

MINING PLAN

INCLUDING PROGRESSIVE MINE CLOSURE PLAN

Submitted under Rule 16 of MCR 2016 & Rule 23 of MCDR 2017 for approval



for

Kirloskar Channkeshava Mines

[M/s M. Channakeshava Reddy (ML No.2566) mine lease block]
in Lakkihalli & Kenkere villages, Hosadurga Taluka, Chitradurga District

of



Enriching Lives

KIRLOSKAR FERROUS INDUSTRIES LIMITED

Preferred Bidder- Rule 45 reg. no: IBM/161/2011



Area: 7.57 Ha
in Lakkihalli State Forest

Lease period: 50 years as per MMDR Amendment Act 2015

Category: A-Fully Mechanized, Open Cast, Private, Captive

Prepared by

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M.Sc. Mineral Exploration
Qualified Person

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M.Sc. Mineral Exploration
Qualified Person

Aug-2019



C O N T E N T S

| DETAILS | | PAGE NO. |
|--------------------|--|----------|
| Introductory Notes | | 1 |
| 1.0 | General | 4 |
| 2.0 | Location and accessibility | 5 |
| 3.0 | Details of approved Mining Plan | 7 |
| Part A | | |
| 1.0 | Geology and Exploration | 8 |
| 2.0 | Mining | 18 |
| 3.0 | Mine Drainage | 31 |
| 4.0 | Stacking of Mineral Reject /Sub Grade Material and Disposal of Waste | 32 |
| 5.0 | Use of Mineral | 35 |
| 6.0 | Processing of ROM and Mineral Reject | 36 |
| 7.0 | Others | 39 |
| 8.0 | Progressive Mine Closure Plan – Under Rule 23 of MCDR'1988 | 40 |
| Part B | | |
| 9.0 | Certificates /Undertakings | 53 |

ANNEXURES



| Nos. | DESCRIPTION |
|------|---|
| 1. | Copy of LOI by DMG, GoK for Mining Lease |
| 1a | Letter regarding R&R approval & Production Quantity |
| 2. | Certificate of Company Registration |
| 3. | List of Directors |
| 4. | Copy of Board Resolution |
| 5. | Photo ID of Nominated Owner |
| 6. | Copy of QP certificates |
| 7. | Borehole logs |
| 8. | Feasibility Study Report |
| 9. | Copy of Environmental Clearance |
| 10. | Copy of Forest Clearance |
| 11. | Extract of MECL report |
| 12. | Mahazar copy |



PLATES

| Nos. | DESCRIPTION | SCALE |
|------------|--|-----------|
| I a | Location Plan | NTS |
| I b | Key Plan / Precise area map on Toposheet | 1: 50,000 |
| I c | CEC Lease sketch | 1 : 3000 |
| II a | Surface Plan | 1 : 1000 |
| II b | Geological Plan | 1 : 1000 |
| II c | Geological Cross Sections | 1 : 1000 |
| II d | Graphical Lithologs | 1 : 500 |
| III a to e | Production development plans | 1 : 1000 |
| III f | Production development sections | 1 : 1000 |
| IV | Reclamation plan | 1 : 1000 |
| V | Environment Plan | 1 : 5000 |
| VI a | Conceptual Plan | 1 : 1000 |
| VI b | Dump Management Plan | 1 : 1000 |
| VII | Financial Area Assurance Plan | 1 : 1000 |

**INTRODUCTORY NOTE:**

M/s Kirloskar Ferrous Industries Limited (KFIL) is producing pig iron which is raw material for foundries and castings of International quality. Its Koppal Plant has an installed Pig Iron manufacturing capacity of 391,400 TPA and Casting capacity of 108,000 TPA near Bevinahalli village of Koppal taluk and Dist, Karnataka.

M/s M. Channakeshava Reddy (ML No.2566) mine lease block in Lakkihalli & Kenkere villages, Hosadurga Taluka, Chitradurga District over an extent of 7.57 ha area in Forest Land of Lakkihalli State Forest is a C category iron ore mining lease auctioned by GoK, and KFIL, is the 'Preferred Bidder' as per the Letter of Intent of Govt of Karnataka after e-auction.

Pursuant to the Hon'ble Supreme Court order dated 29th July 2011 and 26th August 2011, the mining operations and transportation of the iron ore from mining leases in the districts of Bellary, Tumkur and Chitradurga had been suspended. Central Empowered Committee was constituted by SC, in order to unravel the violations carried out by mining companies in Karnataka. As per the CEC's joint team survey, ML No. 2566, previously held by M/s M. Channakeshava Reddy has a total encroachment area of 3.91 Ha [under mining pit-0.24ha, OB dumps-3.53 ha and others category-0.14]. Based on their findings, the lease has been categorized under "C" category.

Further, the Hon'ble Supreme Court by its orders dated 5th August 2011 and 26th August 2011 had directed the Government of Karnataka to submit the Reclamation and Rehabilitation Plan(s) for the districts of Bellary, Tumkur and Chitradurga within three months. Subsequently, the Government of Karnataka vide letter dated 29th September 2011 has assigned the work of preparation of R & R Plan to the Indian Council for Forest Research and Education (ICFRE).

This Mining Plan is approved subject to the conditions / stipulations Indicated in the Mining Plan approval letter No. 279/784/2004/BNG


क्षेत्रीय खान नियंत्रक
 Regional Controller of Mines
 भारतीय खान ब्यूरो

QPs: Sripad Pujar, BVR Achar 27-08-2019

Indian Bureau of Mines
 बंगलूर / Bangalore - 5



However, CEC has opined that before finalizing the R & R plans of any of the Category 'C' mining leases, it may be appropriate that the mineral reserves to be estimated based on the exploration data undertaken by the State Govt. Accordingly the Govt. of Karnataka has outsourced the exploration work to M/s. Mineral Exploration Corporation Limited (MECL), a Government of India Enterprise, Nagpur, to assess the mineral reserves in all "C" category mines in Bellary, Chitradurga and Tumkur Districts of Karnataka State. Hence, this mining lease was also explored by drilling, and Exploration Report was submitted by MECL.

Supreme Court had directed Karnataka government to commence the auction of 14 'C' category iron ore mines in which end-user firms would be able to take part. M/s KFIL, having a Pig Iron Plant & Foundry has taken part in the auction process to ensure raw material self-sufficiency for its plant and emerged as 'Preferred Bidder'. The Dept of Mines & Geology (DMG) has issued a letter of intent with that effect vide letter no. DMG/MLS/AUC/'C'-2566/2018-19 dated 07.01.2019 to KFIL and further directed KFIL to submit the required Statutory Clearances to get MDPA signed and start the mining operations (Annexure -1).

Hence, a Mining Plan along with PMCP has been prepared and submitted for approval under Rule 16 of MCR 2016 for 7.57 ha with a production program of 0.130 MTPA as per the CEC approved R&R report of ICFRE (DMG/MLS/R&R/ML-2566/2019-20 dated 07.06.2019, copy enclosed as Annexure-1a,b).

This mining plan has been prepared based on the exploration report by MECL and all the Reclamation and Rehabilitation measures of R&R report have been incorporated appropriately.

The lessee had one more mining lease in the state of Karnataka only. The details of the same are given below:



Table-1:

| Lease ref. no. & date | Area | Postal Address & Location | Type of mineral | Working / Non-working | Status of approval of MP | Date of Execution & Expiry | Remarks |
|-----------------------|----------|--|-----------------|---|---|--|---------------------|
| 2240 dated 23.09.98 | 4.90 Ha | Sy. No.23, Honagadde village, Kushtagi taluk, Koppal dt. | White Quartz | Non- working | Last Scheme of Mining was approved on 20/21.6.2013 Ref No. 279/612/98/ BNG/2386 | Originally executed on 23.09.98 and transferred to KFIL on 29.08.2007. Expiry - 22.09.2018 | Lease under renewal |
| 2245 dated 06.10.18 | 24.47 Ha | Devadarigudda Range Sandur Taluk, Ballari dt. | Iron Ore | Non- Working (Awaiting for lease execution) | Mining Plan approved on 27.5.2019 Ref No. 279/1099/2019/ BNG/665 | Yet to be executed | ----- |

Apart from the above, KFIL also has secured another LoI from the Dept of Mines & Geology (DMG) for another ML block [M/s Bharat Mines & Minerals (ML No.2245) mine lease block in Sandur Taluka, Bellary District Over an extent of 24.47 Ha area of Forest Land of Kumaraswamy range (Devadarigudda)] vide letter no. DMG/MLS/AUC/'C'-2245/2018-19 dated 06.10.2018.



1.0 GENERAL

a)

Table -2:

| | |
|--|--|
| Name of Preferred bidder | M/s Kirloskar Ferrous Industries Ltd. Nominated Owner: Sri Ravindranath Venkatesh Gumaste, MD |
| Mine code and Rule 45 registration no. | Not yet allotted IBM/161/2011 |
| Address | M/s Kirloskar Ferrous Industries Ltd, Laxmanrao Kirloskar Road, Khadki, PUNE-03 |
| District | Pune |
| State | Maharashtra |
| Pin code | 411003 |
| Phone | 08539-286711, 286715 (441) |
| Fax | 08539-286706, 286714 |
| Mobile | 9448491632 |
| E-mail id | Gumaste.rv@kfil.com |

b) Status of applicant/lessee:

Listed Public Limited Company

(Copy of Registration of Company is given in Annexure-2, List of Directors as Annexure-3, Annexure-4 shows a copy of board resolution and Annexure-5 shows photo ID of nominated Owner)

c) Mineral(s) which is are included in the prospecting license (for fresh grant):

Not applicable

d) Mineral(s) which is included in the letter of Intent / lease deed:

Iron Ore

e) Mineral(s) which the lessee intends to mine:

Iron Ore

f) Name of Qualified Persons under Rule 15 of MCR -2016 preparing Mining Plan:

Table -3:

| | | |
|---------------|---|-----------------------------|
| Name | Sripad Pujar | BVR Achar |
| Qualification | M.Sc. (Mineral Exploration) | M.Sc. (Mineral Exploration) |
| Address | ROCK TECH ENTERPRISES 1 st floor, Saphthagiri Enclave, College Road, Hosapete – 583 201, Ballari Dist. Karnataka | |
| Phone | 08394-226563 | |
| Fax | 08394-224012 | |
| Mobile | 9448366964 | 9448469407 |
| E-mail id | rocktechpt@gmail.com | |

(Annexure-6 shows copies of certificates of Qualified Persons)



2.0 LOCATION AND ACCESSIBILITY

a) Lease Details (existing mine)

Table -4:

| | |
|--------------------------------|--|
| Name of the mine | Kirloskar Channakeshava Mines |
| Lat/long of any boundary point | LBS -A Latitude - 13°55'32.259" Longitude - 76°24'42.410" There are 6 corner pillars and lat/long values of these pillars are given in the sketch enclosed as plate I c also listed in Table -6 |
| Date of grant of lease | 07.01.2019 (LoI grant date) |
| Period/Expiry Date | 50 yrs as per MMDR (Amendment) Act-2015 |
| Postal Address | Kirloskar Channakeshava Mines, Near Lakkihalli, Hosadurga taluk |
| District | Chitradurga |
| State | Karnataka |
| Pin code | 577527 |
| Phone | 08539-286711, 286715 (441) |
| Fax | 08539-286706, 286714 |
| Mobile | 9448386711, 9480267877 |
| E-mail id | Srivatsan.rs@kfil.com, Gururaj.agasanoor@kfil.com |

b) Details of applied /lease area with location map (fresh area /mine):

Table-5: Status of Land

| Forest | | Non-forest |
|-------------------------|---------------|----------------|
| Lakkihalli State Forest | Area-7.57 ha. | Not applicable |

Total lease area : 7.57 ha

District & State : Chitradurga, Karnataka

Taluka : Hosadurga

Village : Lakkihalli & Kenkere villages

Whether the area falls under CRZ?

