above +904 m msl, which will not touch the ground water table.

- c) **Quantity and quality of water likely to be encountered, the pumping arrangements and places where the mine water is finally proposed to be discharged.**

The ground water is not going to be encounters in this mining plan period

7.0 STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE :

- a) **Indicate briefly the nature and quantity of top soil, overburden/waste and mineral rejects like to be generated during the next five years:**

Waste to the extent of 3274754 tons is likely to be encounter in the first five years of the mining plan period. Out of that 205682 tonnes is going to be lateritic soil and 3069072 tonnes shall be other wastes like shale / phyllites and intercalated waste. An area to the extent of 2.00 Ha as shown in landuse plan is earmarked for soil stacking where as for other waste 5.5Ha area is earmarked. No mineral rejects are expected to generate in this first five years of the plan period.

The following table shows the generation of waste and their proposed disposal for the first five years of the mining plan

Year	Top Soil	Over burden	Mineral rejects
I - Year	127985	112398	-
II - Year	87837	581603	-
III – Year	22341	750398	-
IV – Year	15719	683315	-
V - Year	30239	862919	-

Soil (Tonnes)	Proposed Disposal	Waste (Tonnes)	Proposed Disposal
284121	1190 to 1350 N 1120 to 1280 E RL 855m To 870m	2990633	1000 to 1280 N 1495 to 1760 E RL 870m To 885m

Threshold values in respect of apatite and rock phosphate, bauxite, barytes, chromite, chinaclay/kaolin, fluorite, graphite, gypsum, iron ore, kyanite and sillimanite, limestone, manganese, magnesite, talc/steatite/soapstone, and wollastonite minerals as evolved by IBM may be adopted as applicable.



The cutoff grade for iron ore shall be 52% Fe.

b) Land chosen for disposal of waste with proposed justification.

The land chosen for dumping the waste and stacking the sub-grade are shown in the **Plate No 10**. The land chosen for waste dump is barren and falls outside the working pit limit.

c) Attach a note indicating the manner of disposal, and configuration, sequence of build up of dumps along with the proposals for the stacking of sub-grade ore to be indicated item wise.

The dumping shall be done in bench like configuration in an ascending order starting from the lower most levels. A retaining wall shall be constructed to check the rolling off or washing off silt. Toe-wall will be constructed at the foot of dump to arrest wash-off. The height of the waste dump shall be 15m with one sub bench of 7m. The angle of repose shall be 28⁰ The location of dumping area is shown in **Plate No - 10**.

The sequence of the waste dump management is given on the page No 42 of Environment management plan.

8.0 USE OF MINERALS



- a) Describe briefly the end-use of the mineral (sale to intermediary a parties, captive consumption, export and internal use).

The iron ore from this mine shall be sold to the domestic steel industry as well as that shall be exported to the china and Japan. The lowest grade also shall be sold to the local cement industries.

- b) Indicate the physical and chemical specifications stipulated by some of the buyers.

Buyer	Physical Comp	Chemical Comp
JSW Steels	-30mm +10mm	Fe >63%
	-10mm	Fe >62%
Cement Industry	-10mm	Fe >52%

- c) Give details in case of blending of different grades of ores is being practiced or is being practiced at the mine to meet specifications stipulated by buyers.

The blending shall be done as and when possible, as that is depends on the availability of the excess high grade iron ore.

9.0 OTHERS



Describe briefly the following:

a) Site Services:

Statutory buildings like office building, Rest shelters, first aid shall be constructed in a semi permanent construction using brick walls and tin sheet roofing. Drinking water is being provided in a well-maintained tank close to the rest shelter.

The following statutory and administrative facilities shall be developed at the mine site.

- a) Mine-cum-Time Office
- b) Quality Control
- c) Rest Shelter
- d) First Aid Station
- e) Latrines/Urinals
- f) Canteen
- g) Stores
- h) Water supply for drinking purposes

The above site services shall be provided at the mine in the area earmarked for statutory buildings.

b) Employment potential:

The list of the staff and workmen employed in the mine is given in organization chart. One full time I class and two II class managers cum mining engineer shall be employed as per the provisions 42 of MCDR, 1988.

Highly Skilled	:	11
Skilled	:	01
Semi-skilled	:	03
Unskilled	:	04
Total	:	19

Others shall be on contract basis through contractors.

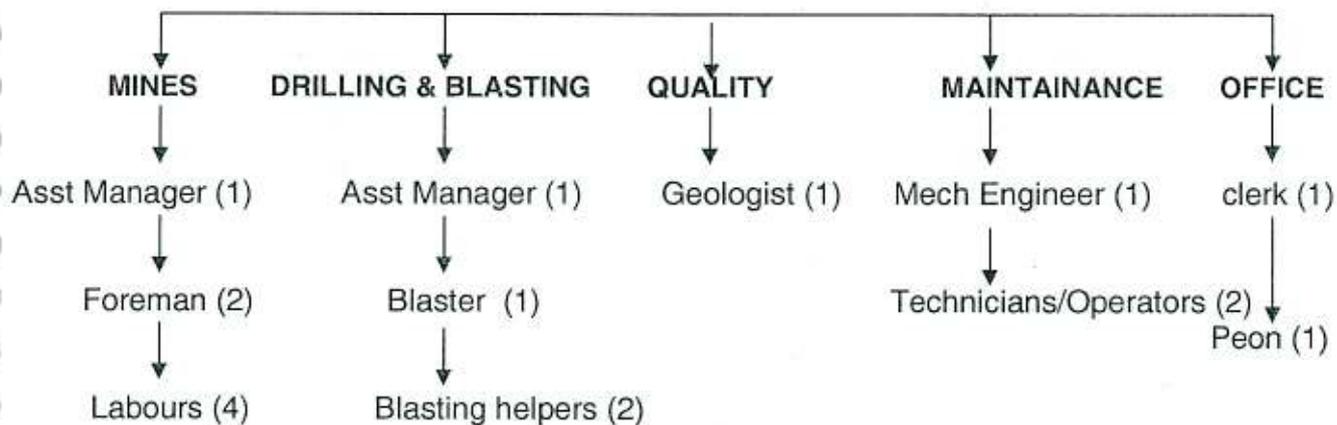


ORGANISATION CHART

General Manager (Agent)



Mines Manager cum mininig engineer (1)



Others shall be on contract basis through contractor.

10.0 MINERAL PROCESSING



- a) **If processing/beneficiation of the ore or minerals mined is planned to be conducted on site or adjacent to the extraction are, briefly describe the nature of the processing/beneficiation. This should indicate size and grade of feed material and concentrate (finished marketable product), recovery rate.**

There shall be two no of crushing and screening plant of 250 tonnes per hour capacity inside the lease area. The feed to the primary crusher shall be -200mm. There shall be two secondary crusher. The feed size to the secondary crusher shall be -50mm. the product size shall be -40mm to +10mm, 6 to 20mm and -10 mm. It is expected that 70 - 75% of the material shall be of -10mm and balance 25 – 30% shall be 10 to 40mm.

- b) **Explain the disposal method for tailings or waste from the processing plant (quantity and quality of tailing proposed to be discharged, size and capacity of tailing pond, toxic effect of such tailings, if any, with process adopted to neutralize any such effect before their disposal and dealing of excess water from the tailing dam).**

Not applicable

- c) **A flow sheet or schematic diagram of the processing procedure should be attached.**

Enclosed as Annexure VII

- d) **Specify quantity and type of chemicals to be used in the processing plant.**

Not applicable

- e) **Specify quantity and type of chemical to be stored on site/plant.**

Not applicable



- f) **Indicate quantity (cu.m per day) of water required for mining and processing and sources of supply of water. Disposal of waste water and extent of recycling.**

The total water requirement in the mine is given below.

Purpose	Qty Required
Drinking water	1.0 KLD
Afforestation	4.0 KLD
Dust suppression	50.0 KLD
Total	55.0 KLD

The water shall be drawn from the private bore wells out side the lease area.

11.0 ENVIRONMENT MANAGEMENT PLAN



- a) **Attach a note on the status of baseline information with regard to the following:**

Baseline data in respect of Air, Water, Noise and Soil in the 10 kms radius of buffer zone area has been collected for winter season 2007 and enclosed vide **Annexure VI.**

Existing land use pattern indicating the area already degraded due to quarrying/pitting, dumping, roads, processing plant, workshop, township etc., in a tabular form.

This is a virgin area and the existing land use pattern of this area is given below.

Particulars	Present land use (Ha)
Area for Mining	0.2
Area for Roads	0.8
Untouched Area	71.15
Total	72.15

- **Water regime**

There is no perennial source of water in the vicinity of mine. The perennial water source is tube well / bore well. Samples were collected from available source around the mine and analysed. The detail test report is given in Annexure-VI

- **Flora and Fauna**

The Flora in the study area generally consists of Neem, Tamarind, Guava & Chikku. There is no forest area falling around the mining lease area. The entire lease area is covered by Agricultural lands, cultivated for sunflower, cotton, Jawar etc. the approximate yield per Hectare is as follows

TYPE OF CROP	RAIN BASED	IRRIGATED
Sunflower	8 –10 Qt/Ha	13- 15QT/Hect
Maiz	8 – 10 Qt/Ha	15- 20QT/Hect
Jawar	6 – 8 Qt/Ha	10- 15QT/Hect

Apart from the above natural vegetation, grass growth during the Monsoon season can also be noticed, which fades away with the onset of summer leaving only thorny bushes.

Fauna:- Regarding Fauna of the area, the following species has been noticed.

- a) Crow
- b) Cobra
- c) Monkey
- d) Mangoose
- e) Rat

The fauna found in this area of common variety and no “Endangered Species” have been sighted in the area.

- **Quality of air, ambient noise level and water**

1. **Ambient air quality**

Ambient air quality data with respect to SPM, SO₂ and Nox were collected from the core zone and buffer zone. Samples were collected using high volume air samplers following the standard analytical procedures. The Ambient Air Quality (AAQ) analysis was carried out during the post monsoon season. The samples were collected at a frequency of two samples per day for twice a week and two times in a season. The location of these sample stations is shown on the environment plan and Key plan.

In core zone the suspended Particulate Matters (SPM) values in core zone varied between 86.0 to 169.0 µg/m³. Whereas SO₂ and Nox varied between 6.9 to 11.3 µg/m³ and 8.2 to 12.5 µg/m³ respectively.

In buffer zone the SPM values varies between 86 to 197 µg/m³, where as SO₂ and NO_x is less than 18.4 µg/m³. Occasionally high SPM was recorded due to unmetalled roads.



The ambient air quality location are given below :

- CA1 - Applied Lease area
- BA2 - Hosahalli village
- BA3 - Bullenahalli village
- BA4 - Yerekatte village
- BA5 - Katurikihalli village

Environmental monitoring report enclosed vide **Annexure - VI**

2. **Noise levels :**

Noise level in the core zone was in the range of **44.2 to 66.8 dB(A)** The main source of noise on the area was breezing wind.

The noise level in the buffer zone ranging from **37.92 to 60.1 dB(A)**

3. **Water Quality :**

Two water samples were collected in buffer zone area. Both the samples are ground water samples. In buffer zone area the pH values are ranging from 7.5 to 7.9, the dissolved solids and hardness are ranging from 372 to 458 and 126 to 153 mg/lit. Water analysis report is enclosed vide **Annexure - VI**

- **Climatic conditions:**

The climate of the area is Semi- Arid. The area gets normal rainfall of 400 to 600mm per annum & exhibits variations of temperature with summer & moderate winter. The temperature recorded indicates the highest temperature as 44⁰C & lowest 22⁰C.

- **Human settlement:**

There is no human settlement in the lease area.

- **Public buildings, places of worship and monuments:**

There is no monuments of either historical or archaeological importance in the core or buffer zone.

- **Attach plans showing the locations of sampling stations:**

The location of sampling stations are selected for monitoring, are shown in key plan vide Plate No.1. All monitoring stations are located in core zone and buffer zone villages.

b) **Attach an Environmental Impact Assessment Statement describing the impact of mining and beneficiation of environment on the following over the next five years and up to conceptual plan period 'A' category mines.**

i) **Land area indicating the area likely to be degraded due to quarrying, pitting, dumping, road, workshop, processing plant, township etc.**

Mining activity certainly will have its effects on the different environmental parameters.

The mining is proposed to be done scientifically and also the waste / soil shall be systematically stacked. The afforestation program coupled with engineering measures such as check dam, gully checks, terracing, and suitable drains shall mitigate any impacts. There may not be any impact either on land use or on agricultural activities with in buffer zone due to this mining.

As on now due to lack of exploration data it is difficult to give closure to accuracy details regarding land use at the stage of conceptual, however tentative details are incorporated in the conceptual plan enclosed vide Plate No - 8.