The lease area does not fall under Costal Regulation Zone (CRZ).



Existence of public road/railway line, if any and approximate distance

It is approachable by metalled road both from Hosadurga town via Madadakere village. The distance from Hosadurga is around 23km and Chitradurga is at 55km. The ML is situated at 39 km from Hosadurga road railway station and about 350 km from Mangalore port and Hosadurga is about 21 km from mine gate.

Topo sheet No: 57 C/5

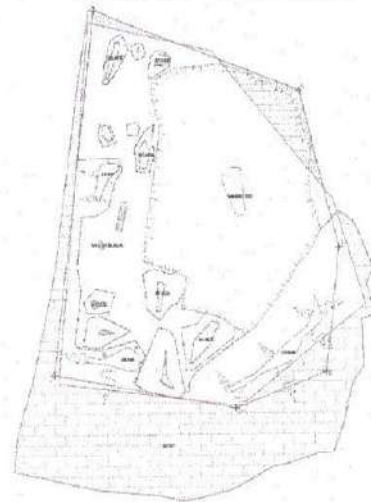
Latitude and Longitude (co-ordinates) of all boundary corner point are given in the following table (WGS-84)

Table -6: Latitude and longitudes of corner pillars as per DGPS

| Sl. No. | CORNER PILLAR No. | Map Datum – WGS84 | | Indian Bangladesh | |
|---------|-------------------|-------------------|-----------------|-------------------|-----------------|
| | | Latitude | Longitude | Latitude | Longitude |
| 01 | LBC-A | 13° 55' 32.2" N | 76° 24' 42.3" E | 13° 55' 27.4" N | 76° 24' 45.9" E |
| 02 | LBC-B | 13° 55' 21.1" N | 76° 24' 41.1" E | 13° 55' 16.3" N | 76° 24' 44.7" E |
| 03 | LBC-C | 13° 55' 20.1" N | 76° 24' 46.9" E | 13° 55' 15.3" N | 76° 24' 50.5" E |
| 04 | LBC-D | 13° 55' 23.3" N | 76° 24' 51.0" E | 13° 55' 27.4" N | 76° 24' 45.9" E |
| 05 | LBC-E | 13° 55' 26.6" N | 76° 24' 50.0" E | 13° 55' 18.5" N | 76° 24' 54.6" E |
| 06 | LBC-F | 13° 55' 31.3" N | 76° 24' 46.5" E | 13° 55' 21.8" N | 76° 24' 53.6" E |

- c) **Attach a general location map showing area and access routes. It is preferred that the area be marked on a Survey of India topographical map or a cadastral map or forest map as the case may be. However, if none of these are available, the area may be shown on an administrative map.**

A general location map is attached as Plate- I a on administrative map and area precise map of 1:50,000 scale as Plate Ib. CEC sketch of the area is enclosed as Plate Ic. Vectorised Satellite imagery (Cartosat-2 with LISS-IV) on the scale of Cadastral Map as on 31st March 2019 will be submitted to IBM within 90 days.





3.0 DETAILS OF APPROVED MINING PLAN:

3.1) Date and reference of earlier approved Mining Plan/Schemes

Not applicable as this is first Mining Plan after lease grant proposal to KFIL.

3.2) Details of last modifications-if any (for the previous approved period) of approved MP/SOM, indicating date of approval, reason for modification

Not applicable as this is first Mining Plan after lease grant proposal to KFIL.

3.3) Review of earlier approved proposal in respect of excavation exploration, reclamation etc.

Not applicable as this is first Mining Plan after lease grant proposal to KFIL.

3.4) Status of compliance of violations pointed out by IBM

Not applicable as this is first Mining Plan after lease grant proposal to KFIL.

3.5) Indicate and give details of any suspension/closure/prohibitory order issued by any Government agency under any rule or Court of law :

Not applicable as this is first Mining Plan after lease grant proposal to KFIL.

3.6) In case the MP/SOM is submitted under rules 9 and 10 of the MCDR'88 or under rule 17(3) of the MCR' 2016 for approval of modification, specify reason and justification for modification under these rules.

Not applicable.



PART – A



1.0 GEOLOGY AND EXPLORATION:

- a) **Briefly describe the topography, drainage pattern, vegetation, climate, and rainfall data of the area applied/mining lease area:**

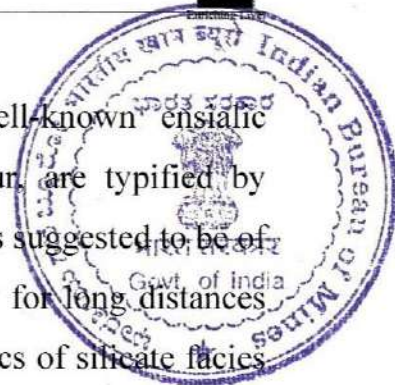
The mining lease is in Lakkihalli state forest, Hiriyur Range, Hosadurga taluk, Chitradurga district, Karnataka state. Physiography of the area is characterized by two elongated ridges trending NW-SE. No major nalla runs through the area. The surface area is covered by float iron and iron ore bands. The area has its highest elevation at about 763m and lowest at about 732m above MSL.

The area of Chitradurga district experience dry semi-arid climate with annual rainfall varying from 500mm to 600mm. The monsoon begins in June first week and continues up to September and winter from the month of October to January is somewhat pleasant However, hot to very hot summer is from the month of February to May.

The area enjoys tropical climate with an annual average rainfall of about 550mm. Maximum temperature in summer days is around 40^o C, and minimum temperature during winter records around 28^o C. Humidity varies between 25 to 85%.

- b) **Brief descriptions of Regional Geology with reference to location of lease/applied area:**

The Chitradurga basin is an elongated narrow belt of 450 kms in length. It narrows southwards and splits up into several linear strips south of Dodguni. The basin is structurally disturbed, followed by later folding and shearing movements and covers an area of about 5550 sq.km. It trends NNW-SSE with an easterly moderate dip. Chitradurga, well known for its gold and copper occurrences, is also home to low grade iron ore deposits, the geological milieu of the Chitradurga schist belt presents an ideal set up for the same.



In the younger greenstones of Dharwar Type, the well-known ensialic intracratonic basins the Shimoga, Chitradurga and Sandur, are typified by distinct Banded Iron formations wherein the source of iron is suggested to be of volcanogenic. The Iron Formations are traced continuously for long distances and this shallow-volcanic platform facies show characteristics of silicate facies with magnetite as the dominant oxide mineral, interbanded with layers rich in iron silicate. In the area, the Sargur Group of rocks along with Peninsular Gneisses is overlain by Chitradurga Group of rocks of Dharwar Supergroup.

The three Formations of the Chitradurga Group namely, Vanivilas, Ingaldhal and Hiriyur have bands of Iron Formation with Mn phyllite. The intercalation of ferruginous shale and remnant BHQ in the ore body has been impersistent.

The mafic complex to the south of Chitradurga town represents one of the thickest accumulations of pillowed tholeiitic basalt associated with pyroclastics. Basement gneiss of smaller dimensions are present. The eastern margin is a thrust contact with mylonite zone. Intrusive granite [2500 Million years] sets the upper limit to the sedimentation. The meta basalts are found in totally different environment and show well preserved pillow and variolitic structures. They are least deformed agglomerates, tuffs and cherts are very common. The associated iron formation is of the sulphide facies. Basalts show excellent quench textures. Metabasalts constitute nearly 60% of the volcanic pile in the lower sections and andesites, rhyolities and pyroclastics in the upper sections. The change of oxide – carbonate facies with chert and manganese ore [gradually subsiding basin] to sulphide facies with carbonaceous shale, chert layers with dominant pyrite is observed in the deeper parts of the Chitradurga basin. Thus, the iron formation appears differently and traced along the strike, having formed under different environments of deposition.

The low-grade granite – greenstone terrain [3500-2500m.y] is the repository of several economically important mineral deposits of iron, manganese, gold, copper, chromium and nickel. Most of the deposits are associated with



greenstone belts. Crustal development is marked by specific mineral deposits characteristic of stage in its evolution. Structure has played an important role by providing suitable dilatant zones of low pressure in which mineralization solutions could migrate. Stratigraphy too has exercised control especially in the localization of deposits of iron and manganese ores.



Table-7: The generalized stratigraphic sequence of Chitradurga belt

| | |
|------------------------|--|
| Hiriyur Formation | Greywacke – argillite suite with volcanics, pyroclastics, cherts and polymict conglomerates. |
| Ingaldhal Volcanics | Basic volcanics and Pyroclastics, acid volcanics, cherts and phyllites. |
| Vanivilas Formation | Iron and manganese formations, limestones, dolomites, phyllites and quartzities. Talya and Dodguni conglomerates. |
| Javanahalli Formations | Amygdular basalt and clastics and associated para gneisses. Neralkattee quartz pebble conglomerate, quartzities |
| | -----Unconformity----- |
| | Basement gneisses |

- c) **Detailed description of geology of the lease area such as shape and size of the mineral/ore deposit, disposition various litho-units indicating structural features if any etc. (Applicable for Mining Plan for grant & renewal and not for Scheme of Mining/Modifications in the approved mining plan/Scheme of Mining).**

The lease area is part of southern extension of the Lakkihalli forest range and trends NW-SE and is part of Vani Vilas Formation. The bedding trend ranges between N10°W - S10°E to N15°E - S15°W with moderate easterly dip. However, westerly dip has also been observed.

The Iron ore is Massive as well as powdery ore/clayey. Other waste rocks are Limonitic clay, Clay and BHQ. The strike length of the ore body is about 340 meters and the width varies from 120 to 180 meters.

Principal ore minerals are hematite + magnetite, goethite and limonite. The grade varies between 45% Fe to 61.57% Fe.

d) (i) **Name of the Prospecting/Exploration Agency:** M/s MECL

(ii) **Address:**

Dr. Babasaheb Ambedkar Bhawan, Highland Drive Road,
Seminary Hills, NAGPUR, Maharashtra

(iii) E-mail id: headbd@mecl.gov.in and phone no: 0712 251 0310



e) **Details of prospecting/exploration already carried out**

i) **Number of pits and trenches indicating dimensions, spacing etc along and across the strike/foliation with reference to geological plan.**

No trenches /pits were carried out.

ii) **Number of boreholes indicating type (Core/RC/DTH), dia, spacing, inclination, Collar level, depth etc with standard borehole logs duly marking on geological plan/sections.**

M/s MECL has drilled 2 nos. of Core drill holes and 4 nos. of RC drill holes during Jan-Feb 2015. These bore holes are marked in Geological Plan and borehole logs are enclosed as Annexure-7.