The pit at the conceptual stage shall be worked up to the +904m RL. Later part of the area shall be made available for back filling after obtaining permission from IBM. The conceptual section of this pit is enclosed vide Plate No -9.

The ultimate landuse plan (the land degraded due to mining and other allied activities till the end of mine) is given below.

Particulars	Ultimate land use in Ha.
Area for Mining	15.00
Area for Dumping	7.50
Area for Green belt	3.40
Area for Roads	3.00
Area for Crushing and screening plant.	2.20
Area for Top Soil management	2.00
Area for SGMD	2.00
Area for Infrastructure	0.20
Afforestation / unused area	36.85
Total	72.15



ii) Air Quality

The ambient air quality is likely to be deteriorated to certain extent due to the proposed mining consisting of drilling, blasting, loading and unloading and transportation. Compared to the existing air quality in the core zone, the SPM levels and the gaseous pollutants like SO₂, NO_x and CO etc., are likely to increase at the work spot. However, the effect of mining operations on the ambient air quality may not be significant since no villages are situated within 2.0 kms distance from the mining operations. All the environment measures to control air pollution shall be undertaken, so that the pollution scenario due to the mining activities shall be marginal and insignificant

iii) Water Quality

The quality of mine discharged water dose not contains any toxic elements. However, from the mines working under similar conditions show that total suspended solid lead to siltation of the near by streams.

iv) Noise Levels

Presently the noise level in the core area is the range of 44.2 to 66.8 dB(A). With the present method of mining there shall be increase in the noise level. However as there is no human settlement within 2 to 3km radius, the impact of mining on the ambient noise level shall be hardly noticeable.

**v) Vibration levels (due to blasting)**

The vibration due to blasting shall be controlled by controlled blasting by using m.s. delay detonator. However the study shall be conducted to study the vibration levels through from the reputed consultants and the company shall implement the recommendations.

vi) Water Regime

Surface Water: Iron ore mining operation does not dispose off any effluent in the surrounding watercourses. Hence surface water is not going to be affected either qualitatively or quantitatively. As the area does not receive normal rainfall, there is hardly any possibility of siltation of the seasonal streams during the rainy season.

Ground Water: The mining operations are confined to +982m RL the surface, which is above ground water table. Therefore these mining operations on the hill slopes may not have any adverse impact on either the yield or movement of ground water.

vii) Socio-economics

i) Social and demographic profile : The mine is situated in the remote place area, where the socio- economic level of the people is not satisfactory.

The main occupation of the people is rain depended farming. Due to uneven topographic condition and low fertility of the soil the agricultural out put is comparatively low and there are no major industries in the area. This might have forced the local people to migrate towards the cities.

The mining operation in such remote places would provide direct and indirect employment to more than 90 local people. Hence mining operation will help in improving socio-economic status of the area.

- ii) Occupational health and safety hazards: magnetite does not contain any toxic elements. Hence the possibility of any health hazards are minimum.
- iii) Human settlement: There is no human settlement within 2.0 km radius of the mine. Hence no adverse impact would be noticed on the near by settlement.
- iv) Recreation facilities: As the area is devoid of any industrial development, no recreational facilities are available. After completion of mining activities due to greenery & other infrastructures, the area may develop into a good picnic spot

viii) Historical monuments etc

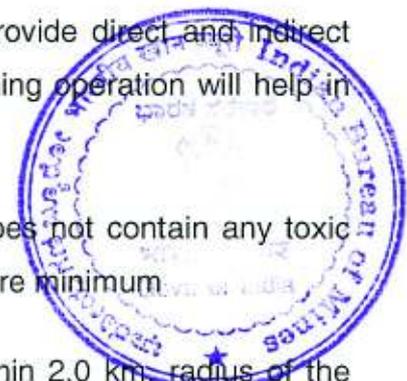
There are no historical monuments in the core or buffer zone.

- c) **Attach an Environmental Management Plan (supported by appropriate plans and sections and time-bound action proposed to be taken with sequence & timing in the following diagrams should be used).**

- Temporary storage and utilisation of top soil.

205682 tonnes lateritic soil shall be generated in the first five years of the mining plan. These soils shall be stacked in the earmarked area of 2Ha. This shall be used for developing the green belt and afforestation on the waste dump.

- **Year wise proposal for reclamation of land affected by abandoned quarries and their mining activity during first five years (and up to conceptual plan period for 'A' category mines, clarifying to extent back filling and re-contouring and/or alternative use of unfilled/partially filled excavations to sides/slopes and mine.**



Year	Soil (Tonnes)	Site For disposal	Waste (Tonnes)	Site For disposal
1 st to 5 th year	265682	1190 to 1350 N 1120 to 1280 E	3274754	1000 to 1280 N 1495 to 1760 E
6 th to 10 th year	Nil	1190 to 1350 N 1120 to 1280 E	4000000	1000 to 1350 N 1300 to 1850 E
11 th to 15 th year	Nil	1190 to 1350 N 1120 to 1280 E	1188703	Back filling at section AA
Total	265682		8463457	

The degraded lands due to various mining operations within the lease area need restoration or reclamation by taking up suitable management methods.

In the first five years of mining plan period, totally 12.70 Ha area shall be used for mining and 5.5 Ha proposed for dumping and 2.0 Ha proposed for sub grade mineral and mineral stack. All put together 28.35 Ha area shall be broken for mining and allied activities in the first five years of mining plan period.

At the end of the mine, the exhausted pit on section AA' shall be backfilled where as balance mined out pit shall act as pond storage. A conceptual plan enclosed vide Plate. No 8 and an environmental plan is enclosed vide Plate. No.11.

The following measures are suggested for bringing back the lease area to near original or better land use.

- a) Green belt
- b) Areas to be dumped
- c) Reclamation of mined out areas.

a) Green belt:

Planting a suitable combination of trees that can grow fast and also have good leaf density shall be adopted to develop the green belt. It will act like a buffer to trap the airborne dust and also reduce the noise levels. From the aesthetic point of view also, this will have a positive impact.

In the mining project it is proposed to develop a green belt of 7.5 meters width all along the boundary of the mining lease area. The green belt shall be developed in consultation with the local forest authorities, for selection of specific species, seedling management, and plantation techniques and to up keep up by deweeding, manuring and regular watering.



b) Area to be dumped temporarily:

During this mining plan period about 3274754 tons of waste shall be dumped in 5.5 Ha earmarked area as shown on landuse plan in a bench like manner in an ascending order. This helps in the lower slice being consolidated and stabilized using retention wall. The slopes are afforested using grass and ageva. The topsoil shall be suitably spread on the top of the waste material to ensure good growth.

c) Reclamation of Mined out Areas:

The mined out pit need reclamation. The mineral bearing area will be mined out up to ultimate depth by maintaining proper bench height and width. After completion of mining operations and even after backfilling, the part of mined out pit, shall remain unfilled, which shall be converted in to a pond. The rainwater will be collected continuously in the pit and percolate in to the ground. The top benches shall be afforested with local grass and plants. A conceptual plan is enclosed vide Plate. No 8.

- **Programme for afforestation, year wise for the initial five years (and up to conceptual plan of 'A' category mines) indicating number of plants with name of species to be demarcated in areas in hectares.**

During the Plan Period of mining plan it is intended to plant a minimum of 500 saplings every year. This shall be undertaken all along the lease boundary as a green belt development and earmarked area for afforestation.

It is proposed to have a green belt around the ultimate pit limit to protect the surrounding area around the mining lease from the dust and sound. For this purpose proper species of plants will be selected. They shall have deep roots,

fast growth and optimum penetrability. To stand firmly against the wind. The species of plants, which forms the dense vegetation and maximum canopy, shall be selected.

The year wise plantation program along with location is given below.

Year	No of Plants	Location	Species
1 st year	500	All along the 7.5m Buffer area	Neem, tamrind, Fruits bearing trees and bio fuels species
2 nd year	500	All along the 7.5m Buffer area	Neem, tamrind, Fruits bearing trees and bio fuels species
3 rd year	500	All along the 7.5m Buffer area	Neem, tamrind, Fruits bearing trees and bio fuels species
4 th year	500	All along the 7.5m Buffer area	Neem, tamrind, Fruits bearing trees and bio fuels species
5 th year	500	All along the 7.5m Buffer area	Neem, tamrind, Fruits bearing trees and bio fuels species

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.

Stabilisation and vegetation dumps along with waste dump management for next five years (and up to conceptual plan period for 'A' category mines).

The waste dump is proposed to be stacked on the 5.5 Ha of barren pre-determined dumping area. The dumps shall have a retaining wall. Grass species and legumes and agave plantations shall consolidate the dump slopes and tops.

1. The top layer of the dump material and slopes shall be covered with top soil which has excellent property of water retention that supports good tree growth.
2. The tree species shall be of indigenous stock and thus in line with the biodiversity of the area. The seedlings shall be planted raised in nursery of the Forest Department and as guided by the Forest Department officials.

3. A green belt development on waste dump shall be taken up simultaneously. This helps in afforestation in the lease area, but also prevents soil erosion and consequent silting of local water streams.
4. Grass species like Hemata shall be propagated to bind the loose particles on the slopes.
5. Use of good root bearing and hardy species like Agava, shall be planted in the contour trenches at closer intervals.



- **Measures to control erosion/sedimentation of watercourses:**

- To prevent direct impact of rain on soil erosion, close plantation on dump with 2 - 3 m plants to plant distance shall be maintained for the plants to grow profusely and its crown acts as barrier during rainfall on the dumps. Plantation of draught resistant species of Agave and Sesbania shall be planted.
- The dumps erode and form small gullies, due to water action, which lead to the transportation of silt. In such cases these small gullies shall be plugged with rubble followed by ageva plantation.
- Retaining and protective walls at the bottom of the dumps would be constructed. After terracing and leveling of these dumps, suitable plant species would be grown.
- Areas that are likely to get affected are prone to soil erosion and surface water runoff results in movement of soil particles, which would be prevented by employing adequate corrective measures. Soil erosion shall be reduced considerably by constructing check dams at suitable sites and elevations. Gully checks in series would be constructed to arrest wash off solids.

- **Treatment and disposal of water from mine:**

Excepting during monsoon months, no water is encountered.

- **Measures for minimising adverse effects on water regime:**

Since this deposit is located on the general ground level there shall not be any affect on ground water table.

The water that would be encountered in the project is rainwater. During the rainy season, water flowing through the mine and dump is likely to carry some silt along with it, to guard against this, the following measures shall be adopted.

- Formation of water garland to regulate and drain the rain waters from the quarry and directs its course away from the dumping areas.
- The dump is designed to have reverse slopes so that rainwater does not flow through the dump slopes.
- Providing sufficient gully checks & check dams to check any silt flowing along with the surface run-off in the valleys
- Provision of retention walls at the foot of the dumps.

- **Protective measures for ground vibrations/air blast caused by blasting:**

All the villages are situated more than 2.0 kms away from the mine. However the following measures shall be undertaken,

- Proper charge per delay regulated.
- M.S. delay detonators or sequential blasting exclusively used.
- Stemming column shall be more than the burden to avoid blown out shots.
- Each blast is carefully planned, supervised, executed and observed.
- To reduce the fly rocks, vibrations, Noise control the Raydet/Excel (nonel) are used.

- **Measures for protecting historical monuments and for rehabilitation of habitat, settlements, disturbed due to mining activity:**

No historical monument is involved within this applied lease area.

- **Socio-economic benefits arising out of mining:**

Spurt in industrialization and mining activities have invariably brought a drastic change in the environment including the society connected with region. Mostly remote areas tucked away from urbanization and influence of modern civilization fall within the limits of mine development. A natural corollary to this the socio economic aspects of the local inhabitants who have dwelling this region for generations, get suddenly and probably a radical change, consequent to their abrupt exposure to the mining activities.



The impact of this mining project will be positive. The subject-mining project provides employment for about 90 persons (19 directly for mining operations and balance indirectly through contractor for maintenance and operating the machineries and lorries, for plantation & environment measures and statutory obligation) and also creates in the service sector for an equivalent number of persons will be indirectly employed in the other allied activities. Thus a population of about 450 persons can sustain their lively hood on this project. There is no proposal for displacement of any person in this project. Majority of the work force shall be local people coming from the villages with in the district.

The local people will get employment opportunities, better medical and educational facilities etc., mainly due to the mining operation from this project. In addition to this the literacy rate and better living standards shall increase due to the enhanced earning capacity of villagers. This area will also have better Medical, Educational, Transportation and communication facilities, which are also directly, linked with the establishment of the mining project.

In the buffer zone villages, this project will be one of the major economic activities resulting in generation of revenues to the State and Central Governments, by way of Royalties, Taxes, Central Excise etc., The living condition of the persons shall improve, thus contributing to the overall up gradation of living standards. There would tremendous earning of foreign exchange due to export of value added products instead of raw material alone from this region.

The socio-economic parameters of the area undergo change due to :



- A spurt in the economic activities in the area
- Changes in the employment pattern of the area
- Changes in the pattern of facilities available, both in respect of the infrastructure facilities as well as other services.
- Improvements in money supply in the area through better earning capacity of population.

In general the impacts will be positive in nature since the investment from this project will have a fairly high spin off. The economic activities in the area not only from the money supply but also from the increased pace of industrialisation of the area with linkages on the two sides. Benefits that result will be :

Higher employment potential of the area.

- Higher infrastructure facilities that will come up in areas around; roads, communication network etc
- Better health care for the locality, as facilities available with the mine can become available to the community including special camps to be arranged.
- Better admixture of cultures will result in preservation of the cultural heritage of the area and also will result in better appreciation of different cultures of the people from such diverse areas/localities. The company in the field of socio-economic upliftment has done commendable contribution.

d) Monitoring schedules for different environmental components after the commencement of mining operations and related activities (for 'A' category mines only):

For this mining project a regular monitoring mechanism for various environmental parameters shall be evolved as per the guidelines issued by Ministry of Environment & Forests, New Delhi.

PART III

12.0 PROGRESSIVE MINE CLOSURE PLAN



The Progressive Mine Closure Plan is prepared, as components of Mining Plan vide Notification No. G S R 330 (E) dated 10.04.2003, of Mineral Conservation and Development Rules, 1988. The guidelines issued by Indian Bureau of Mines have been followed:

1.0 Introduction

- (a) **Name of the Lessee** : M/s. Mineral Enterprises Limited
(b) **Location of the area** :

The area falls in the Gollarahatti Village, C N Halli Taluka, Tumkur District, Karnataka State.

The latitude and longitude of the area is given below.

Longitude : 76°40'10" to 76°41'30"

Latitude : 13°25'00" to 13°25'30"

A location plan is enclosed vide **Plate No. 1**.

- (c) **Extent of the area** : 72.15 Ha
(d) **Type of the lease area** : Govt Revenue land
(e) **Present Land Use Pattern** :

The present land use pattern is shown in the below table.

Type of Activity	Area in Ha
Area excavated	0.20
Roads	0.80
Area remains untouched.	71.15
Total	72.15



(f) Method of Mining

Conventional Opencast method is opted by mechanized mode of operation.
Kindly refer Chapter 4.

(g) Mineral Processing

There is no mineral processing involved. With in the lease area

1.1 Reasons for closure

Not Applicable

1.2 Statutory Obligations

Nil

1.3 Closure Plan Preparation:

Applicant : M/s Mineral Enterprises Limited
300/1B, 16th Cross
Sadashivanagar
Bangalore - 560 008

Name and Address of the RQP:

Dr. D.N.Gulhane Key person	S.Kameswara Rao Authorised signatory
Reg. No. :RQP/BNG/242/2007/B RQP Validity up to 4 th March, 2017	
Global Environment & Mining Services "Devikanandan" Opp PLD Bank, Patel Nagar Hospet – 583201. Bellary Dist. Karnataka, India Ph : 08394 – 329294 / 223755 Fax: 08394 223755, Mobile : +919449830533 / +919448479433	

Executing Agency : Lessee.



2.0 MINE DESCRIPTION:

2.1 Geology:

Regional geology

PI refer Chapter 3.

Local Geology

PI refer Chapter 3.

2.2 Reserves

The reserves of the said mine is discussed in para Geological Reserves in the chapter 3. Geology & Exploration.

2.3 Mining Method:

The details about mining methods are given in chapter 4. Mining

2.4 Mineral Beneficiation:

No mineral beneficiation is proposed.

3.0 REVIEW OF IMPLEMENTATION OF MINING PLAN / SCHEME

3.1 Name of Mine : Applied Mining Lease Area (Sarangpani Iron & Manganese Ore Deposit) of M/s Mineral Enterprises Limited

3.2 Particulars of the Approved Mining Plan/ Scheme

This is the first mining plan

3.3 Date of commencement of Mining Operations.

Not yet Commenced

3.4 Review of Compliance Position of Mining Plan / Scheme

3.4A Deficiencies, if any, that existed in the Approved Mining plan / Scheme to be taken note of and rectified by incorporating suitable proposals for implementation in the scheme of mining:

Not applicable

3.4B Review of compliance Position of salient features of the Mining Plan / scheme on chapter wise basis bringing out marked deviations, if any, any justifications / reasons there of.

Exploration : Not applicable

Mine development & Exploitation : Not applicable

Plantation Progremme : Not applicable

Land Reclamation & rehabilitation : Not applicable

Waste Management : Not applicable

Quality of Air : Not applicable

Noise Level : Not applicable

Ground Vibrations : Not applicable

Quality of water : Not applicable

As the mining has not started, it is not applicable.

3.4C Review of compliance of conditions and stipulations imposed, if any, while approving Mining Plan / Scheme. In case non-compliance, partial compliance justification reasons thereof may be furnished along with proposal for compliance in ensuring period.

Not applicable

3.4D Review of compliance of violations pointed out after inspections made under MCDR, 1988 during the last five years.

Not applicable

3.4E Any other points requiring attention in the interest of proper mine design Development, conservation and Ecology of the area.

Not applicable



4.0 Progressive mine closure Plan

4.1 Mined out land.

The details of the present & up to ensuing mining plan period is tabulated in below table.

Type of Activity	Present	At the end of Plan period
Area excavated	0.20	10.00
Storage of top soil	0.00	2.00
Overburden / dumps	0.00	5.50
Mineral storage / SGMD	0.00	2.00
Infrastructure (Workshop, office)	0.00	0.20
Roads	0.80	3.00
Railways	0.00	0.00
Green Belt	0.00	0.75
Tailing pond	0.00	0.00
Effluent Treatment Plant	0.00	0.00
Mineral Separation Plant	0.00	2.20
Township Area	0.00	0.00
Others (to be specified)	0.00	0.00
Agricultural fields	0.00	0.00
Area remains untouched.	71.15	46.50
Total	72.15	72.15

There shall not be any reclamation of the mined out area in the first five years of the mining plan as at no place ore shall be going to exhaust. However at the conceptual stage the exhausted pit area on section A – A' shall be back filled with the generated waste. All the waste dump shall be stabilized and afforested. The exhausted pit at section B-B' to D – D' shall be converted in to the rain water pond, where physiculture shall be proposed. All the pits and working shall be properly fenced and afforested all around at conceptual stage.

4.2 Water quality management:

Surface water

There are no water bodies with in the lease area. During the monsoon entire storm water flows down through water courses.

To check the erosion and prevent silt being carried during monsoon period, a series of gully checks would be constructed at regular intervals. Garland drains on the upper side of workings would be dug to prevent entry of runoff into mine

workings. The dumps will be stabilized and afforested with good root bearing species like agave and hemata grass on dump slopes.

Ground water:

As the working is at higher elevation than ground water level there is hardly chance of encountering the same during mining. So there is no water pollution due to discharge of water during monsoon.



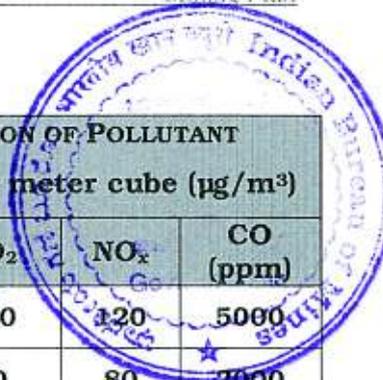
4.3 Air quality management:

The ambient air quality is likely to be deteriorated to a certain extent due to the proposed mining and transportation. Regular spraying the water on haulage road and working areas will maintain the dust level well below the permissible limits.

The air quality status for post monsoon season in buffer zone areas is given below.

Unit : $\mu\text{g.m}^3$

	Pollutants	SPM	SO ₂	NO _x
Core Zone	Min.	93	7.80	8.70
	Max.	151	10.80	12.60
Hosahalli Village	Min.	89	7.80	8.70
	Max.	143	10.80	12.60
Bullenhalli Village	Min.	95	8.30	9.20
	Max.	147	11.60	12.20
Yerekatte Village	Min.	91	8.10	8.80
	Max.	152	11.20	12.70
Katurikihalli	Min.	98	8.2	9.5
	Max.	137	10.3	11.6

National Ambient Air Quality Standards


CATEGORY	AREA	CONCENTRATION OF POLLUTANT Micrograms per meter cube ($\mu\text{g}/\text{m}^3$)			
		SPM	SO ₂	NO _x	CO (ppm)
I	Industrial and Mixed-use	500	120	120	5000
II	Residential and Rural	200	80	80	2000
III	Sensitive	100	30	30	1000

The values of SPM, RPM, SO₂, NO_x, monitored at all locations are well within the NAAQ Standards

The environmental control measures, which are proposed to be continued to control the fugitive dust released due to production are given below.

Mines

- Dust suppression systems (water spraying) would be adopted at mine working and loading points.
- Dust extraction systems would be used in drill machines;
- Use of sharp drill bits for drilling holes and drills with water flushing systems (wet drilling), to reduce dust generation
- Use of delay detonators and shock tube initiation system for blasting so as to reduce vibration and dust.
- Avoiding blasting during high winds periods and temperature inversion periods.
- Excavation operations would be suspended during periods of very strong winds.
- Afforestation for control of dust.
- Plantation of wide leaf trees, creepers, tall grass along approach roads, and on safety barrier zones to suppress dust.

Haulage

- Regular water spraying on the haulage roads during transportation of ore by water sprinklers. Water shall be collected at the perennial spring in the lease area.
- Covering every loaded truck with tarpaulin covers.
- Transfer points shall be provided with appropriate hoods/chutes to prevent dust emissions.
- Dumping of waste shall be done from an optimum height (not too high) so as to reduce the dust blow.
- Avoiding over filling of tippers and consequent spillage on the roads.



4.4 Waste Management:

The waste management discussed under the chapter- 7,

4.5 Top Soil Management

It is discussed in chapter 7.

4.6 Tailing Dam Management

Not applicable

4.7 Infrastructure.

The lessee shall provide infrastructure facilities like office, Canteen, rest shelters, drinking water, Medical facilities, transport and others.

4.8 Disposal of Machinery

It is proposed to hire all the machineries through contractor. Contractor shall withdraw all the machineries after closure of the mine.

4.9 Safety & Security:

At the end of the mining operations the total area excavated will be fenced properly with single opening for workers engaged in closure plan work. A stone barrier/toe wall will be made all around the waste dump on dip side to prevent

waste dump material being carried out of the dump area and mixing up with the general drainage system of the area.

4.10 Disaster Management & Risk Assessment:

The complete proposed mining operations will be carried out under the Qualified Mines Manger. Directorate General of Mines Safety (DGMS) will issue a number of standing order, model standing orders and circulars to be followed by the mine management in case of disaster.

Moreover, mining staff would be sent for refresher courses from time to time to keep them updated with the latest on safety aspects.

However, following natural / industrial hazards may occur during mining operation:

- Slope failures at the mine faces.
- Accident due to explosives.
- Accident due to heavy mining equipment.

In order to avoid the above disasters the following control measures shall be under taken:

- Checking and regular maintenance of garland drains and bunds to avoid build – up of water in the mine pit.
- Safety precautions and provisions of Metalliferous Mines Regulations 1961 are strictly followed during mining operations.
- Entry of unauthorized persons in to the mine will be prohibited.
- Fire fighting and first aid materials will provide in the mine office and mining area.
- Safety appliances such as safety boots, helmets, goggles and earplugs will provide to the employees and regularly checked for their proper use.
- Mine will be worked as per approved Mining Plan.
- Regular maintenance and testing of all mining equipment as per manufacturer's guidelines.



- Water spraying will be done for suppression of dust on the haulage roads.

For handling any type of disaster situation, a rescue team will be formed by specialized training of a selected group of mining personnel. No high risk accidents are anticipated as the project is an open cast mining operation in a fairly stable area free from land subsidence, earthquake etc. No tailing dam is proposed and there is no associated risk. However, in case of any eventuality the following person will be available for contact.

Name and address of contact person

Shri Basant Poddar

M/s Karnatak Mining Company Pvt Ltd
300/1B, 16th Cross, Sadashivanagar
Bangalore – 08
Ph No : 080 41328074

In case of emergency the location of the nearest police station, Hospital and fire brigade station is given in the table shown below.