Table- 8: Details of drilled boreholes

| Borehole no. | Co-Ordinates (WGS-84) | | Level (mRL) | Depth (m) | Inclination |
|--------------|-----------------------|---------|-------------|------------|-------------|
| | Northing | Easting | | | |
| MCK-1 | 1539889 | 652629 | 761.463 | 60 | 90° |
| MCK-2 | 1539675 | 652651 | 758.479 | 40 | 90° |
| MCKR-3 | 1539691 | 652574 | 762.028 | 60 | 90° |
| MCKR-4 | 1539616 | 652625 | 770.425 | 60 | 90° |
| MCKR-5 | 1539763 | 652733 | 755.466 | 68 | 90° |
| MCKR-6 | 1539795 | 652569 | 759.999 | 85 | 90° |
| TOTAL | | | | 373 | |

Note: MCK -Core, MCKR-RC

iii) **Details of samples analysis indicating type of sample (surface/sub-surface from pits / trenches /borehole etc)**

340 borehole samples were analyzed by MECL. (Ann-3B of MECL report).



iv) Expenditure incurred in various prospecting operations:

Cost of exploration (including survey etc) as per LOI of Govt of Karnataka is
Rs. 22,866,113 /- (Annexure-1).

- f) The surface plan of the lease area may be prepared on a scale of 1:1000 or 1: 2000 with contour interval of maximum of 10m depending upon the topography and size of the area duly marked by grid lines showing all features indicated under Rule 28(1)(a) of MCDR 1988.**

Prepared and enclosed as Plate no-II a on a scale of 1:1000

- g) For preparation of geological plan, surface plan prepared on a scale of 1: 1000 or 1: 2000 scale specified under para 1.0 (f) of Part A of the format may be taken as the base plan. The details of exploration already carried out along with supporting data for existence of mineral, locations of proposed exploration, various lithounits along with structural features, mineralized / ore zone with grade variation if any may be marked on the geological plan along with other features indicated under Rule 28 (1)(b) of MCDR 1988:**

Prepared and enclosed as Plate no-II b on a scale of 1:1000

- h) Geological sections may be prepared on natural scale of geological plan at suitable interval across the lease area from boundary to boundary:**

Prepared and enclosed as Plate no-IIc on a scale of 1:1000

- i) Broadly indicate the future programme of exploration with due justification (duly marking on Geological plan year wise location in different colours) taking into consideration the future tentative excavation programme planned in next five years as in table below:**

Most of the area is exposed and MECL has carried out exploration. However, to establish depth persistency of the ore body and to find out any extension of ore body below the existing waste dump, lessee proposes to drill 9 nos. of core bore holes to a total depth of 520m in the first year of this plan period. This drilling program will establish this deposit in G1 category as per the requirement of Rule 12(3) of MCDR 2017. Proposed boreholes tabulated below and the locations of these are marked in the Geological Plan.



Table-9: Proposed Bore Holes

| Borehole no. | Section No. | Co-Ordinates (WGS-84) | | Level (mRL) | Depth (m) | Inclination |
|--------------|-------------|-----------------------|---------|-------------|-----------|-------------|
| | | Northing | Easting | | | |
| PBH-1 | S1-S1' | 1539896 | 652587 | 760.00 | 80.00 | 70° |
| PBH-2 | S2-S2' | 1539834 | 652624 | 733.00 | 50.00 | 90° |
| PBH-3 | S3-S3' | 1539785 | 652615 | 734.00 | 60.00 | 60° |
| PBH-4 | | 1539776 | 652665 | 717.00 | 40.00 | 90° |
| PBH-5 | S4-S4' | 1539741 | 652578 | 755.00 | 70.00 | 90° |
| PBH-6 | | 1539725 | 652662 | 733.00 | 50.00 | 60° |
| PBH-7 | S5-S5' | 1539682 | 652612 | 759.00 | 70.00 | 60° |
| PBH-8 | | 1539671 | 652674 | 758.00 | 50.00 | 60° |
| PBH-9 | S6-S6' | 1539633 | 652527 | 759.00 | 50.00 | 60° |
| TOTAL | | | | | 520.00 | |



- j) **Reserves and Resources as per UNFC with respect to the threshold value notified by IBM may be furnished in a tabular form as given below: (Area explored under different level of exploration may be marked on the geological plan and UNFC code for area considered for different categories of reserve / resources estimation may also be marked on geological cross sections). Submit a feasibility/pre-feasibility study report along with financial analysis for economic viability of the deposit as specified under the UNFC field guidelines may be incorporated.**

Estimation of reserves /resources in MECL report are based on its exploration. The quantum of mineralized zone has been estimated by geological cross section method at threshold cutoff of 45% Fe.

A total of five sections serially numbered S1-S1' to S5-S5' from west to east along N80°W-S80°E have been prepared based on the interpretation of sub surface borehole qualitative data along with surface geological data which is perpendicular to general strike of the ore body. 50m on either side of the iron ore intersection of the borehole has been placed under (G1) and the rest under (G2) category of UNFC. After delineating the limit of the ore zones (>45%) and boundaries of different lithounits, geometry of the ore body have been demarcated and plotted on the respective cross sections. The sectional area of the ore zone and the strike influence of the section has also been computed. Ore resource tonnage has been estimated by multiplying the volume with the tonnage factor of specific gravity of 3.50. The sum has been considered as geological in-situ resources. Correction factor of 1.221 for Thickness of Iron ore in strike direction has been applied. Similarly, a correction factor of 0.82 has been applied to get true thickness. A call factor of 10% reduction has been applied to arrive at net geological reserves.



Table -10: Summary of Mineral Reserves as given in MECL report

| Category | UNFC | | Reserves (Million Tonnes) | |
|------------------------|------|---------|---------------------------|-------------------|
| | MECL | Revised | Geological(1) | Net Geological(2) |
| Proved | G1 | 111 | 2.875 | 2.588 |
| Probable | G2 | 121/122 | 0.658 | 0.592 |
| Total in-situ reserves | | | 3.533 | 3.180 |
| Average grade | | | 51.73 Fe % | |

Table-4, Page No. 24 of MECL Report gives detailed calculation

However, resource/reserves were updated by cross sectional method considering the IBM threshold values (+45% Fe for Iron Ore) based on the level of exploration conducted by MECL. Geological cross sections are prepared at 50 to 100m interval. Sectional areas are calculated, and these areas are multiplied by sectional influence to arrive at the volume of the individual lithology. This volume is multiplied by bulk density to calculate tonnages.

Proved Mineral Reserves (111) are estimated based on G1 level of exploration data (drilling- 50mx100m grid). Proved ore is considered up to the depth of ore intersection in individual boreholes. Actual ore exposure in working pits is also considered as proved ore limit at individual sections. No depth wise influence is considered for estimation of proved mineral reserves.

Probable Mineral Reserves (122) are estimated based on G2 level of exploration data (drilling more than 100m and less than 200m grid). In section S2-S2', the probable mineral reserves are estimated by considering the influence of adjacent section S1-S1' where proved ore is present.

Some portion of the ore is not minable as it is blocked outside the pit limit along the lease boundary in 7.5m safety zone. These are classified as Feasibility Mineral Resources (211). Ore present up to 20-30m below the proved reserves based on the structure of the ore body and of exposed but unexplored mineralized zone is classified as Inferred Mineral Resources (333).



Table 11: Category wise area of Exploration

| Category | Mineralised Area -ha | Non-Mineralised Area-ha | Total -ha |
|------------|----------------------|-------------------------|-----------|
| G1 | 4.0 | 0.63 | 4.63 |
| G2 | -- | -- | -- |
| G3 | -- | -- | -- |
| Unexplored | -- | -- | 2.94 |
| Total | | | 7.57 |

Although MECL has considered Bulk Density as 3.5 tons/cum which is high, a Bulk density of 3.0 tons/cum is considered for iron ore, based on the experience in the sector.

BD for waste is 1.7 tons/cum. Field testing of Bulk Density will be carried out after the execution of the mining lease since it is an auctioned mining lease area. After getting test results intimation will be submitted to IBM and necessary modification- if required- will be done. A recovery of 95% has been considered. Remaining 5% material which is intercalated waste will be separated during crushing/screening and sent for waste dumping.

- k) **Furnish detailed calculation of reserves/resources section wise (When the mine is fully mechanized, and deposit is of complex nature with variation of size, shape of mineralized zones, grade due to intrusion within ore zone etc, an attempt may be made to estimate reserves/resources by slice plan method). In case of deposits where underground mining is proposed, reserve/resources may be estimated by level plan method, as applicable, as per the proposed mining parameters**

Following tables give section wise details of calculation of reserves/resources as on July 2019.

Table-12: Proved Mineral Reserves (111)

| Section | Area sqm | Influ m | Volume cum | BD t/cum | Quantity Tonnes | Recovery 95% |
|--------------|----------|---------|----------------|----------|------------------|------------------|
| S1-S1' | 3185 | 65 | 207025 | 3.0 | 621075 | 590021 |
| S2-S2' | 1190 | 50 | 59500 | 3.0 | 178500 | 169575 |
| S3-S3' | 1940 | 50 | 97000 | 3.0 | 291000 | 276450 |
| S4-S4' | 1250 | 50 | 62500 | 3.0 | 187500 | 178125 |
| S5-S5' | 4776 | 45 | 214920 | 3.0 | 644760 | 612522 |
| Total | | | 640,945 | | 1,922,835 | 1,826,693 |



Table-13: Probable Mineral Reserves (122)

| Section | Area sqm | Influ m | Volume cum | BD t/cum | Quantity Tonnes | Recovery 95% |
|--------------|----------|---------|----------------|----------|-----------------|----------------|
| S2-S2' | 1486 | 50 | 74300 | 3.0 | 222900 | 211755 |
| S3-S3' | 1636 | 50 | 81800 | 3.0 | 245400 | 233130 |
| S4-S' | 2297 | 50 | 114850 | 3.0 | 344550 | 327323 |
| Total | | | 270,950 | | 812,850 | 772,208 |

Table-14: Feasibility Mineral Resources (211)

| Section | Area sqm | Influ m | Volume cum | BD t/cum | Quantity Tonnes | Recovery 95% |
|--------------|----------|---------|---------------|----------|-----------------|----------------|
| S1-S1' | 1345 | 65 | 87425 | 3.0 | 262275 | 249161 |
| S2-S2' | 85 | 50 | 4250 | 3.0 | 12750 | 12113 |
| Total | | | 91,675 | | 275,025 | 261,274 |

Table-15: Inferred Mineral Resources (333)

| Section | Area sqm | Influ m | Volume cum | BD t/cum | Quantity Tonnes | Recovery 95% |
|--------------|----------|---------|----------------|----------|-----------------|----------------|
| S1-S1' | 183 | 65 | 11895 | 3.0 | 35685 | 33901 |
| S2-S2' | 215 | 50 | 10750 | 3.0 | 32250 | 30638 |
| S3-S3' | 295 | 50 | 14750 | 3.0 | 44250 | 42038 |
| S4-S4' | 2589 | 50 | 129450 | 3.0 | 388350 | 368933 |
| S5-S5' | 2165 | 45 | 97425 | 3.0 | 292275 | 277661 |
| Total | | | 264,270 | | 792,810 | 753,170 |

1) Mineral Reserves/Resources:

Mineral Resources: (Mineral resources may be estimated purely based on level of exploration, with reference to the threshold value of minerals declared by IBM)