Fire brigade	Police Station	Hospital
C N Halli 8km	C N Halli 8km	C N Halli 8km

4.11 Care and maintenance during temporary discontinuance:

All the provisions as per the Mines Act 1952 shall be strictly adhered during temporary discontinuous.

5.0 Economic repercussions of closure of mine & manpower retrenchments.

This project would be operated by both permanent and temporary manpower through Contractors. The contractors will engage this manpower in other running projects after the completion of mining operations. However, a suitable compensation package would be drawn out at the end of the mining operations as per the existing laws of the land upon mine closure.



6.0 Time Scheduling of Abandonment:

This will be submitted in the Final Mine Closure Plan.

7.0 Abandonment Cost:

It is necessary to include the environmental cost as a part of the budgetary cost component. The project authorities propose to undertake the following environmental works to achieve the environmental quality as desired. It is proposed to take up environment protective measures like construction of 25 number of gully plugs, garland drain and retaining walls near the toes of the dumps

INITIAL/ CAPITAL INVESTMENT FOR ENVIRONMENTAL PROTECTION

SNo.	Particulars	No.	Cost (lakh Rs.)
I	POLLUTION CONTROL		
2	Water sprayer (Mobile)	1	16.00
3	Gully checks	25	0.25
4	Garland drains/ cheak Dam	LS	1.00
5	Drains along roads	LS	1.00
6	Retaining wall	LS	0.50
7	Check dams	1	1.00
	Total		19.75
II	POLLUTION MONITORING		
1	High volume air sampler	2	1.20
2	Respirable dust sampler	1	0.80
3	Micrometeorological Station (semi auto)	1	2.00
	Total		4.00
III	OCCUPATIONAL HEALTH		
1	Fire fighting equipment (Portable)	LS	0.20
2	Fire fighting equipment (Fixed)	LS	0.20
3	Fire fighting equipment (Mobile)	1	0.20
4	Personal protective equipment (for 60 employees)	60	0.50
	Total		1.10

IV	RECLAMATION		
1	Dozer (Hired)		1.0
V	MISCELLANEOUS		
1	Preparation of EIA/EMP report	LS	8.00
Total			8.00

Annual cost of monitoring and implementation of control measures is given below:

RECURRING ANNUAL COST FOR ENVIRONMENTAL PROTECTION

Sl. No	Particulars	Cost (Rs. lakhs)
1	Pollution control	12.00
2	Pollution monitoring	6.00
3	Occupational health	2.00
4	Green belt	2.00
5	Reclamation	2.00
6	Others (EIA/EMP, fencing, regeneration & maintenance of safety zone, compensatory, afforestation, expert advice etc.)	5.00
Total		29.00

The annual cost for environment protection / environmental improvement works is envisaged as Rs. 29 lakhs and the specific environmental protection cost per year is nearly Rs 1.64 /- per tons of iron ore produced.

8.0 Financial assurance:

Financial assurance has been calculated as per CCOM's circular No. 4/2006. The bank guarantee of Rs. 708750/- shall be given towards 28.35 Ha to be broken up area for the first five years of the mining plan, after execution of the lease. The detail breakup of the land required for mining and mining allied activities are given below and shown in the progressive mine closure plan enclosed vide plate No 12.

Sl. No.	Head	Area Put On Use at start of plan (In Ha)	Additional requirement during plan period (In Ha)	Total (in Ha)	The area considered as fully reclaimed and rehabilitated (in Ha)	Net area considered for calculation (in Ha)
1	Area under mining	0.20	12.70	12.70	12.70	12.70
2	Storage of top soil	-	2.00	2.00	-	2.00
3	Overburden / dump	-	5.50	5.50	-	5.50
4	Mineral storage/SGMD	-	2.00	2.00	-	2.00
5	Infrastructure (work shop, admn building etc)	-	0.20	0.20	-	0.20
6	Roads	0.80	2.20	3.00	-	3.00
7	Railay	-	-	-	-	-
8	Green belt	-	0.75	0.75	-	0.75
9	Tailing pond	-	-	-	-	-
10	Effluent treatment plant	-	-	-	-	-
11	Mineral separation plant	-	2.20	2.20	-	2.20
12	Township area	-	-	-	-	-
13	Others to specify	-	-	-	-	-
	Total	1.00	28.35	28.35	-	28.35
	Virgin area	71.15	-	46.50	-	48.30
	Total Lease area	72.15	-	72.15	-	72.15

9.0 Certificate:

Enclosed.

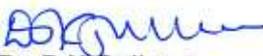
10.0 Plans & Sections:

Plans and sections are enclosed.

This Mining Plan is approved subject to the conditions / stipulations Indicated in the Mining Plan approval

letter No. ...MP/IRMS/ESPM-231-52
Date...16/2/2009

Global Environment & Mining Services


Dr. D N Gulhane
RQP/BNG/242/2007/B
Key Person


S Kameswara Rao
Authorised Signatory


Controller of Mines (sz)
खान निबंधक (द.ऑ.)
Indian Bureau of Mines
भारतीय खान ब्यूरो
Bangalore / बंगलूर



ANNEXURES

“True copy of Translated version from Kannada to English”



GOVERNMENT OF KARNATKA

No. DMG: MLS/233 AML – 99/07-08/10437

Office of the Director
Department of Mines & Geology,
Khanij Bhavan, Race course Road,
BANGALORE – 560001,
Dated: 18 Oct 2007

To,

M/s. Mineral Enterprises Limited
602, A/S, 18th Cross
Sadashiva Nagar
Bangalore - 80

2-11-07

Sub: Application for mining lease dated 10.08.99 for iron ore and Manganese over an extent of 72.15 Ha (178.30 Acres) from M/s. Mineral Enterprise Limited in Gollarahatti village, C.N.Halli Taluk, Tumkur Dist.,

Ref: Application No.233 AML 99 dated 10.08.1999

With reference to the above, we are herewith informing you to submit the following document to process your application.

1. Approved Mining plan in triplicate from Indian Bureau of Mines 178.30 Acres.
2. Consent from Karnataka State Pollution Control Board.
3. Government of India, MOEF clearance
4. Consent letter from Forest Environment and Ecology Department.
5. Clearance as per Environment Protection Act 1986

Yours faithfully

Sd/-

for Director

ಕರ್ನಾಟಕ ಸರ್ಕಾರ

ಸಂಖ್ಯೆ:ಗಭೂಇ:ಗಗುಶಾ/ 233 AML-99 /07-08/ 10437

ನಿರ್ದೇಶಕರ ಕಛೇರಿ

ಗಣಿ ಮತ್ತು ಭೂ ವಿಜ್ಞಾನ ಇಲಾಖೆ,
ಸಂ.49, ಖನಿಜ ಭವನ, ಕೋಣೆ ಕೋರ್ಸ್ ರಸ್ತೆ,
ಬೆಂಗಳೂರು-560001, ದಿವಾಂಶ: 10.8.99



ಶ್ರೀ
ಮೈ. ಮನಕಲ್ ಎಂಪಲಾಕ್ಮೆಂಟ್,
ಸಂ. 602, AFS, 18th ಮೈನ್ ಕ್ರಾಸ್,
ನವೀಕರಣ ನಗರ,
ಬೆಂಗಳೂರು - 56.

ಹೆಸರು,

ವಿಷಯ: ಗಣಿಗುತ್ತಿಗೆಗಾಗಿ ದಿನಾಂಕ: 10.8.99 ರಂದು ಶ್ರೀ ಮೈ. ಮನಕಲ್ ಎಂಪಲಾಕ್ಮೆಂಟ್-
ಪ್ರಾ.ಸಂ. ರವರು ಮೈ.ಮನಕಲ್ ಜಿಲ್ಲೆಯ ಶಿಕ್ಷಣ ಪ್ರಾಂಶುಪಾಲಕರು
ವಾಲ್ಯೂಕೆಡ ಗೋಲ್ಡ್‌ರೂಟ್ ಗ್ರಾಮದ
178-30 ಎಕರೆ/ಹೆಕ್ಟೇರ್ ಅರಣ್ಯ/ಕಂದಾಯ ಪ್ರದೇಶದಲ್ಲಿ
ಕೈಗಾರಿಕಾ ಅರಣ್ಯ ವಿಸ್ತೀರ್ಣ ವಿಸ್ತಾರಿಸಿರುವ ಅರ್ಜಿ ಬಗ್ಗೆ.
ಉಲ್ಲೇಖ: ಅರ್ಜಿಯ ಸಂಖ್ಯೆ: 233 AML-99 ದಿನಾಂಕ: 10.8.99

ಮೇಲ್ಕಂಡ ವಿಷಯಕ್ಕೆ ಸಂಬಂಧಿಸಿದಂತೆ ನಿಮ್ಮ ಅರ್ಜಿಯನ್ನು ಮುಂದುವರಿಸಲು ಈ ಕೆಳಕಂಡ ದಾಖಲೆ
ಗಳನ್ನು ಸಲ್ಲಿಸಲು ಸೂಚಿಸಿದೆ.

- 1) ಇಂಡಿಯನ್ ಬ್ಯೂರೋ ಆಫ್ ಮೈನ್ಸ್‌ರವರಿಂದ ಅಪುಮೋದಿಸಲ್ಪಟ್ಟಿರುವ ಮೈನಿಂಗ್ ಪ್ಲಾನ್
178-30 ಎಕರೆ(ತ್ರಿಪ್ರತಿಯಲ್ಲಿ) ಸಕ್ಷೆಲಗತ್ತಿಸಿದೆ.
- 2) ಕರ್ನಾಟಕ ರಾಜ್ಯ ಮಾಲಿನ್ಯ ನಿಯಂತ್ರಣ ಮಂಡಳಿಯವರಿಂದ ಪಡೆದ ವಿಮೋಚನಾ ಪತ್ರ.
- 3) ಭಾರತ ಸರ್ಕಾರದಿಂದ ಪಡೆದ ಎಂ.ಓ.ಇ.ಎಫ್. ಬಿಡುಗಡೆ ಪತ್ರ.
- 4) ಅರಣ್ಯ ಸಂರಕ್ಷಣಾ ಕಾಯಿದೆ 1980ರ ಸೆಕ್ಷನ್ 2ರ ಪ್ರಕಾರ ಅರಣ್ಯ ಇಲಾಖೆಯಿಂದ ಪಡೆದ ಬಿಡುಗಡೆ
ಅನುಮತಿ ಪತ್ರ.
- 5) ಪರಿಸರ ಸಂರಕ್ಷಣಾ ಕಾಯಿದೆ 1986ರ ಪ್ರಕಾರ ಪಡೆದ ಅನುಮತಿ ಪತ್ರ.

ತಮ್ಮ ವಿಶ್ವಾಸಿ,

ಆಯುಕ್ತರು ಮತ್ತು ನಿರ್ದೇಶಕರು

PHONE NO. :

MFR. 27 2008 10:34AM P1

Ministry of India
Ministry of Mines

No.5/184/2007-MMM/114
To

The Secretary to the Govt. of Karnataka
(Mines, SSI & Textiles),
Commerce & Industries Department,
M.S.Bldg. Bangalore(Karnataka).

New Delhi, the 17th March, 2008



Subject: Grant of Mining Lease for iron ore and manganese ore over an area of 178.30 acres in Gollarahalli, Hosahalli and Aravatti villages of C.N. Halli Taluk, Tumkur distt. in favour of M/s Mineral Enterprises Pvt Ltd. for a period of 30(thirty) years.

Sir,

1. I am directed to refer to your letter No. CI.37:MMM/2001 dated 04/05.10.2007 on the subject mentioned above and to convey the prior approval of Central Govt. under Section 5 (1) of the Mines and Mineral (Development and Regulation) Act, 1957 to the grant of mining lease for iron ore and manganese ore over an area of 178.30 acres in Gollarahalli, Hosahalli and Aravatti villages of C.N. Halli Taluk, Tumkur distt. in favour of M/s Mineral Enterprises Pvt Ltd. for a period of 30(thirty) years subject to outcome of writ petition(s)/appeal pending against the proposal.

2. Before allowing grant of mining lease the State Govt. may also kindly ensure the compliance of the attended provisions of the Act and Rules, and other applicable Acts and Rules including Forest (Conservation) Act, 1980 and Environmental Notification dated 27.01.1994 as issued and amended by MoEF.

3. A copy of the order passed by the State Govt. in the matter may kindly be furnished to this Ministry for record.

Yours faithfully,

(Anil Subramanyam)

Under Secretary to the Govt. of India

Regd./copy to:

1. The Controller General, Indian Bureau of Mines, Indira Bhawan, Civil Lines, Nagpur-440001.
2. The Chairman-sum-Managing director, Mineral Exploration Corpn. Ltd., High Land Drive Road, Seminary Hills, Nagpur-440006.
3. PS to Minister of Mines 4 Guard File.