Table-16: Total resources as on July 2019

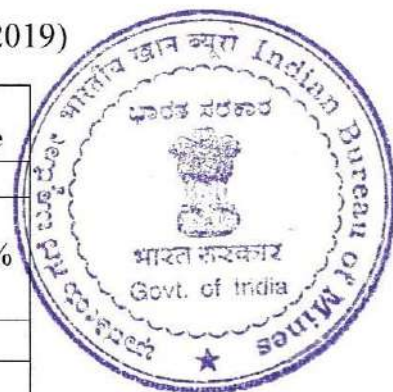
| Level of Exploration | Iron Ore MT | Grade Fe% |
|---------------------------|-------------|-----------|
| G1 - Detailed exploration | 2.088 | 51.73 |
| G2 - General Exploration | 0.772 | |
| G3 - Prospecting | 0.753 | |
| G4- Reconnaissance | - | |

Reserves and resources are arrived after applying results of feasibility and economic evaluation (Pl Annexure-8) based on the various factors such as:

- Open cast mining method, recovery factor as 95%
- Cutoff grade of +45% Fe and ultimate pit depth
- Mineral / ore blocked at lease boundary

Table – 17: Resources and Reserves in tonnes (As on July 2019)

| Category | UNFC | Iron Ore +45% Fe | Avg Grade |
|-------------------------------------|---------|---------------------|--------------|
| A. Total Mineral Reserves | | | |
| Proved Mineral Reserves | G1 -111 | 1,826,693 | 51.73% Fe |
| Probable Mineral Reserves | G2- 122 | 772,208 | |
| <i>Subtotal</i> | | 2,598,901 | |
| B. Total Remaining Resources | | | |
| Feasibility Mineral Resource | G1-211 | 261,274 | - |
| Prefeasibility Mineral Resource | G2-221 | - | - |
| Measured Mineral Resource | G1- 331 | - | - |
| Indicated Mineral Resource | G2- 332 | - | - |
| Inferred Mineral Resource | G3- 333 | 753,170 | - |
| <i>Subtotal</i> | | 1,014,444 | - |
| Grand Total (A+B) | | 3,613,345 | |



Note: It may not be possible to quantify grade wise reserves, as normally there is considerable variation in size and grade distribution within the ore zone, which results variable recovery factor and bulk density. Thus, tonnages arrived are tentative.



2. MINING – OPEN CAST MINING:

A. OPEN CAST MINING:

- a) Briefly describe the existing as well as proposed method for excavation with all design parameters indicating on plans /sections:



Existing: There is only one mine pit (P-1) developed in N-S direction with proper bench heights/berm widths.

Table -18: Existing pit details

| Pit No. | Area (Dimensions) | Top mRL | Bottom mRL | Bench Nos. | Avg. Height | Avg. Width | UTM Co-ordinates | |
|---------|----------------------------|---------|------------|------------|-------------|------------|------------------|---------|
| | | | | | | | Northing | Easting |
| P1 | 02.88 (L 268m x B 108m) | 771 | 718 | 08 | 7m | 7m | 1539647 | 652550 |
| | | | | | | | 1539923 | 652752 |

There is only one waste dump is present and spread all along (within and outside) the lease area except towards NE side which has been named as below.

Table-19: Existing dump details

| Dump No. | Type | Extent ha | Top mRL | Bottom mRL | Stages | Slope degree | Status | UTM Co-ordinates | |
|----------|-----------|-----------|---------|------------|--------|-----------------|----------|------------------|---------|
| | | | | | | | | Northing | Easting |
| ID | Waste | 0.60 | 758 | 751 | 1 | 40 ⁰ | Inactive | 1539716 | 652510 |
| | | | | | | | | 1539943 | 652550 |
| AD | Waste | 0.97 | 760 | 753 | 1 | 40 ⁰ | Active | 1539600 | 652444 |
| | | | | | | | | 1539800 | 652613 |
| SG | Sub grade | 0.83 | 760 | 796 | 2 | 40 ⁰ | Inactive | 1539589 | 652613 |
| | | | | | | | | 1539755 | 652771 |

Note: ID- Inactive dump, AD- Active dump & SG- Sub grade dump (partly in encroached area shown in plate no. IIa)

The SG dump was designated earlier as waste in CEC sketch, but it appears to be having useful material. Hence, now it is named as subgrade dump. (However, ICFRE commented in R&R report that the analysis of this has to be confirmed/ approved by DMG for considering the same as sub-grade or waste depending on the grade. Accordingly, a request is made to DMG for confirmation by sampling and analysis). In case, if the analysis report of DMG clarified it is a waste material then the same will be rechanneled while progressing the working benches. Accordingly necessary modification will be done.



Proposed: Fully mechanized open cast method of mining by drilling and blasting and by deploying HEMM equipment like hydraulic excavators, wheel loaders, tippers, will be undertaken. To make optimum exploitation of the mineral deposit, the mine will be developed by making benches with a height and width of 7m and keeping the necessary berm width. The ROM excavated will be processed in the crushing and screening plants to obtain the lumps and fine ore.

b) Indicate year-wise tentative Excavation in Cubic Meters indicating development, ROM, pit wise as in table below.

I. Insitu Tentative Excavation

Proposed production program will be 1.30 lakh TPA of Iron Ore as per CEC/ICFRE report for this lease.

Table- 21: Year wise Production Program in Cum

| Year | Total tentative Excavation | Top Soil | OB/SB /IB | ROM Iron Ore | Mineral rejects | ROM/ Waste Ratio |
|--------|----------------------------|----------|-----------|--------------|-----------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| First | 48,300 | - | 2,700 | 45,600 | - | 1:0.06 |
| Second | 49,345 | - | 3,750 | 45,595 | - | 1:0.08 |
| Third | 64,105 | - | 18,505 | 45,600 | - | 1:0.40 |
| Fourth | 47,175 | - | 1,600 | 45,575 | - | 1:0.35 |
| Fifth | 64,820 | - | 19,265 | 45,555 | - | 1:0.42 |

Table- 22: Year wise Production Program in tonnes

| Year | Total tentative Excavation | Top Soil | OB/SB /IB | ROM Iron Ore | Mineral rejects | ROM/ Waste Ratio |
|--------|----------------------------|----------|-----------|--------------|-----------------|------------------|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| First | 138,426 | - | 8,466 | 129,960 | - | 1:0.09 |
| Second | 140,196 | - | 10,251 | 129,946 | - | 1:0.08 |
| Third | 165,295 | - | 35,335 | 129,960 | - | 1:0.27 |
| Fourth | 136,483 | - | 6,594 | 129,889 | - | 1:0.05 |
| Fifth | 166,454 | - | 36,623 | 129,832 | - | 1:0.28 |

Table- 23: Calculation of year wise production program

FIRST YEAR

| Iron Ore | | | | | | | Waste | | | | | |
|--------------|----------|---------|--------------|--------------|----------|-----------------|----------|---------|-------------|-------------|-----------------|-------------|
| Section | Area sqm | Influ m | Volume cum | Vol. Rec 95% | BD t/cum | Quantity Tonnes | Area sqm | Influ m | Volume cum | Total Vol* | Quantity Tonnes | Total Waste |
| S1-S1' | 286 | 65 | 18590 | 17661 | 3.0 | 52982 | 0 | 65 | 0 | 930 | 1.7 | 580 |
| S2-S2' | 0 | 50 | 0 | 0 | 3.0 | 0 | 45 | 50 | 2250 | 2250 | 1.7 | 3825 |
| S3-S3' | 75 | 50 | 3750 | 3563 | 3.0 | 10688 | 0 | 50 | 0 | 188 | 1.7 | 319 |
| S4-S4' | 89 | 50 | 4450 | 4228 | 3.0 | 12683 | 0 | 50 | 0 | 223 | 1.7 | 378 |
| S5-S5' | 418 | 45 | 18810 | 17870 | 3.0 | 53609 | 10 | 45 | 450 | 1391 | 1.7 | 2364 |
| Total | | | 45600 | 43320 | | 129960 | | | 2700 | 4980 | | 8466 |

SECOND YEAR

| Iron Ore | | | | | | | Waste | | | | | |
|--------------|----------|---------|--------------|--------------|----------|-----------------|----------|---------|-------------|-------------|-----------------|--------------|
| Section | Area sqm | Influ m | Volume cum | Vol. Rec 95% | BD t/cum | Quantity Tonnes | Area sqm | Influ m | Volume cum | Total Vol* | Quantity Tonnes | Total waste |
| S1-S1' | 182 | 65 | 11830 | 11239 | 3.0 | 33716 | 0 | 65 | 0 | 592 | 1.7 | 1006 |
| S2-S2' | 106 | 50 | 5300 | 5035 | 3.0 | 15105 | 35 | 50 | 1750 | 2015 | 1.7 | 3426 |
| S3-S3' | 156 | 50 | 7800 | 7410 | 3.0 | 22230 | 0 | 50 | 0 | 390 | 1.7 | 663 |
| S4-S4' | 227 | 50 | 11350 | 10783 | 3.0 | 32348 | 40 | 50 | 2000 | 2568 | 1.7 | 4365 |
| S5-S5' | 207 | 45 | 9315 | 8849 | 3.0 | 26548 | 0 | 45 | 0 | 466 | 1.7 | 792 |
| Total | | | 45595 | 43315 | | 129946 | | | 3750 | 6030 | | 10251 |

THIRD YEAR

| Iron Ore | | | | | | | Waste | | | | | |
|--------------|----------|---------|--------------|--------------|----------|-----------------|----------|---------|--------------|--------------|-----------------|--------------|
| Section | Area sqm | Influ m | Volume cum | Vol. Rec 95% | BD t/cum | Quantity Tonnes | Area sqm | Influ m | Volume cum | Total Vol* | Quantity Tonnes | Total waste |
| S1-S1' | 265 | 65 | 17225 | 16364 | 3.0 | 49091 | 137 | 65 | 8905 | 9766 | 1.7 | 16603 |
| S2-S2' | 0 | 50 | 0 | 0 | 3.0 | 0 | 52 | 50 | 2600 | 2600 | 1.7 | 4420 |
| S3-S3' | 90 | 50 | 4500 | 4275 | 3.0 | 12825 | 23 | 50 | 1150 | 1375 | 1.7 | 2338 |
| S4-S4' | 95 | 50 | 4750 | 4513 | 3.0 | 13538 | 0 | 50 | 0 | 238 | 1.7 | 404 |
| S5-S5' | 425 | 45 | 19125 | 18169 | 3.0 | 54506 | 130 | 45 | 5850 | 6806 | 1.7 | 11571 |
| Total | | | 45600 | 43320 | | 129960 | | | 18505 | 20785 | | 35335 |

FOURTH YEAR

| Iron Ore | | | | | | | Waste | | | | | |
|--------------|----------|---------|--------------|--------------|----------|-----------------|----------|---------|-------------|-------------|-----------------|-------------|
| Section | Area sqm | Influ m | Volume cum | Vol. Rec 95% | BD t/cum | Quantity Tonnes | Area sqm | Influ m | Volume cum | Total Vol* | Quantity Tonnes | Total waste |
| S1-S1' | 252 | 65 | 16380 | 15561 | 3.0 | 46683 | 0 | 65 | 0 | 819 | 1.7 | 1392 |
| S2-S2' | 58 | 50 | 2900 | 2755 | 3.0 | 8265 | 0 | 50 | 0 | 145 | 1.7 | 247 |
| S3-S3' | 108 | 50 | 5400 | 5130 | 3.0 | 15390 | 0 | 50 | 0 | 270 | 1.7 | 459 |
| S4-S4' | 309 | 50 | 15450 | 14678 | 3.0 | 44033 | 32 | 50 | 1600 | 2373 | 1.7 | 4033 |
| S5-S5' | 121 | 45 | 5445 | 5173 | 3.0 | 15518 | 0 | 45 | 0 | 272 | 1.7 | 463 |
| Total | | | 45575 | 43296 | | 129889 | | | 1600 | 3879 | | 6594 |