(Anil Subramanyam)

Under Secretary to the Govt. of India

1/24/08

1/24/08

ANNEXURE - II

LIST OF DIRECTOR'S OF MINERAL ENTERPRISES LIMITED

Name	Designation	Residential Address & Phone No.	Office Address & Phone No.
K.P. Poddar	Director	# 487, 10 th Cross, RMV Extension, Bangalore - 560 080 Phone: 23610860	Mineral Enterprises Ltd., # 300/1B, 16 th Cross, Sadashivnagar, Bangalore - 80 Phone: 23613182 / 23612569 Fax : 23612737 E-mail: minent@blr.vsnl.net.in
Vikram Poddar	Director	# 487, 10 th Cross, RMV Extension, Bangalore - 560 080 Phone: 23610640	- do -
Basant Poddar	Managing Director	# 487, 10 th Cross, RMV Extension, Bangalore - 560 080 Phone: 23611475	- do -
H.R. Jain	Director & Chief Executive	No. 13, MTCS Extension, After 4 th Cross, RMS Colony, Sanjaynagar, Bangalore - 560 094. Phone : 23416557	- do -

ANNEXURE - III

CATEGORYWISE ORE RESERVES OF APPLIED MINING LEASE AREA (SARANGPANI IRON AND MANGANESE ORE DEPOSIT) OF M/s. MINERAL ENTERPRISES LTD

Section	Sectional influence	PROVED ORE			PROBABLE ORE			POSSIBLE ORE			TOTAL ORE
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ b.d with 70 % rec. Tons	Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ b.d with 70 % rec. Tons	Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ b.d with 70 % rec. Tons	
A-A'	110	12906	1419660	2782534	4376	481360	943466	2118	232980	456641	4182640
B-B'	100	10027	1002700	1965292	5470	547000	1072120	2749	274900	538804	3576216
C-C'	100	11519	1151900	2257724	5460	546000	1070160	2730	273000	535080	3862964
D-D'	100	12228	1222800	2396688	5399	539900	1058204	2769	276900	542724	3997616
E-E'	80	2467	197360	386826	1309	104720	205251	724	57920	113523	705600
		9789063			4349201			2186772			16325036
Proved + Probable + Possible = 16325036 Tonnes											

Manganese Float Ore Reserves						
Category	Area m ²	Depth m	Volume m ³	Bulk Density T / m ³	Recovery %	Quantity Tons
Proved	18650	3	55950	2.8	20	31332
Total						31332



**BENCHWISE MINEABLE ORE RESERVES AND WASTE CALCULATIONS OF APPLIED MINING LEASE AREA
(SARANGPANI IRON AND MANGANESE ORE DEPOSIT) OF M/s. MINERAL ENTERPRISES LTD**

Bench Level m	Sectional Influence m	Ore			Intercalated		Laterite			Intercalated		Waste			Total Ore		Total Waste	
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons	waste with 2.2 t/m ³ with 30% rec. Tons	Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 30% rec. Tons	waste with 2.2 t/m ³ with 70% rec. Tons	Sectional area m ²	Volume m ³	Quantity @ 2.2 B.D Tons	Total Ore Tons	Total Waste Tons				
+1018	110	0	0	0	0	56	6160	5174	9486	0	0	0	5174	9486				
+1012	110	98	10780	21129	7115	90	9900	8316	15246	0	0	0	29445	22361				
+1006	110	139	15290	29968	10091	0	0	0	0	0	0	0	29968	10091				
+1000	110	160	17600	34496	11616	0	0	0	0	0	0	0	34496	11616				
+994	110	286	31460	61662	20764	0	0	0	0	0	0	0	61662	20764				
+988	110	511	56210	110172	37099	0	0	0	0	0	0	0	110172	37099				
+982	110	663	72930	142943	48134	0	0	0	0	0	0	0	142943	48134				
+976	110	892	98120	192315	64759	0	0	0	0	0	0	0	192315	64759				
+970	110	1106	121660	238454	80296	0	0	0	0	178	19580	43076	238454	123372				
+964	110	1053	115830	227027	76448	0	0	0	0	181	19910	43802	227027	120250				
+958	110	1000	110000	215600	72600	0	0	0	0	162	17820	39204	215600	111804				
+952	110	947	104170	204173	68752	0	0	0	0	142	15620	34364	204173	103116				
+946	110	895	98450	192962	64977	0	0	0	0	123	13530	29766	192962	94743				
+940	110	842	92620	181535	61129	0	0	0	0	104	11440	25168	181535	86297				
+928	110	789	86790	170108	57281	0	0	0	0	85	9350	20570	170108	77851				
+922	110	683	75130	147255	49586	0	0	0	0	66	7260	15972	147255	69478				
+916	110	631	69410	136044	45811	0	0	0	0	47	5170	11374	136044	60960				
+910	110	578	63580	124617	41963	0	0	0	0	28	3080	6776	124617	52587				
+916	110	172	18920	37083	12487	0	0	0	0	8	880	1936	124617	43899				
		Total		2626439	884413		13490		24732		272008	2639930		1181154				



SECTION B - B

Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec.			Laterite			Intercalated waste with 2.2 t/m ³ with 70% rec.			Waste			Total Ore		Total Waste		
		Sectional area	Volume	Qty @ 2.8 t/m ³ with 70% rec.	Sectional area	Volume	Qty @ 2.8 t/m ³ with 30% rec.	Sectional area	Volume	Qty @ 2.8 t/m ³ with 30% rec.	Sectional area	Volume	Qty @ 2.2 t/m ³ with 70% rec.	Sectional area	Volume	Qty @ 2.2 t/m ³ with 70% rec.	Tons	Tons	Tons	Tons	
+1024	100	0	0	0	0	0	0	0	0	0	0	0	218	21800	47960	0	47960	0	47960	0	47960
+1018	100	18	1800	3528	1188	3900	3900	39000	32760	60060	60060	731	73100	160820	36288	222068	36288	222068	36288	222068	
+1012	100	582	58200	114072	38412	10500	10500	10500	8820	16170	16170	678	67800	149160	122892	203742	122892	203742	122892	203742	
+1006	100	797	79700	156212	52602	0	0	0	0	0	0	625	62500	137500	156212	190102	156212	190102	156212	190102	
+1000	100	914	91400	179144	60324	0	0	0	0	0	0	572	57200	125840	179144	186164	179144	186164	179144	186164	
+994	100	1043	104300	204428	68838	0	0	0	0	0	0	520	52000	114400	204428	183238	204428	183238	204428	183238	
+988	100	1180	118000	231280	77880	0	0	0	0	0	0	466	46600	102520	231280	180400	231280	180400	231280	180400	
+982	100	1297	129700	254212	85602	0	0	0	0	0	0	413	41300	90860	254212	176462	254212	176462	254212	176462	
+976	100	1402	140200	274792	92532	0	0	0	0	0	0	361	36100	79420	274792	171952	274792	171952	274792	171952	
+970	100	1488	148800	291648	98208	0	0	0	0	0	0	308	30800	67760	291648	165968	291648	165968	291648	165968	
+964	100	1564	156400	306544	103224	0	0	0	0	0	0	255	25500	56100	306544	159324	306544	159324	306544	159324	
+958	100	1630	163000	319480	107580	0	0	0	0	0	0	228	22800	50160	319480	157740	319480	157740	319480	157740	
+952	100	1649	164900	323204	108834	0	0	0	0	0	0	216	21600	47520	323204	156354	323204	156354	323204	156354	
+946	100	1649	164900	323204	108834	0	0	0	0	0	0	144	14400	31680	323204	140514	323204	140514	323204	140514	
+940	100	1649	164900	323204	108834	0	0	0	0	0	0	71	7100	15620	323204	124454	323204	124454	323204	124454	
+934	100	1369	136900	268324	90354	0	0	0	0	0	0	8	800	1760	268324	92114	268324	92114	268324	92114	
		Total		3573276	1203246				41580	76230					1279080		3614856		2558556		2558556

SECTION C - C

Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec.			Laterite			Intercalated waste with 2.2 t/m ³ with 70% rec.			Waste			Total Ore		Total Waste		
		Sectional area	Volume	Qty @ 2.8 t/m ³ with 70% rec.	Sectional area	Volume	Qty @ 2.8 t/m ³ with 30% rec.	Sectional area	Volume	Qty @ 2.8 t/m ³ with 30% rec.	Sectional area	Volume	Qty @ 2.2 t/m ³ with 70% rec.	Sectional area	Volume	Qty @ 2.2 t/m ³ with 70% rec.	Tons	Tons	Tons	Tons	
+1024	100	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
+1018	100	391	39100	76636	25806	335	33500	28140	51590	17864	74	7400	16280	9744	34144	34144	9744	34144	9744	34144	
+1012	100	954	95400	186984	62964	0	0	0	0	0	0	677	67700	148940	186984	211904	148940	186984	148940	211904	
+1006	100	1061	106100	207956	70026	0	0	0	0	0	0	625	62500	207956	207956	207526	207956	207526	207956	207526	
+1000	100	1201	120100	235396	79266	0	0	0	0	0	0	572	57200	137500	235396	201124	235396	201124	235396	201124	
+994	100	1314	131400	257544	86724	0	0	0	0	0	0	467	46700	102740	257544	201124	257544	201124	257544	201124	
+988	100	1400	140000	274400	92400	0	0	0	0	0	0	414	41400	91080	274400	195140	274400	195140	274400	195140	
+982	100	1491	149100	292236	98406	0	0	0	0	0	0	361	36100	292236	292236	189486	292236	189486	292236	189486	
+976	100	1581	158100	309876	104946	0	0	0	0	0	0	339	33900	309876	309876	183766	309876	183766	309876	183766	
+970	100	1637	163700	320852	108042	0	0	0	0	0	0	340	34000	320852	320852	182622	320852	182622	320852	182622	
+964	100	1637	163700	320852	108042	0	0	0	0	0	0	268	26800	320852	320852	182842	320852	182842	320852	182842	
+958	100	1637	163700	320852	108042	0	0	0	0	0	0	196	19600	320852	320852	167002	320852	167002	320852	167002	
+952	100	1637	163700	320852	108042	0	0	0	0	0	0	124	12400	320852	320852	151162	320852	151162	320852	151162	
+946	100	1637	163700	320852	108042	0	0	0	0	0	0	52	5200	320852	320852	135322	320852	135322	320852	135322	
+940	100	1637	163700	320852	108042	0	0	0	0	0	0	0	0	320852	119482	320852	119482	320852	119482	320852	
+934	100	483	48300	94668	31878	0	0	0	0	0	0	0	0	94668	31878	119482	94668	31878	119482	94668	
		Total		3860808	1300068				37884	69454					127180		3898692		2616702		2616702

SECTION D - D'

Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m3 with 30% rec. Tons	Sectional area m2	Volume m3	Qty @ 2.8 t/m3 with 70% rec. Tons	Laterite Volume m3	Qty @ 2.8 t/m3 with 30% rec. Tons	Intercalated waste with 2.2 t/m3 with 70% rec. Tons	Waste			Total Ore Tons	Total Waste Tons
		Sectional area m2	Volume m3	Qty @ 2.8 t/m3 with 70% rec. Tons								Sectional area m2	Volume m3	Quantity @ 2.2 B.D Tons		
+1018	100	33	3300	6468	2178	0	0	0	0	0	0	0	0	6468	2178	
+1012	100	480	48000	94080	31680	18	1800	1512	1800	2772	0	0	0	95592	34452	
+1006	100	864	86400	169344	57024	168	16800	14112	16800	25872	0	0	0	183456	82896	
+1000	100	1217	121700	238532	80322	43	4300	3612	4300	6622	0	0	0	242144	110264	
+994	100	1414	141400	277144	93324	0	0	0	0	0	0	0	0	277144	155804	
+988	100	1430	143000	280280	94380	0	0	0	0	0	0	0	0	280280	191400	
+982	100	1411	141100	276556	93126	0	0	0	0	0	0	0	0	276556	187946	
+976	100	1392	139200	272832	91872	0	0	0	0	0	0	0	0	272832	175032	
+970	100	1372	137200	268912	90552	0	0	0	0	0	0	0	0	268912	162272	
+964	100	1353	135300	265188	89298	0	0	0	0	0	0	0	0	265188	149138	
+958	100	1334	133400	261464	88044	0	0	0	0	0	0	0	0	261464	136444	
+952	100	1315	131500	257740	86790	0	0	0	0	0	0	0	0	257740	123530	
+946	100	1295	129500	253820	85470	0	0	0	0	0	0	0	0	253820	110770	
+940	100	1276	127600	250096	84216	0	0	0	0	0	0	0	0	250096	97856	
+934	100	1257	125700	246372	82962	0	0	0	0	0	0	0	0	246372	84942	
+928	100	364	36400	71344	24024	0	0	0	0	0	0	0	0	71344	24024	
Total				3490172	1175262			19236			35266			3509408	1828948	