FIFTH YEAR

| Iron Ore | | | | | | | Waste | | | | | |
|--------------|----------|---------|--------------|--------------|----------|-----------------|----------|---------|--------------|--------------|-----------------|--------------|
| Section | Area sqm | Influ m | Volume cum | Vol. Rec 95% | BD t/cum | Quantity Tonnes | Area sqm | Influ m | Volume cum | Total Vol* | Quantity Tonnes | Total waste |
| S1-S1' | 270 | 65 | 17550 | 16673 | 3.0 | 50018 | 95 | 65 | 6175 | 7053 | 1.7 | 11989 |
| S2-S2' | 55 | 50 | 2750 | 2613 | 3.0 | 7838 | 96 | 50 | 4800 | 4938 | 1.7 | 8394 |
| S3-S3' | 115 | 50 | 5750 | 5463 | 3.0 | 16388 | 70 | 50 | 3500 | 3788 | 1.7 | 6439 |
| S4-S4' | 112 | 50 | 5600 | 5320 | 3.0 | 15960 | 22 | 50 | 1100 | 1380 | 1.7 | 2346 |
| S5-S5' | 309 | 45 | 13905 | 13210 | 3.0 | 39629 | 82 | 45 | 3690 | 4385 | 1.7 | 7455 |
| Total | | | 45555 | 43277 | | 129832 | | | 19265 | 21543 | | 36623 |

* Total waste volume includes 5% intercalated waste generated along with ROM

II. Dump re-handling: (for the purpose of recovery of mineral):



No proposals of dump re-handling in this plan period.

- c) **Enclose Individual year wise development plans and sections showing pit layouts, dumps, stacks of mineral reject, if any, etc in case of 'A' category mines. Composite development plans showing pit layouts, dumps, stacks of mineral reject, if any, etc. and year wise sections in case of 'B' category mines.**

Production program proposed as per CEC approved production of 1.30 lakh TPA of iron ore from this mine. Workings will be in the existing pit between sections S1-S1' to S5-S5' and advancement of benches will be towards west. The following table gives year wise details of working levels, location grids, no. of benches in ore/waste etc. Plates III a to e give year wise Production and Development plans and Plate III f shows sections in 1:1,000 scale.

Table-24: Details of workings

| Pit No. | Year | Area Ha | Sections | Advancement | No. of benches | | Level mRL | | UTM Co-ordinates | |
|---------|--------|---------|------------------|-------------|----------------|-------|-----------|-----|------------------|---------|
| | | | | | Ore | Waste | T | B | Northing | Easting |
| P1 | First | 0.51 | S1-S1' to S5-S5' | West | 1 | 0 | 760 | 753 | 1539661 | 652569 |
| | | | | | | | | | 1539923 | 652638 |
| | Second | 0.88 | S1-S1' to S5-S5' | West | 1 | 1 | 760 | 746 | 1539661 | 652556 |
| | | | | | | | | | 1539923 | 652655 |
| | Third | 1.20 | S1-S1' to S5-S5' | West | 1 | 1 | 760 | 746 | 1539661 | 652550 |
| | | | | | | | | | 1539923 | 652655 |
| | Fourth | 1.45 | S1-S1' to S5-S5' | West | 3 | 0 | 760 | 739 | 1539659 | 652550 |
| | | | | | | | | | 1539925 | 652655 |
| | Fifth | 1.73 | S1-S1' to S5-S5' | West | 1 | 2 | 760 | 739 | 1539659 | 652547 |
| | | | | | | | | | 1539926 | 652655 |

Note: separate section lines are drawn instead of following grid lines, since all the drilled boreholes will fall faraway from the grid lines. To utilized the maximum data of boreholes drilled separate section lines are drawn at the interval of 50m across the strike direction of the ore body. This as facilitated estimation of ore reserves accurately. The section lines are shown in Geological plan i.e., plate no IIb and in working plan plate no IIIa to e.

First year production & development:

In the first year of working after execution of lease area the topmost bench of 750mrl will be worked by moving the bench towards western side. About 0.51Ha area around sections S1-S1' to S5-S5' is proposed to work. Their will be one ore bench movement will be carried out. During this year about 1.3 lakh tonnes of ore with corresponding

waste of 8,466 tonnes will be handled. The ore to overburden waste ratio is 1:0.79. The location and level of working is shown in above table.

Second year production & development:

During second year about 0.88 Ha of area around sections S1-S1' to S5-S5' is proposed to produce around 1.3 lakh tonnes of Iron ore and to handle 10,251 tonnes of waste material there will be two benches of working one is ore and another in waste.

The ore to overburden waste ratio is 1:0.08. The location and level of working is shown in above table.

Third year production & development:

During third year working the previous year benches will be moved further to achieve the proposed production of around 1.3 lakh iron ore and 35,335 tonnes of waste material. The ore to overburden waste ratio is 1:0.27. The area of working is same as previous year i.e., around sections S1-S1' to S5-S5'. There will be two beaches of working one is in ore and another is in waste. The working will be 760mrl to 746mrl.

Fourth year production & development:

During fourth year there will be three benches of working will be in ore zone. The proposed production of 1.3 lakh tonnes of iron ore and its corresponding waste handling of 6,594 tonnes of waste material. The ore to overburden waste ratio will be about is 1:0.05. About 1.45 Ha of area around sections S1-S1' to S5-S5' is proposed to work. The coordinates and level of proposed working is shown in above table no 24.

Fifth year production & development:

During fifth year of mining plan period about 1.73 Ha. Of area between sections S1-S1' to S5-S5' is proposed is proposed to work. There will be three benches of movement towards western directions out of which one bench will be in the ore and remaining two will be in waste. The proposed production and its corresponding waste handling are about 1.3 lakh tonnes of iron ore and 36,623 tonnes of waste respectively. The top and bottom of proposed workings is 760mrl and 739mrl respectively. The coordinates of proposed workings are shown is above table no. 24.





d) Describe briefly giving salient features of the proposed method of working indicating Category of mine.

Mining will be carried out in this plan period by fully mechanized (A-category) open cast mining method by making benches of 7m height and width of 7m. Excavators will be used for progressing the benches. Systematic bench formation will be made to rectify old benches. The ore from the pits will be loaded into 16-ton tippers and transported to Crushing/Screening plant. Overall bench slopes will be maintained at 45°. Drilling and blasting technique will be used whenever required to handle hard formation. Since ore deposit is soft to very soft in nature only around 25% of material needs blasting. Waste will be handled by excavators and transported to dump yard by using 16-tons capacity tippers.

Extent of Mechanization:

The mine will be operated by mechanized method. Maximum quantity handled per annum will be 1.30 lakh tonnes of iron ore along with maximum waste of 0.36 lakh tons. Maximum handling will be about 1.66 lakh TPA.

Hydraulic excavators will be used for progressing benches and for handling ore/waste material and tippers of 16tons capacity will be deployed for ore/waste transportation. Drilling and blasting technique will be used whenever required depending up on the hardness of formation.

Other activities like water supply for domestic use, water sprinkling, and afforestation will be carried out by water tankers. Jeeps will be deployed for movement of personnel/staff.

Adequacy of mining equipment:

One excavator of bucket capacity of 0.9cum will be deployed. It can handle about 160 tph. A typical hourly capacity of an excavator is calculated below.

Table -25

| | |
|--|--------------------------------|
| Hourly capacity = $(3600 \times BC \times Sf \times Ff \times Tf \times n) / Ct$ | |
| Where | BC = Bucket capacity = 0.9 cum |
| | Sf = Swell factor = 0.8 |
| | Ff = Fill factor = 0.9 |
| | Tf = Tonnage Factor = 3 |
| | n = Efficiency = 0.8 |
| | Ct = Cycle time = 35 seconds |
| Hence TPH = $(3600 \times 0.9 \times 0.8 \times 0.9 \times 3 \times 0.8) / 35 = 160$ tph | |



Considering 300 working days x 7 hrs/day;

Yearly handling by an excavator = $160 \times 7 \times 300 = 3.36$ lakh tons/annum.

Hence, an excavator is more than enough, as maximum proposed handling will be around 1.66 lakh TPA only. One will be standby.

Table -26: Tipper Requirement for transportation

| Production | | Development | |
|----------------------------------|------------|----------------------------------|------------|
| Production | 1.30 LTPA | Development | 0.36 LTPA |
| Working Days | 300 | Working Days | 300 |
| Production /Day | 433 | Development /Day | 120 |
| Effective working hours/day | 7 | Effective working hours/day | 7 |
| Production/hr | 62 | Production/Hr | 17 |
| Tipper Requirement | | | |
| Production-Lead | 0.5 Km | Lead | 1 Km |
| Speed | 20 Kmph | Speed | 20 Kmph |
| One Trip | 15 minutes | One Trip | 20 minutes |
| No. of Trips /hr | 4 | No of Trips/hr | 3 |
| Effective working hours/day | 7 | Effective working hours/day | 7 |
| Total Material to be handled | 433 tpd | Total Material to be handled | 120 tpd |
| No of trips /day (14 T) | 31 | No of trips /day (14 T) | 9 |
| No of Trips by one tipper /Shift | 28 | No of Trips by one tipper /Shift | 28 |
| No of Tippers Required | 2 | No of Tippers Required | 1 |

Proposed 5 nos. tippers are adequate as two will be standby. Wheel loader will be deployed for maintenance of dumps, feeding plants etc.



Drilling/Blasting:

About 25% material out of total ore handling of 1.66 lakh TPA will require blasting i.e. ~41500 TPA as most of the lithology is soft.

Hence, maximum material to be blasted per day = 41500 tons/300 days
= 138 tpd

Quantity broken/hole = Burden x Spacing x Depth x Avg. Bulk Density
= 2.5 m x 3.0 m x 7m x 3.0 tons / m³
= 157.5 tons/hole

Daily requirement of holes = 138/157.5 = 0.88 (say 1)

But minimum two holes will be drilled per day.

Hence, for a daily requirement of drilling meterage of 14m (2 x 7=14m), one wagon drill will be enough as it can drill 50-60mtrs/shift which is adequate.

However, Blasting will be carried out two to three times per month.



Table-27: List of mining machinery

| Type | Nos. | Size / Capacity | Make | Motive Power |
|--------------------------|------|-----------------|--------------|--------------|
| Wagon drill / Compressor | 1 | 115mm | Atlas Capseo | Diesel |
| Excavator | 2 | 0.9cum | Tata Hitachi | |
| Wheel Loader | 1 | 1.0 cum | HM | |
| Tipper | 5 | 16 tons | Tata | |
| Jeep | 1 | 5 Seater | Mahindra | |
| Water Tanker | 2 | 8000 Ltrs | Tata | |
| DG Set | 1 | 33KVA | Kirloskar | |
| Crusher/Screening plants | 1 | 100 TPH | Power screen | |

Bench height & width shall be maintained at 7m each for easy operation of machinery. So, holes of 7 to 8 m will be drilled with covering inclination and sub-grade drilling. Drill holes in development shall have a spacing and burden of 3m and 2.5m respectively. Charge per hole will be kept at around 30 kgs. Normally two rows of blasting pattern will be adopted to control the ground vibration, back break and noise pollution. Stemming of around 3m will be done to control fly-rock generation. The maximum nos. of holes kept in one blasting will be around 15-20. Use of MS delay detonators & cord relays will help in controlling the vibration and achieve better fragmentation.



Blast initiation in the hole will be done using Nonel BTH shock tube of 25Ms and 42Ms. The powder factor will be around 7 tonnes/kg. Hence the charge per hole will vary from 30kg to 40kg depending on the strata. Slurry explosives will be used for blasting. The lessee will be getting a magazine after start of mine operation. Till such time, Explosive Contractors will be hired.

- e. **Describe briefly the layout of mine workings, pit road layout, the layout of faces and sites for disposal of overburden/waste along with ground preparation prior to disposal of waste, reject etc. A reference to the plans and sections may be given. UPL or ultimate size of the pit is to be shown for identification of the suitable dumping site.**

Mining is proposed in the existing pit by fully mechanized open cast mining method by forming benches of 7m height and width. During this plan period, the work progress will be between section S1-S1' to S5-S5'. Production proposals will be restricted to the area classified under proved reserves (111) category of UNFC. Overall pit slope will be maintained at 45° with horizontal. The slope of the benches will be around 80°. The approach roads for each bench will be made with enough width. In hard to medium hard zone drilling and blasting technique -whenever required- will be adopted. The top most bench will be pushed back to facilitate the formation of benches properly. Ore zone will be excavated and loaded by excavators into dumpers and transported to Crushing/Screening Plant for bifurcation of ROM into calibrated ore and fines. Dumpers are used for loading and dumping of ore / waste material.

Loading will be carried out systematically and care will be taken to prevent spillage and dust generation. All loaded trucks will be covered by tarpaulins to avoid generation of dust during haulage. Other activities like water supply for domestic use, water sprinkling, and afforestation will be done by water tankers.

Total waste generation will be about 97,269 tonnes in this plan period and proposed dumping area of 1.42 ha is enough to accommodate this waste. Waste will be dumped in the south western portion on existing dumps, which is in anti-dip side (footwall) of the ore body, away from UPL and it will be



temporary dumping ground as exploration proposals to check the presence of ore-if any- below this dumping area has been made. After exploration, necessary modifications like backfilling/rehandling will be made -if necessary- in this mining plan and will be submitted for IBM approval. Before dumping in this area, the ground will be levelled and toe wall and garland drains will be constructed. Tippers of 16 tons capacity will be used to transport the waste generated from mine pit to the dump yard.



Table-28: Details of Dumping

| Dump No. | Year | Extent ha | Quantity tonnes | Top mRL | Bottom mRL | Stages Nos. | Slope degree | Status | UTM Co-ordinates | |
|----------|--------|-----------|-----------------|---------|------------|-------------|--------------|--------|------------------|---------|
| | | | | | | | | | Northing | Easting |
| AD | First | 0.17 | 8466 | 770 | 760 | 1 | 45° | Active | 1539604 | 652492 |
| | | | | | | | | | 1539643 | 652548 |
| | Second | 0.23 | 10251 | 770 | 760 | 1 | 45° | | 1539604 | 652496 |
| | | | | | | | | | 1539654 | 652550 |
| | Third | 0.65 | 35335 | 770 | 760 | 1 | 45° | | 1539604 | 652492 |
| | | | | | | | | | 1539738 | 652558 |
| | Fourth | 0.81 | 6594 | 770 | 760 | 1 | 45° | | 1539597 | 652492 |
| | | | | | | | | | 1539738 | 652601 |
| | Fifth | 1.06 | 36623 | 780 | 760 | 2 | 45° | | 1539597 | 652492 |
| | | | | | | | | | 1539738 | 652601 |

Table-28: UPL Parameters

| Pit No. | Pit Area ha | Pit Dimension | | | |
|---------|-------------|---------------|-----------|----------------|-------|
| | | Length (m) | Width (m) | Avg. Depth (m) | Slope |
| P1 | 04.60 | 250 | 184 | 46 | 45° |

Location of proposed workings and dumping are shown in the year wise plans, plate III/a to e, and year wise sections are enclosed as Plate III f.



- f) **Conceptual Mine planning up to the end of lease period taking into consideration the present available reserves and resources describing the excavation, recovery of ROM, Disposal of waste, backfilling of voids, reclamation and rehabilitation showing on a plan with few relevant sections.**

Excavation: Based on the establishment of proved category of reserves after exploration, the mining area as well as ultimate pit limits is designed. In the lease about 4.60 ha area mineralized. Considering the current exploration data and geology, working layout is designed for the proposed production of 1.30 lakh tons of iron ore/annum. In this plan period area of mining will be 3.74 ha that covers a small part of existing waste dump (0.02ha) and 0.84 ha of new area along with existing pit area. In next plan periods mining and concurrent back filling will be taken up. In the conceptual stage, 4.60 ha will be covered under mining and backfilling. All backfilled pits will be reclaimed with plantation.

In the conceptual stage the opened up pit will be partially backfilled and simultaneously afforestation will be taken up. Fencing will be done around the working pit & security will be deployed to prevent any unauthorized persons entering the mining area.

Recovery of ROM: Recovery of ROM from ore zone is considered at 95%.

Disposal of waste dumps:

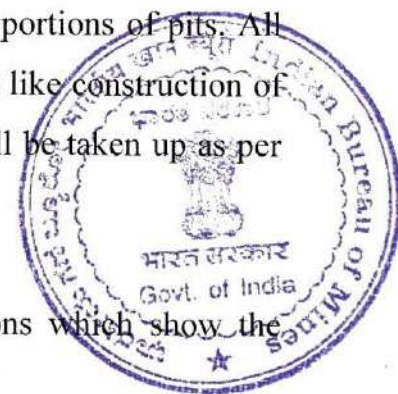
Total waste generation will be about 97,269 tonnes in this plan period and proposed dumping area of 1.42 ha is enough to accommodate this waste as it can hold about 0.112 Mcum. Dumping will be made in stages of 10 m height by providing adequate engineering measures. Waste will be dumped in the south western portion on existing dumps, which away from UPL and it will be temporary dumping ground as exploration proposals to check the presence of ore-if any- below this dumping area has been made.

After exploration, necessary modifications like backfilling/rehandling will be made -if necessary- in this mining plan and will be submitted for IBM approval. In next plan periods and conceptual stage waste will be dumped in



total area of 1.57 ha well as backfilled in the worked-out portions of pits. All backfilled pits will be reclaimed with plantation. Measures like construction of check dam, gully plugs, retaining wall & garland drain will be taken up as per approved R&R plan.

Plate VI a shows the Conceptual Plan with some sections which show the planning as described above.



Sub grade ore: No sub grade ore generation is proposed.

Backfilling of voids: No backfilling program in this plan period.

Reclamation and Rehabilitation:

For protection of the mining area and to prevent further degradation of land and stabilization of dumps, the measures as proposed in the ICFRE R&R report will be carried out.

Land Use Pattern:

Existing land use as well as proposed for this plan period and in conceptual stage is given below:

Table-29: Land Use in Ha

| Type | Existing | Plan period | Pit position at the end of life of mine | Conceptual period |
|--------------------------------|--------------|--------------|---|----------------------------------|
| Mining | 02.88 | 03.74 * | 04.60 * | Partially backfield & afforested |
| Dumping | 01.56 | 01.42 ** | 01.57 ** | Afforestation |
| Statutory building | - | 00.11 \$ | 00.11 | Maintained for watch & ward |
| Crushing/ Screening/Stock yard | - | 0.22 # | 00.22 | Afforestation |
| Stocks/Sub grade dump | 00.81 | 00.81 | - | Afforestation |
| Road | 00.28 | 00.28 | 00.28 | Maintained for watch & ward |
| Safety zone area | 00.79 | 00.79 | 00.79 | Afforestation |
| Untouched area | 01.25 | 00.20 | - | |
| Total | 07.57 | 07.57 | 07.57 | |



Plan period land use breakup details:

* Mining 3.74 Ha. (Existing pit 2.88 Ha., 0.02 Ha from existing waste dump, +0.84 Ha fresh area)

**Waste Dump 1.42 Ha. (Existing waste dump 1.56 Ha., -0.02 Ha used for mining, 0.22 Ha used for Crushing/Screening/ Stock, -0.08 Ha used for infrastructure, +0.18 fresh area)

Crushing/Screening/ Stock yard 0.22 Ha (+0.22 Ha. from existing waste dump)

\$ Infrastructure 0.11 Ha (+0.08 Ha. from existing waste dump, +0.03 fresh area)

Conceptual period land use breakup details:

* Mining 4.60 Ha. (Plan period mining 3.74 Ha., +0.38 Ha. from existing waste dump, +0.38 from Subgrade dump, +0.10 fresh area)

**Waste Dump 1.57 Ha. (Plan period waste dump 1.42 Ha., -0.35 Ha used for mining, +0.25 Ha from Sub grade dump, +0.25 fresh area)

B. UNDERGROUND MINING:

Not applicable



3.0 MINE DRAINAGE:

a. Minimum and Maximum depth of water table based on observations from nearby wells and water bodies:

The water table in the vicinity is about 20-30m below the general ground level of around level of 700mRL.

b. Indicate maximum and minimum depth of workings:

The mining activity will be concentrated on the elevated portions of the hill range. The RL of minimum depth of workings will be 760 mRL and maximum depth of workings will be around 739 mRL in this plan period.

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

There is no chance of encountering ground water during mining as the lowest level in mining will be well above general ground level. Only rainwater drains off from the plateau towards eastern side and goes into valleys.

d. Describe regional and local drainage pattern. Also indicate annual rain fall, catchments area, and likely quantity of rainwater to flow through the lease area, arrangement for arresting solid wash off etc.

Average annual rainfall in area is around 550mm. Whole lease area of 7.57 ha is catchment area for rainfall, hence the likely quantity of rainwater that will be flowing through the lease area will be 0.416 lakh cum (0.55m x 7.57 x10,000). However, for protection of the mining area and for arresting solid wash-off the Surface water management measures have been proposed to implement in the R & R report, they are already discussed in above chapters.



4.0 STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:

a) **Indicate briefly the nature and quantity of top soil, overburden / waste and Mineral Reject to be disposed off:**

The waste rock consists of ferruginous shale/phyllite, limonitic clay/lateritic clay and BHQ No topsoil is expected as mining is proposed in existing workings in this plan period. The physical characteristics of wastes are;

Ferruginous Shale/phyllite: This is mainly friable material with light yellowish to red in colour having fine grains.

BHQ: It is hard and compact layered rock formation with colour ranging from grey to black. The Fe content in this rock is <35%.