SECTION E - E'

Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m3 with 30% rec. Tons	Sectional area m2	Volume m3	Qty @ 2.8 t/m3 with 70% rec. Tons	Laterite Volume m3	Qty @ 2.8 t/m3 with 30% rec. Tons	Intercalated waste with 2.2 t/m3 with 70% rec. Tons	Waste			Total Ore Tons	Total Waste Tons
		Sectional area m2	Volume m3	Qty @ 2.8 t/m3 with 70% rec. Tons								Sectional area m2	Volume m3	Quantity @ 2.2 B.D Tons		
+994	80	81	6480	12701	4277	0	0	0	0	0	0	0	0	12701	53557	
+988	80	158	12640	24774	8342	0	0	0	0	0	0	0	0	24774	62902	
+982	80	139	11120	21795	7339	0	0	0	0	0	0	0	0	21795	52571	
+976	80	119	9520	18659	6283	0	0	0	0	0	0	0	0	18659	42187	
+970	80	101	8080	15837	5333	0	0	0	0	0	0	0	0	15837	31909	
+964	80	81	6480	12701	4277	0	0	0	0	0	0	0	0	12701	21701	
+958	80	62	4960	9722	3274	0	0	0	0	0	0	0	0	9722	11370	
+952	80	36	2880	5645	1901	0	0	0	0	0	0	0	0	5645	1901	
Total				121834	41026			0			0			237072	278098	

TOTAL ORE 13784719 Tonnes TOTAL WASTE 8463457 Tonnes ORE TO WASTE RATIO 1 0.61



Manganese Float Mineable Ore Reserves			
Area m ²	Depth m	Qty @ 2.8 t/m3 with 20% rec. Tonnes	Waste Qty @ 2.2 B.D with 80% Rec in Tonnes
17635	3	52905	93113

BENCHWISE MINEABLE ORE RESERVES

Bench Level	A-A'	B-B'	C-C'	D-D'	E-E'	TOTAL in Tonnes
+1030	0	0	0	0	0	0
+1024	0	0	9744	0	0	9744
+1018	5174	36288	104776	6468	0	152706
+1012	29445	122892	186984	95592	0	434913
+1006	29968	156212	207956	183456	0	577592
+1000	34496	179144	235396	242144	0	691180
+994	61662	204428	257544	277144	12701	813478
+988	110172	231280	274400	280280	24774	920906
+982	142943	254212	292236	276556	21795	987742
+976	192315	274792	309876	272832	18659	1068474
+970	238454	291648	320852	268912	15837	1135702
+964	227027	306544	320852	265188	12701	1132312
+958	215600	319480	320852	261464	9722	1127118
+952	204173	323204	320852	257740	5645	1111614
+946	192962	323204	320852	253820	0	1090838
+940	181535	323204	320852	250096	0	1075687
+934	170108	268324	94668	246372	0	779472
+928	158897	0	0	71344	0	230241
+922	147255	0	0	0	0	147255
+916	136044	0	0	0	0	136044
+910	124617	0	0	0	0	124617
+916	37083	0	0	0	0	37083
Total	2639930	3614856	3898692	3509408	121834	13784719

BENCHWISE MINEABLE WASTE

Bench Level	A-A'	B-B'	C-C'	D-D'	E-E'	TOTAL in Tonnes
+1030	0	0	0	0	0	0
+1024	0	47960	34144	0	0	82104
+1018	9486	222068	218196	2178	0	451928
+1012	22361	203742	211904	34452	0	472459
+1006	10091	190102	207526	82896	0	490615
+1000	11616	186164	205106	110264	0	513150
+994	20764	183238	201124	155804	53557	614486
+988	37099	180400	195140	191400	62902	666941
+982	48134	176462	189486	187946	52571	654599
+976	64759	171952	183766	175032	42187	637696
+970	123372	165968	182622	162272	31909	666142
+964	120250	159324	182842	149138	21701	633255
+958	111804	157740	167002	136444	11370	584360
+952	103116	156354	151162	123530	1901	536063
+946	94743	140514	135322	110770	0	481349
+940	86297	124454	119482	97856	0	428089
+934	77851	92114	31878	84942	0	286785
+928	69478	0	0	24024	0	93502
+922	60960	0	0	0	0	60960
+916	52587	0	0	0	0	52587
+910	43899	0	0	0	0	43899
+916	12487	0	0	0	0	12487
Total	1181154	2558556	2616702	1828948	278098	8463457



Bench Level	ORE in Tonnes	WASTE in Tonnes	RATIO
+1024	9744	82104	1:8.40
+1018	152706	451928	1:2.95
+1012	434913	472459	1:1.08
+1006	577592	490615	1:0.84
+1000	691180	513150	1:0.74
+994	813478	614486	1:0.75
+988	920906	666941	1:0.72
+982	987742	654599	1:0.66
+976	1068474	637696	1:0.59
+970	1135702	666142	1:0.58
+964	1132312	633255	1:0.55
+958	1127118	584360	1:0.51
+952	1111614	536063	1:0.48
+946	1090838	481349	1:0.44
+940	1075687	428089	1:0.39
+934	779472	286785	1:0.36
+928	230241	93502	1:0.40
+922	147255	60960	1:0.41
+916	136044	52587	1:0.38
+910	124617	43899	1:0.35
+916	37083	12487	1:0.33
Total	13784719	8463457	1:0.61

PRODUCTION & DEVELOPMENT SCHEME OF APPLIED MINING LEASE AREA
(SARANGPANI IRON AND MANGANESE ORE DEPOSIT) OF M/s. MINERAL ENTERPRISES LTD

I - YEAR

SECTION B - B'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 l/m ³ with 30% rec.		Laterite		Intercalated waste with 2.2 l/m ³ with 70% rec.		Waste		
		Sectional area m ²	Volume m ³	Qty @ 2.8 l/m ³ with 70% rec. Tons	Sectional area m ²	Volume m ³	Qty @ 2.8 l/m ³ with 30% rec. Tons	Sectional area m ²	Volume m ³	Sectional area m ²	Volume m ³	Quantity @ 2.2 B.D Tons	Total Waste Tons
+1018	100		0	0	0	0	230	23000	19320	0	0	19320	35420
+1012	100	276	27600	54096	18216	9500	95	9500	7980	14630	0	62076	32846
Total				54096	18216			27300		50050	0	81396	68266

SECTION C - C'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 l/m ³ with 30% rec.		Laterite		Intercalated waste with 2.2 l/m ³ with 70% rec.		Waste		
		Sectional area m ²	Volume m ³	Qty @ 2.8 l/m ³ with 70% rec. Tons	Sectional area m ²	Volume m ³	Qty @ 2.8 l/m ³ with 30% rec. Tons	Sectional area m ²	Volume m ³	Sectional area m ²	Volume m ³	Quantity @ 2.2 B.D Tons	Total Waste Tons
+1024	100		0	0	0	9000	90	9000	7560	13860	0	7560	13860
+1018	100	255	25500	49980	16830	29600	296	29600	24864	45584	0	74844	62414
+1012	100	656	65600	128576	43296	0	0	0	0	0	0	128576	43296
Total			178556	60126		32424		59444		210980	0	119570	

SECTION D - D'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 l/m ³ with 30% rec.		Laterite		Intercalated waste with 2.2 l/m ³ with 70% rec.		Waste		
		Sectional area m ²	Volume m ³	Qty @ 2.8 l/m ³ with 70% rec. Tons	Sectional area m ²	Volume m ³	Qty @ 2.8 l/m ³ with 30% rec. Tons	Sectional area m ²	Volume m ³	Sectional area m ²	Volume m ³	Quantity @ 2.2 B.D Tons	Total Waste Tons
+1018	100	34	3400	6664	2244	0	0	0	0	0	0	6664	2244
+1012	100	482	48200	94472	31812	1800	18	1800	1512	2772	0	95984	34584
Total			101136	34056		1512		2772		102648	0	36828	

TOTAL ORE 395024 Tonnes TOTAL WASTE 224664 Tonnes ORE TO WASTE RATIO 1 0.57

Manganese Float Mineable Ore Reserves			
Area m ²	Depth m	Volume m ³	Waste Qty @ 2.2 B.D with 20% rec. Tonnes with 80% Rec in Tonnes
2977	3	8931	5001
			15719

Total Ore 400025 Tonnes
Total Waste 240383 Tonnes
Ore to Waste Ratio 1:0.60



**PRODUCTION & DEVELOPMENT SCHEME OF APPLIED MINING LEASE AREA
(SARANGPANI IRON AND MANGANESE ORE DEPOSIT) OF M/s. MINERAL ENTERPRISES LTD**

II - YEAR

SECTION A - A'												
Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec.	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec.	Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 t/m ³ with 70% rec.		Sectional area	Volume		Sectional area	Volume		
m		m ²	m ³	Tons	Tons	m ²	m ³	Tons	m ²	m ³	Tons	Tons
+1018	110	0	0	0	0	56	6160	5174	0	0	0	9486
+1012	110	98	10780	21129	7115	17	1870	1571	0	0	0	22700
+1006	110	67	7370	14445	4864	0	0	0	0	0	0	14445
	Total			35574	11979			6745			0	42319

SECTION B - B'												
Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec.	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec.	Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 t/m ³ with 70% rec.		Sectional area	Volume		Sectional area	Volume		
m		m ²	m ³	Tons	Tons	m ²	m ³	Tons	m ²	m ³	Tons	Tons
+1018	100	18	1800	3528	1188	160	16000	13440	427	42700	93940	119768
+1012	100	309	30900	60564	20394	0	0	0	221	22100	48620	60564
+1006	100	798	79800	156408	52668	0	0	0	96	9600	21120	156408
	Total			220500	74250			13440			163680	233940

SECTION C - C'												
Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec.	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec.	Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 t/m ³ with 70% rec.		Sectional area	Volume		Sectional area	Volume		
m		m ²	m ³	Tons	Tons	m ²	m ³	Tons	m ²	m ³	Tons	Tons
+1024	100	0	0	0	0	25	2500	2100	0	0	0	3850
+1018	100	137	13700	26852	9042	38	3800	3192	388	38800	85360	100254
+1012	100	300	30000	58800	19800	0	0	0	240	24000	52800	72600
+1006	100	1061	106100	207956	70026	0	0	0	115	11500	25300	207956
	Total			293608	98868			5292			163460	272030

SECTION D - D'												
Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec.	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec.	Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 t/m ³ with 70% rec.		Sectional area	Volume		Sectional area	Volume		
m		m ²	m ³	Tons	Tons	m ²	m ³	Tons	m ²	m ³	Tons	Tons
+1006	100	865	86500	169540	57090	165	16500	13860	0	0	0	82500
+1000	100	186	18600	36456	12276	0	0	0	0	0	0	12276
	Total			205996	69366			13860			0	94776

TOTAL ORE	795015 Tonnes	TOTAL WASTE	653721 Tonnes	ORE TO WASTE RATIO	1.082
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Manganese Float Mineable Ore Reserves				
Area	Depth	Volume	Qty @ 2.8 t/m ³ with 20% rec.	Waste
m ²	m	m ³	Tonnes	with 80% Rec in Tonnes
2977	3	8931	5001	15719

Total Ore 800017
 Total Waste 669440
 Ore to Waste Ratio 1:0.82



**PRODUCTION & DEVELOPMENT SCHEME OF APPLIED MINING LEASE AREA
(SARANGPANI IRON AND MANGANESE ORE DEPOSIT) OF M/s. MINERAL ENTERPRISES LTD**

III - YEAR

SECTION B - B'																	
Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 l/m ³ with 30% rec.			Laterite			Intercalated waste with 2.2 l/m ³ with 70% rec.			Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 l/m ³ with 70% rec.	Sectional area	Volume	Qty @ 2.8 l/m ³ with 30% rec.	Sectional area	Volume	Sectional area	Volume	Sectional area	Volume	Sectional area	Volume		
m	m	m ²	m ³	Tons	m ²	m ³	Tons	m ²	m ³	Tons	m ²	m ³	m ²	m ³	Tons	Tons	
+1018	100		0	0		0	0		0	0	308	30800		67760	0	67760	
+1012	100		0	0		0	0		0	0	216	21600		47520	0	47520	
+1006	100		0	0		0	0		0	0	216	21600		47520	0	47520	
+1000	100	914	91400	179144		60324	60324		0	0	187	18700		41140	179144	101464	
Total				179144		60324	60324							203940	179144	264264	