Following table gives details of existing dumps and these are marked in Surface Plan, Plate-II a.

| Dump No. | Type | Extent ha | Top mRL | Bottom mRL | Stages | Slope degree | Status | UTM Co-ordinates | | Remarks |
|----------|-----------|-----------|---------|------------|--------|--------------|----------|------------------|---------|--|
| | | | | | | | | Northing | Easting | |
| ID | Waste | 0.60 | 758 | 751 | 1 | 40° | Inactive | 1539716 | 652510 | ID- Inactive dump (presently flat area) |
| | | | | | | | | 1539943 | 652550 | |
| AD | Waste | 0.97 | 760 | 753 | 1 | 40° | Active | 1539600 | 652444 | AD- Active dump |
| | | | | | | | | 1539800 | 652613 | |
| SG | Sub grade | 0.83 | 760 | 796 | 2 | 40° | Inactive | 1539589 | 652613 | SG-Sub grade dump (Partially in encroached area) |
| | | | | | | | | 1539755 | 652771 | |

No mineral rejects generation as all +45% Fe material produced in this plan period is ROM.

Table -34: Year wise quantity in tonnes of Waste and others

| Year | Topsoil | | Waste | | Mineral rejects | | |
|--------|-------------------|---------|-------------|---------|-----------------|---------|---------------|
| | Reuse / Spreading | Storage | Backfilling | Storage | Blending | Storage | Beneficiation |
| First | - | - | - | 8466 | - | - | - |
| Second | - | - | - | 4,534 | - | - | - |
| Third | - | - | - | 10251 | - | - | - |
| Fourth | - | - | - | 3,874 | - | - | - |
| Fifth | - | - | - | 35335 | - | - | - |



- b) **The proposed dumping ground within the lease area be proved for presence or absence of mineral and be outside the UPL unless simultaneous backfilling is proposed or purely temporary dumping for a short period is proposed in mineralized area with technical constraints & justification.**

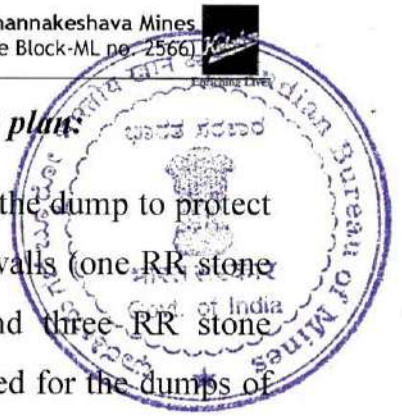
Total waste generation will be about 97,269 tonnes in this plan period and proposed dumping area of 1.42 ha is enough to accommodate this waste. Waste will be dumped in the south western portion on existing dumps, which is in anti-dip side (footwall) of the ore body, away from UPL and it will be temporary dumping ground as exploration proposals to check the presence of ore-if any- below this dumping area has been made. *After exploration, necessary modifications like backfilling/rehandling will be made -if necessary- in this mining plan and will be submitted for IBM approval.* Before dumping in this area, the ground will be levelled and toe wall and garland drains will be constructed.

- c) **Attach a note indicating the manner of disposal of waste, configuration and sequence of year wise build-up of dumps along with the proposals for protective measures.**

Waste will be dumped systematically in stages with average height of 10m with reverse slopes. No sub grade generation will be in this plan period. Year wise dumping details are given below.

Table-35: Details of Dumping

| Dump No. | Year | Extent ha | Quantity tonnes | Top mRL | Bottom mRL | Stages Nos. | Slope degree | Status | UTM Co-ordinates | |
|----------|--------|-----------|-----------------|---------|------------|-------------|--------------|--------|------------------|---------|
| | | | | | | | | | Northing | Easting |
| AD | First | 0.17 | 8466 | 770 | 760 | 1 | 45° | Active | 1539604 | 652492 |
| | | | | | | | | | 1539643 | 652548 |
| | Second | 0.23 | 10251 | 770 | 760 | 1 | 45° | | 1539604 | 652496 |
| | | | | | | | | | 1539654 | 652550 |
| | Third | 0.65 | 35335 | 770 | 760 | 1 | 45° | | 1539604 | 652492 |
| | | | | | | | | | 1539738 | 652558 |
| | Fourth | 0.81 | 6594 | 770 | 760 | 1 | 45° | | 1539597 | 652492 |
| | | | | | | | | | 1539738 | 652601 |
| | Fifth | 1.06 | 36623 | 780 | 760 | 2 | 45° | | 1539597 | 652492 |
| | | | | | | | | | 1539738 | 652601 |



Engineering measures for the waste dumps as per approved R&R plan:

- Toe Wall:** It is a stone masonry wall proposed at the toe of the dump to protect from cutting due to flow of runoff water. A total of 4 toe walls (one RR stone masonry cement sand mortar (1:6) toe wall (TW-1) and three RR stone masonry dry toe walls (TW-2, TW-3 & TW-4) are proposed for the dumps of the mine.
- Garland Drains (Catch Water Drains):** The GDs are proposed at 1-2 m below the toe wall to collect the discharging runoff water at the toe of dump and to carry it safely to STs followed by natural water courses. It should have 2.0 m top width, 1.0 m bottom width and 1.0 m depth. A total of **3 nos. of GDs** are proposed for the dumps of the mine.

Table-36: Engineering measures proposed for waste dump management

| Location | Items | Particulars of works | Dimension in m | | | |
|---------------------------------------|---|---|----------------|-------|--------|--------|
| | | | Length | Width | | Height |
| | | | | Top | Bottom | |
| Proposed Dump | TW-1: Toe wall | Foundation in hard soil mixed with boulders including hard rock | 550.00 | 2.25 | | 0.60 |
| | | Plain cement concrete (1:4:8) in foundation | 550.00 | 1.75 | | 0.15 |
| | | RR Stone masonry in cement sand mortar (1:6) | 550.00 | 1.00 | 2.00 | 1.00 |
| | GD-1: Garland Drain | Garland drain below the toe wall & along the road | 551.00 | 2.00 | 1.00 | 1.00 |
| ID (on NW corner) | TW-2: Toe wall at the toe of waste dump | Foundation in hard soil mixed with boulders including hard rock | 255.00 | 2.00 | | 0.60 |
| | | Plain cement concrete (1:4:8) in foundation | 255.00 | 1.75 | | 0.15 |
| | | RR Stone masonry Dry | 255.00 | 1.00 | 2.00 | 1.00 |
| Encroached dumps (Outside lease area) | TW-3: Toe wall | Foundation in hard soil mixed with boulders including hard rock | 158.00 | 2.00 | | 0.60 |
| | | Plain cement concrete (1:4:8) in foundation | 158.00 | 1.75 | | 0.15 |
| | | RR Stone masonry Dry | 158.00 | 1.00 | 2.00 | 1.00 |
| | TW-4: Toe wall | Foundation in hard soil mixed with boulders including hard rock | 158.00 | 2.00 | | 0.60 |
| | | Plain cement concrete (1:4:8) in foundation | 158.00 | 1.75 | | 0.15 |
| | | RR Stone masonry Dry | 158.00 | 1.00 | 2.00 | 1.00 |
| | GD-3: Garland Drain | Garland drain below the toe wall | 176.00 | 2.00 | 1.00 | 1.00 |
| Along the road | GD-2: Garland Drain | Garland drain below the toe wall | 332.00 | 2.00 | 1.00 | 1.00 |



5.0 USE OF MINERAL:

- a) Describe briefly the requirement of end-use industry specifically in terms of physical and chemical composition.

Since this mine is a captive mine, entire production will be utilized as raw material by KFIL plant.

- b) Give brief requirement of intermediate industries involved in up-gradation of mineral before its end-use:

No involvement of any intermediate industries before its end use.

- c) Give detail requirements for other industries, captive consumption, export, associated industrial use etc.

No such use is envisaged as all ROM is expected to be consumed directly in the plant of KFIL.

- d) Indicate precise physical and chemical specification stipulated by buyers:

Table – 37:

| Category | Grade | Size in mm |
|----------------|---------|------------|
| Calibrated ore | +45 Fe% | +10 -30/40 |
| Fines | +45 Fe% | -10mm |

- e) Give details of processes adopted to upgrade the ROM to suit the user requirements:

No upgradation. Only dry processing of ROM by mobile crushing and screening plant into different sizes like -10mm & +10-30/40mm calibrated ore.





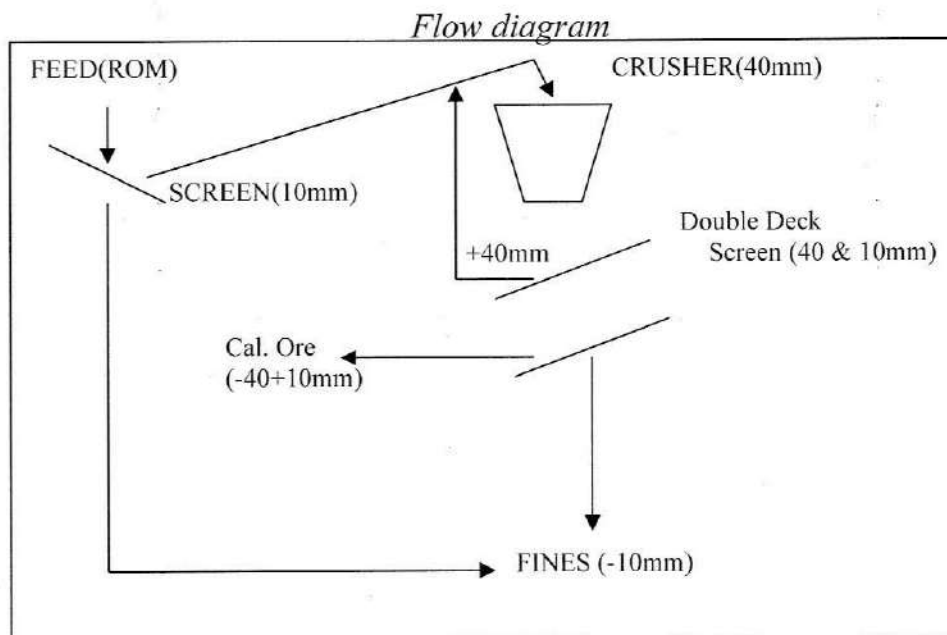
6.0 PROCESSING OF ROM AND MINERAL REJECT:

- a) **If processing / beneficiation of the ROM or Mineral Reject is planned to be conducted, briefly describe nature of processing / beneficiation. This may indicate size and grade of feed material and concentrate (finished marketable product), recovery etc.**

No wet mineral processing, only dry crushing and screening of iron ore for size separation of ore as per plant's requirement. A mobile Crushing (jaw crusher) and Screening Plant of 100ph will be deployed.

- b) **Give a material balance chart with a flow sheet or schematic diagram of the processing procedure indicating feed, product, recovery, and its grade at each stage of processing.**

In the plants, the ROM of Iron ore shall be separated first into -10mm and $+10\text{mm}$ material by screening. $+10\text{mm}$ will be crushed in the crusher, set to crush at 40mm . The crushed material will be screened on 40mm and 10mm screens and material of $-40\text{mm}+10\text{mm}$ and -10mm will be sent to plant as Calibrated Ore and Fines respectively. The lumps if required are crushed to -40mm size and then screened.



The likely material balance of this processing of ROM will be as follows.

Table -38:

| Description | Rate |
|--------------------|---------|
| Feed (ROM) | 100 tph |
| Cal. Ore(-40+10mm) | 30 tph |
| Fines (-10mm) | 70 tph |



- c) **Explain the disposal method for tailings or reject from the processing plant.**

No rejects are generated.

- d) **Quantity and quality of tailings /reject proposed to be disposed, 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 tailings dam.**

No rejects are generated.

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

No processing plant is proposed.