SECTION C - C'																	
Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 l/m ³ with 30% rec.			Laterite			Intercalated waste with 2.2 l/m ³ with 70% rec.			Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 l/m ³ with 70% rec.	Sectional area	Volume	Qty @ 2.8 l/m ³ with 30% rec.	Sectional area	Volume	Sectional area	Volume	Sectional area	Volume	Sectional area	Volume		
m	m	m ²	m ³	Tons	m ²	m ³	Tons	m ²	m ³	Tons	m ²	m ³	m ²	m ³	Tons	Tons	
+1018	100		0	0		0	0		0	0	182	18200		40040	0	40040	
+1012	100		0	0		0	0		0	0	216	21600		47520	0	47520	
+1006	100		0	0		0	0		0	0	216	21600		47520	0	47520	
+1000	100	1010	101000	197960		66660	66660		0	0	206	20600		45320	197960	111980	
+994	100	849	84900	166404		56034	56034		0	0	81	8100		17820	166404	73854	
Total				364364		122694	122694							198220	364364	320914	

SECTION D - D'																	
Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 l/m ³ with 30% rec.			Laterite			Intercalated waste with 2.2 l/m ³ with 70% rec.			Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 l/m ³ with 70% rec.	Sectional area	Volume	Qty @ 2.8 l/m ³ with 30% rec.	Sectional area	Volume	Sectional area	Volume	Sectional area	Volume	Sectional area	Volume		
m	m	m ²	m ³	Tons	m ²	m ³	Tons	m ²	m ³	Tons	m ²	m ³	m ²	m ³	Tons	Tons	
+1000	100	1217	121700	238532		80322	80322		4300	4300	3612	3612		6622	242144	92444	
+994	100	813	81300	159348		53658	53658		0	0	117	11700		25740	159348	79398	
Total				397880		133980	133980				3612	3612		6622	401492	171842	

TOTAL ORE 945000 Tonnes TOTAL WASTE 757020 Tonnes ORE TO WASTE RATIO 1 0.80



Manganese Float Mineable Ore Reserves				
Area	Depth	Volume	Qty @ 2.8 l/m ³ with 20% rec.	Waste Qty @ 2.2 B.D with 80% Rec. in Tonnes
m ²	m	m ³	Tonnes	Tonnes
2977	3	8931	5001	15719

Total Ore 950001 Tonnes
Total Waste 772739 Tonnes
Ore to Waste Ratio 1:0.81

**PRODUCTION & DEVELOPMENT SCHEME OF APPLIED MINING LEASE AREA
(SARANGPANI IRON AND MANGANESE ORE DEPOSIT) OF M/s. MINERAL ENTERPRISES LTD**

IV - YEAR

SECTION B - B'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Waste Tons		
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²		Volume m ³	Quantity @ 2.2 B.D Tons
+1018	100		0	0	0	0	0	0	137	13700	30140	0	30140
+1012	100		0	0	0	0	0	0	108	10800	23760	0	23760
+1006	100		0	0	0	0	0	0	108	10800	23760	0	23760
+1000	100		0	0	0	0	0	0	108	10800	23760	0	23760
+994	100	1043	104300	204428	68838	0	0	0	170	17000	37400	204428	106238
	Total			204428	68838		0	0			138820	204428	207658

SECTION C - C'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Waste Tons		
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²		Volume m ³	Quantity @ 2.2 B.D Tons
+1018	100		0	0	0	0	0	0	70	7000	15400	0	15400
+1012	100		0	0	0	0	0	0	108	10800	23760	0	23760
+1006	100		0	0	0	0	0	0	108	10800	23760	0	23760
+1000	100		0	0	0	0	0	0	108	10800	23760	0	23760
+994	100	466	46600	91336	30756	0	0	0	108	10800	23760	91336	54516
+988	100	1400	140000	274400	92400	0	0	0	65	6500	14300	274400	106700
	Total			365736	123156		0	0			124740	365736	247896

SECTION D - D'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Waste Tons		
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²		Volume m ³	Quantity @ 2.2 B.D Tons
+994	100	604	60400	118384	39864	0	0	0	62	6200	13640	118384	53504
+988	100	1430	143000	280280	94380	0	0	0	103	10300	22860	280280	117040
	Total			398664	134244		0	0			36300	398664	170544

SECTION E - E'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Waste Tons		
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²		Volume m ³	Quantity @ 2.2 B.D Tons
+994	80	81	6480	12701	4277	0	0	0	95	7600	16720	12701	20497
+988	80	86	6880	13485	4541	0	0	0	180	14400	31680	13485	24221
	Total			26186	8818		0	0			48499	26186	44718

TOTAL ORE 995014 Tonnes **TOTAL WASTE** 683316 Tonnes **ORE TO WASTE RATIO** 1:0.69

Manganese Float Mineable Ore Reserves				
Area m ²	Depth m	Volume m ³	Qty @ 2.8 t/m ³ with 20% rec. Tonnes	Waste Qty @ 2.2 B.D with 80% Rec. in Tonnes
2977	3	8931	5001	15719

Total Ore 1000015 Tonnes
Total Waste 699034 Tonnes
Ore to Waste Ratio 1:0.70



**PRODUCTION & DEVELOPMENT SCHEME OF APPLIED MINING LEASE AREA
(SARANGPANI IRON AND MANGANESE ORE DEPOSIT) OF M/s. MINERAL ENTERPRISES LTD**

V - YEAR

SECTION A - A'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Ore Tons	Total Waste Tons	
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²			Volume m ³
+1006	110	72	7920	15523	5227	0	0	0	0	0	15523	5227	
+1000	110	160	17600	34496	11616	0	0	0	0	0	34496	11616	
+994	110	286	31460	61662	20764	0	0	0	0	0	61662	20764	
+988	110	511	56210	110172	37099	0	0	0	0	0	110172	37099	
+982	110	663	72930	142943	48134	0	0	0	0	0	142943	48134	
	Total		364795	122839	122839	0	0	0	0	0	364795	122839	

SECTION B - B'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Ore Tons	Total Waste Tons	
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²			Volume m ³
+1018	100	0	0	0	0	0	0	0	72	7200	15840	15840	
+1012	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+1006	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+1000	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+994	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+988	100	1180	118000	231280	77880	0	0	0	154	15400	33880	231280	
+982	100	1296	129800	254408	85668	0	0	0	29	2900	6380	254408	
	Total		485688	163548	163548	0	0	0			151140	314688	

SECTION C - C'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Ore Tons	Total Waste Tons	
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²			Volume m ³
+1018	100	0	0	0	0	0	0	0	23	2300	5060	5060	
+1012	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+1006	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+1000	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+994	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+988	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+982	100	1492	149200	292432	98472	0	0	0	48	4800	10560	292432	
	Total		292432	292432	98472	0	0	0			292432	109032	

SECTION D - D'													
Bench Level m	Sectional Influence m	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec. Tons	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec. Tons	Waste		Total Ore Tons	Total Waste Tons	
		Sectional area m ²	Volume m ³	Qty @ 2.8 t/m ³ with 70% rec. Tons		Sectional area m ²	Volume m ³		Qty @ 2.8 t/m ³ with 30% rec. Tons	Sectional area m ²			Volume m ³
+994	100	0	0	0	0	0	0	0	8	800	1760	1760	
+988	100	0	0	0	0	0	0	0	108	10800	23760	23760	
+982	100	1410	141000	276360	93060	0	0	0	86	8600	18920	276360	
	Total		276360	276360	93060	0	0	0			44440	276360	



SECTION E - E'

Bench Level	Sectional Influence	Ore			Intercalated waste with 2.2 t/m ³ with 30% rec.	Laterite		Intercalated waste with 2.2 t/m ³ with 70% rec.	Waste		Total Ore	Total Waste
		Sectional area	Volume	Qty @ 2.8 t/m ³ with 70% rec.		Sectional area	Volume		Sectional area	Volume		
m	m	m ²	m ³	Tons	Tons	m ²	m ³	Tons	m ²	m ³	Tons	Tons
+988	80	71	5680	11133	3749	0	0	0	108	8640	19008	22757
+982	80	64	5120	10035	3379	0	0	0	164	13120	28864	32243
	Total			21168	7128		0	0			47872	55000
TOTAL ORE		1440443 Tonnes		TOTAL WASTE		862919 Tonnes		ORE TO WASTE RATIO		1 0.60		

Manganese Float Mineable Ore Reserves			
Area	Depth	Volume	Waste
m ²	m	m ³	Qty @ 2.2 B.D
5727	3	17181	30239
		9621	

Total Ore 1450065 Tonnes
 Total Waste 893158 Tonnes
 Ore to Waste Ratio 1:0.60





*Environment
Monitoring Data*

AMBIENT AIR QUALITY DATA

Client : M/s Mineral Enterprises Ltd
Season : Winter Season 2007

Monitoring Station : Hosahalli
Station Code : BA2



S.No	Date	24 Hourly Average Concentration, $\mu\text{g}/\text{Nm}^3$			
		SPM	RPM	SO ₂	NO _x
1	04/01/07	154	40.2	7.8	9.0
2	05/01/07	168	42.2	9.5	10.0
3	09/01/07	178	45.2	8.0	8.3
4	10/01/07	160	43.1	9.2	10.0
5	16/01/07	170	36.2	7.3	9.0
6	17/01/07	155	44.2	9.8	10.0
7	22/01/07	147	54.3	8.1	9.0
8	23/01/07	172	48.2	10.3	11.5
9	06/02/07	170	52.2	9.4	11.0
10	07/02/07	148	29.7	7.6	9.0
11	12/02/07	152	39.2	9.4	8.0
12	13/02/07	143	37.2	6.8	9.0
13	21/02/07	137	41.3	7.1	8.8
14	22/02/07	141	46.0	9.1	6.9
15	26/02/07	125	41.2	7.8	8.8
16	27/02/07	157	40.0	6.6	7.9
17	09/03/07	152	46.1	9.8	10.0
18	10/03/07	148	43.2	9.1	11.0
19	14/03/07	152	30.9	7.6	9.0
20	15/03/07	140	32.7	7.1	8.0
21	22/03/07	136	35.6	6.7	9.5
22	23/03/07	156	41.2	6.1	8.0
23	27/03/07	161	53.3	8.2	9.0
24	28/03/07	158	47.2	7.4	8.0
Statistical Data					
Minimum		125.00	29.70	6.10	6.90
Average		153.33	42.11	8.16	9.11
Maximum		178.00	54.30	10.3	11.5
98th Percentile		175.24	53.84	10.07	11.27

AMBIENT AIR QUALITY DATA

Client : M/s Mineral Enterprises Ltd
Season : Winter Season 2007

Monitoring Station : Bullenahalli
Station Code : BA3



S.No	Date	24 Hourly Average Concentration, $\mu\text{g}/\text{Nm}^3$			
		SPM	RPM	SO ₂	NO _x
1	04/01/07	167	53.3	9.0	12.5*
2	05/01/07	155	50.2	8.0	14.0
3	09/01/07	143	51.2	11.0	15.0
4	10/01/07	158	48.7	9.0	10.0
5	16/01/07	136	44.2	8.5	10.2
6	17/01/07	151	46.2	10.1	12.0
7	22/01/07	145	55.0	8.7	13.0
8	23/01/07	160	48.1	10.5	15.0
9	06/02/07	175	44.2	9.2	9.0
10	07/02/07	128	42.2	8.8	13.0
11	12/02/07	172	30.9	8.2	12.0
12	13/02/07	148	32.7	7.6	14.0
13	21/02/07	181	40.6	9.5	13.0
14	22/02/07	146	46.2	8.8	12.5
15	26/02/07	176	40.9	8.9	13.8
16	27/02/07	129	45.2	11.0	12.5
17	09/03/07	166	48.2	13.0	16.4
18	10/03/07	174	56.8	10.4	18.4
19	14/03/07	185	50.3	11.0	14.2
20	15/03/07	144	43.2	9.0	17.5
21	22/03/07	127	51.4	10.0	18.0
22	23/03/07	175	45.3	8.9	12.0
23	27/03/07	185	48.3	10.0	16.0
24	28/03/07	156	43.6	11.3	11.0
Statistical Data					
Minimum		127.0	30.9	7.6	9.0
Average		157.58	46.12	9.60	13.54
Maximum		185.0	56.8	13.0	18.4
98th Percentile		185.0	55.97	12.218	18.216

AMBIENT AIR QUALITY DATA

Client : M/s Mineral Enterprises Ltd
Season : Winter Season 2007

Monitoring Station : Yerekatte
Station Code : BA4



S.No	Date	24 Hourly Average Concentration, $\mu\text{g}/\text{Nm}^3$			
		SPM	RPM	SO ₂	NO _x
1	04/01/07	145	45.5	8.7	11.2
2	05/01/07	158	43.7	9.6	10.2
3	09/01/07	133	50.4	10.3	12.5
4	10/01/07	168	44.1	12.5	12.1
5	16/01/07	185	36.8	10.6	13.5
6	17/01/07	156	47.2	8.1	8.9
7	22/01/07	176	54.4	8.7	10.1
8	23/01/07	182	38.3	10.8	12.4
9	06/02/07	191	47.3	11.5	13.3
10	07/02/07	177	41.7	9.3	10.8
11	12/02/07	182	53.2	10.7	12.5
12	13/02/07	175	43.8	10.2	12.7
13	21/02/07	180	41.8	8.8	11.1
14	22/02/07	169	42.2	9.6	11.3
15	26/02/07	148	50.2	10.1	12
16	27/02/07	159	48.5	9.1	10.2
17	09/03/07	174	45.2	9.5	12.5
18	10/03/07	169	46.5	12.1	13.5
19	14/03/07	182	45.4	9.0	10.1
20	15/03/07	137	48.2	9.4	10.7
21	22/03/07	164	51.7	8.6	12.4
22	23/03/07	172	45.9	12.1	12.6
23	27/03/07	163	41.8	9.8	10.7
24	28/03/07	177	44.4	9.3	10.1
Statistical Data					
Minimum		133.00	36.80	8.1	10.1
Average		167.58	45.76	9.93	11.67
Maximum		191.00	54.40	12.5	13.5
98th Percentile		188.24	53.85	12.3	13.5

AMBIENT AIR QUALITY DATA

Client : M/s Mineral Enterprises Ltd
Season : Winter Season 2007

Monitoring Station : Mine Lease Area
Station Code : CAI



S.No	Date	24 Hourly Average Concentration, $\mu\text{g}/\text{Nm}^3$			
		SPM	RPM	SO ₂	NO _x
1	04/01/07	158	42.3	9.2	11.6 *
2	05/01/07	142	53.8	8.6	10.5
3	09/01/07	151	41.8	9.3	10.3
4	10/01/07	137	32.4	6.9	11.5
5	16/01/07	141	45.7	8.2	9.2
6	17/01/07	123	36.6	7.6	8.2
7	22/01/07	154	54.6	10.7	12.5
8	23/01/07	98	38.3	9.4	11.6
9	06/02/07	109	52.1	9.3	10.5
10	07/02/07	146	55.5	7.6	9.1
11	12/02/07	162	42.2	7.2	10.4
12	13/02/07	147	58.7	11.2	11.6
13	21/02/07	155	47.3	9.8	12.2
14	22/02/07	168	44.8	8.6	10.3
15	26/02/07	143	25.6	7.9	9.2
16	27/02/07	152	51.7	10.6	11.6
17	09/03/07	104	32.6	8.9	10.3
18	10/03/07	86	54.7	10.1	12.4
19	14/03/07	107	38.5	7.5	12.5
20	15/03/07	131	40.8	8.6	11.6
21	22/03/07	157	59.1	10.5	12.5
22	23/03/07	122	53.4	9.6	12.1
23	27/03/07	109	54.8	10.4	10.6
24	28/03/07	169	45.7	11.3	9.8
Statistical Data					
Minimum		86.00	25.60	6.9	8.2
Average		136.29	45.95	9.13	10.92
Maximum		169.00	59.10	11.3	12.5
98th Percentile		168.54	58.916	11.3	12.5

AMBIENT NOISE LEVELS

Client : M/s Mineral Enterprises Limited

Season : November 2007



Time (Hrs)	Lease Area (N1)	Hosalli (N2)
6:30	38.5	36.8
7:30	40.6	38.9
8:30	41.6	40.6
9:30	44.2	42.5
10:30	42.8	43.6
11:30	43.5	43.8
12:30	44.1	44.8
13:30	44.7	50.7
14:30	43.5	45.8
15:30	42.0	41.8
16:30	39.4	43.5
17:30	38.1	41.5
18:30	40.2	36.8
19:30	41.5	39.4
20:30	38.1	37.8
21:30	36.4	35.4
22:30	34.8	36.2
23:30	35.2	31.5
0:30	33.8	33.6
1:30	33.4	34.8
2:30	32.4	31.5
3:30	30.8	32.5
4:30	32.4	33.6
5:30	31.8	34.7
L_{Max}	44.7	50.7
L_{Min}	30.8	31.5
L₁₀	32.4	32.83
L₅₀	38.95	38.35
L₉₀	43.92	44.5
L_n	33.78	34.04
L_d	42.05	43.62
L_{dn}	42.39	43.54

Ground Water Quality Data

Project : M/s Mineral Enterprises Ltd
Month : November 2007



SL. No	Parameters	Unit	Hosahalli	Yerekatte	Standards IS-10800
			Bore well GW1	Bore well GW2	
1	Taste	-	Agreeable	Agreeable	Agreeable
2	Color	-	Colorless	Colorless	10
3	Turbidity in NTU	NTU	5.8	6.2	10
4	pH	-	7.9	7.5	6.5 to 8.5
5	Dissolved Solids	mg/l	458	372	500
6	Chlorides	mg/l	153	126	250
7	Sulphates as SO ₄	mg/l	BDL	BDL	150
8	Fluoride as F	mg/l	0.8	0.6	0.6 to 1.2
9	Copper as Cu	mg/l	BDL	BDL	0.05
10	Nitrates as NO ₃ -N	mg/l	21	17	45
11	Total Hardness as CaCO ₃	mg/l	142	123	300
12	Calcium as Ca	mg/l	47	32	75
13	Magnesium as Mg.	mg/l	13	17	30
14	Cyanide as CN	mg/l	BDL	BDL	0.05
15	Iron as Fe	mg/l	0.12	0.09	0.3
16	Lead as Pb	mg/l	0.01	0.02	0.05
17	Cadmium as Cd	mg/l	BDL	BDL	0.01
18	Hexavalent Chromium as Cr ⁺⁶	mg/l	BDL	BDL	0.05
19	Zinc as Zn	mg/l	0.5	0.3	5
20	Selenium as Se	mg/l	BDL	BDL	0.01
21	Manganese as Mn.	mg/l	0.05	0.07	0.1
22	Arsenic as As	mg/l	BDL	BDL	0.05
23	Mercury as Hg.	mg/l	BDL	BDL	0.001
24	Phenolic Compounds	mg/l	BDL	BDL	0.001
25	Most probable number of Coliform organisms per 100ml	no. per 100ml	Nil	Nil	10
26	Differential coliform test	-	-Ve	-Ve	Negative

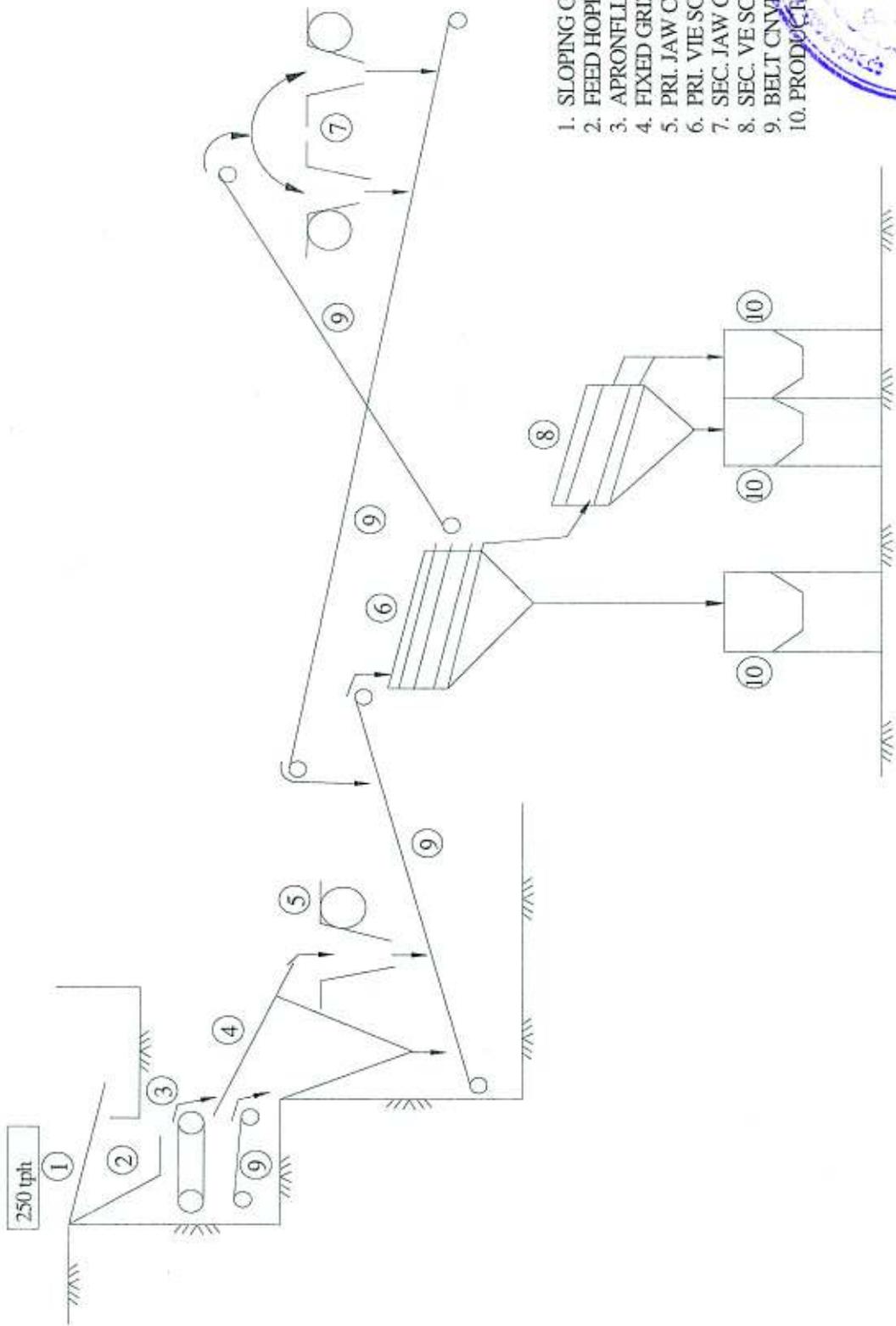
AMBIENT AIR QUALITY DATA

Client : M/s Mineral Enterprises Ltd
Season : Winter Season 2007

Monitoring Station : Katurikihalli
Station Code : BA5.



S.No	Date	24 Hourly Average Concentration, $\mu\text{g}/\text{Nm}^3$			
		SPM	RPM	SO ₂	NO _x
1	04/01/07	172	89	11.2	9.6
2	05/01/07	197	78	9.6	10.2
3	09/01/07	154	56	10.3	12.5
4	10/01/07	224	102	12.5	12.1
5	16/01/07	211	85	10.6	13.5
6	17/01/07	186	65	9.8	8.7
7	22/01/07	202	54	8.7	10.1
8	23/01/07	148	77	10.8	12.4
9	06/02/07	234	81	11.5	13.3
10	07/02/07	177	97	9.3	10.8
11	12/02/07	164	68	10.7	12.5
12	13/02/07	231	59	12.7	10.2
13	21/02/07	152	75	11.2	8.8
14	22/02/07	169	87	9.6	11.3
15	26/02/07	241	66	12.2	12.0
16	27/02/07	214	91	9.1	10.2
17	09/03/07	183	78	12.5	9.5
18	10/03/07	157	62	12.1	13.5
19	14/03/07	238	74	9.0	10.1
20	15/03/07	219	69	10.3	9.7
21	22/03/07	245	95	12.4	8.6
22	23/03/07	228	87	12.1	12.6
23	27/03/07	214	63	10.8	10.7
24	28/03/07	167	84	9.3	9.8
Statistical Data					
Minimum		148.0	54.0	8.70	8.60
Average		197.0	76.8	10.76	10.95
Maximum		245	102	12.70	13.50
98th Percentile		243.2	99.7	12.61	13.50



1. SLOPING GRIZZLY
2. FEED HOPPER
3. APRON FLOER 1400x3200 C/C
4. FIXED GRIZZLY
5. PRI. JAW CRUSHER 30"X15"
6. PRI. VIB SCREEN
7. SEC. JAW CRUSHER 36"X8"
8. SEC. VIB SCREEN 6'X16"
9. BELT CONVEYORS - 4NO
10. PRODUCT BUNKERS



PROPOSED CRUSHING AND SCREENING PLANT