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

Not applicable.

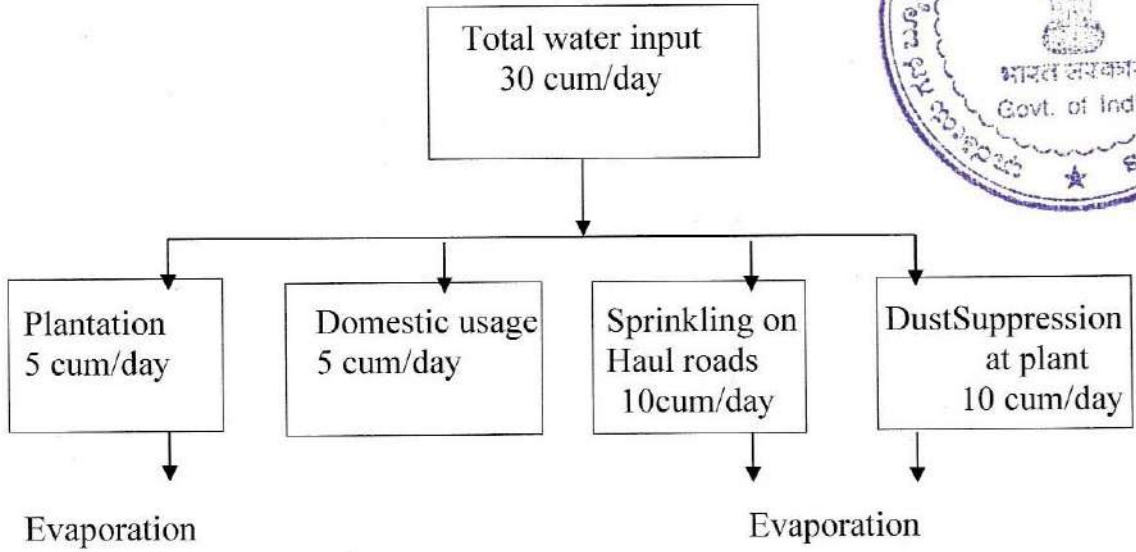
- g) **Indicate quantity (cum per day) of water required for mining and processing and sources of supply of water, disposal of water and extent of recycling. Water balance chart may be given.**

No water is required for processing except dust suppression. Other usages of water in the mine will be for dust suppression, afforestation and domestic use.

Water is sourced from bore wells located in the nearby village of Ranjitpur.



Water Balance Chart





7.0 OTHERS:

a) Site Services & Infrastructure:

All the required infrastructural facilities like office, resting area, canteen, water facilities etc will be set up inside lease area. The nearest railway station is at Hosadurga on Bengaluru-Harihar broad-gauge line of SWR at about 40km. It is about 350 km from Mangalore port and Hosadurga is about 21 km from mine gate which is having all facilities like Police Station, Hospital, Post Office, School, Workshops etc.

b) Employment potential:

Table – 39: Details of Employment

| Category | Nos. |
|----------------|-----------|
| Highly Skilled | 3 |
| Skilled | 14 |
| Semi-Skilled | 4 |
| Total | 21 |

| Sl. No | Description | Nos. | Sl. No | Description | Nos. |
|-------------------|-----------------|------|--------|-------------|------|
| 1 | Mine Manager | 1 | 6 | Mechanic | 1 |
| 2 | Mining Engineer | 1 | 7 | Supervisors | 4 |
| 3 | Geologist | 1 | 8 | Drivers | 5 |
| 4 | Foremen | 1 | 9 | Operators | 2 |
| 5 | Mining Mate | 1 | 10 | Helpers | 4 |
| Total - 21 | | | | | |

8.0 PROGRESSIVE MINE CLOSURE PLAN UNDER RULE 23 OF MCDR'1988

8.1 Environment Base line information:



Table-40: Existing land use

| Type | Area-Ha |
|------------------|-------------|
| Mining | 2.88 |
| Dumping | 1.56 |
| Mineral stock | 0.81 |
| Roads | 0.28 |
| Safety zone area | 0.79 |
| Untouched area | 1.25 |
| Total | 7.57 |

Water Regime:

No perennial rivers/nallahs or springs present in the area. Only some *nallahs* are present culminating into small tanks and ponds. Most of the water is sourced from Ground water resources only. Water table is about 20-30m below the general ground level and the chance of encountering the same during mining on the hill ridge is nil.

Quality of air:

And

Ambient noise level:

The mine is not operating since 2011 and this lease has been awarded to KFIL Ltd through auction. Once the mine operation begins, lessee will conduct environmental monitoring and all data will be submitted IBM regularly.

Flora:

The mining area has some vegetation with small trees along with shrubs and bushes. The major species of flora in the mining area are;



Acacia catechu, Acacia chundra, Ailanthus, Annona, Azadirachta indica, Buchanania lanzan, Dolichandrone atrovirens, Cassia fistula, Chloroxylon swietenia, Diospyros melanoxylon, Garuga pinnata, Hardwickia ercul, Holarrhena pubescens, Ixora pavetta, Lagerstroemia parviflora, Lannea coromandelica, Mitragyna parvifolia, Morinda pubescens, Polyalthia cerasoides, Santalam album, Soyimida febrifuga etc.

Dominant grass specie occurring in the mine lease area and surroundings are Aristida adscensionis, Aristida setacea, Dactyloctenium aegyptium Cymbopogon martini and Heteropogon contortus. (Source: R&R- ICFRE)

Fauna: Some important species of mammals, reptiles and birds are;

- i) *Mammals: Antelope cervicarpa, Panthera pardus, Manis crassicaudata; Macaca radiate, Semnopithecus entellus, Felis chaus, Viverricula indica; Muntiacus muntjak, Sus scrofa.*
- ii) *Reptiles: Ptyas mucosa, Daboia russelii, Naja naja, Xenochrophis piscator, Geochelone elegans, Varanus bengalensis and other Psammophilus dorsalis, Chamaeleo zeylanicus.*
- iii) *Birds: Pavo cristatus, Ciracias benghalensis, Megalaima haemacephala, Megalaima zeylanica, Alcedo, Perdicula aegoondab, Coturnix coromandelica, Centropus sinensis, Halcyon smyrnensis, Eudynamys scolopacea, Merops orientalis, etc. (Source: R&R report of ICFRE)*

Climatic conditions:

The area enjoys tropical climate with an annual average rainfall of about 500-600mm. Maximum temperature in summer days is around 40^o C, and minimum temperature during winter nights records between 12 – 18^o C. Humidity varies between 25 to 85%.



Human Settlement:

No human settlement exists inside mining area. There are about 34 villages situated within the buffer zone, with total population of 30,552 as per the census data.

Table -41

| SL.No. | Village | Population (Male) | Population (Female) | Total Population | Direction | Distance (km) |
|--------|-------------------|-------------------|---------------------|------------------|-----------|---------------|
| 1 | Aiyanahalli | 163 | 161 | 324 | SE | 6 |
| 3 | Balugatte | 356 | 324 | 680 | NE | 8.6 |
| 5 | Bevinahalli | 168 | 203 | 371 | SE | 8.9 |
| 6 | Bharamagiri | 1422 | 1331 | 2753 | NE | 9.1 |
| 9 | Doddakittadahalli | 417 | 409 | 826 | NW | 5.5 |
| 10 | Gulihosahalli | 613 | 607 | 1220 | NW | 7.4 |
| 11 | Hanumanahalli | 646 | 633 | 1279 | NW | 4.3 |
| 12 | Hullukatte | 235 | 254 | 489 | SW | 8.6 |
| 16 | Kenkere | 434 | 458 | 892 | SW | 3.5 |
| 17 | lakahalli | 1667 | 1628 | 3295 | NE | 3.7 |
| 18 | Madadakere | 1013 | 1076 | 2089 | SW | 4.7 |
| 19 | Malapur | 397 | 430 | 827 | SW | 6.6 |
| 23 | Naganahatti | 443 | 440 | 883 | SE | 4.1 |
| 24 | Nakkikere | 636 | 633 | 1269 | NW | 9 |
| 25 | Oblapur | 859 | 813 | 1672 | SW | 8.2 |
| 27 | Ramajanaahalli | 851 | 834 | 1685 | SW | 6.2 |
| 28 | Ranganahalli | 1332 | 1260 | 2592 | SW | 8.4 |
| 29 | Sannakittadahalli | 940 | 868 | 1808 | NW | 4.96 |
| 30 | Siranakatta | 1170 | 1155 | 2325 | SE | 4.2 |
| 32 | Vadarahalli | 134 | 125 | 259 | NE | 7 |
| 33 | Vanivilasapura | 1355 | 1296 | 2651 | SE | 8.9 |
| 34 | Viranagattihalli | 180 | 183 | 363 | SW | 7.7 |
| | TOTAL | 15431 | 15121 | 30552 | | |

Public buildings, Places of worship & Monuments:

There is no public building or monuments within the lease area.

Any Sanctuary located in the vicinity of leasehold:

There is no sanctuary located near the lease area.

8.2 Impact Assessment:

i) Land area indicating the area likely to be degraded due to mining, dumping, roads, workshop, processing plant, tailing pond/dam, township etc. :

Due to the mining activity, there will be change in ground profile, due to pits, dumps and other allied activities. The land use likely to be degraded in this mining lease is given below:

Table-42: Land Use in ha

| Type | Existing | Plan period | Pit position at the end of life of mine | Conceptual period |
|---------------------------------|--------------|--------------|---|----------------------------------|
| Mining | 02.88 | 03.74 * | 04.60 * | Partially backfield & afforested |
| Dumping | 01.56 | 01.42 ** | 01.57 ** | Afforestation |
| Statutory building | - | 00.11 \$ | 00.11 | Maintained for watch & ward |
| Crushing/ Screening/ Stock yard | - | 0.22 # | 00.22 | Afforestation |
| Stocks/ Sub grade dump | 00.81 | 00.81 | - | Afforestation |
| Road | 00.28 | 00.28 | 00.28 | Maintained for watch & ward |
| Safety zone area | 00.79 | 00.79 | 00.79 | Afforestation |
| Untouched area | 01.25 | 00.20 | - | |
| Total | 07.57 | 07.57 | 07.57 | |

Plan period land use breakup details:

* Mining 3.74 Ha. (Existing pit 2.88 Ha., 0.02 Ha from existing waste dump, +0.84 Ha. fresh area)

**Waste Dump 1.42 Ha. (Existing waste dump 1.56 Ha., -0.02 Ha used for mining, -0.22 Ha used for Crushing/ Screening/ Stock, -0.08 Ha used for infrastructure, +0.18 fresh area)

Crushing/Screening/ Stock yard 0.22 Ha (+0.22 Ha. from existing waste dump)

\$ Infrastructure 0.11 Ha (+0.08 Ha. from existing waste dump, +0.03 fresh area)

Conceptual period land use breakup details:

* Mining 4.60 Ha. (Plan period mining 3.74 Ha., +0.38 Ha. from existing waste dump, +0.38 from Subgrade dump, +0.10 fresh area)

**Waste Dump 1.57 Ha. (Plan period waste dump 1.42 Ha., -0.35 Ha used for mining, +0.25 Ha form Sub grade dump, +0.25 fresh area)

The mining pits are present in the lease area serving as production benches. The major impacts observed include soil erosion, loss of topsoil, creation of pits and deforestation and possibility of adding silt load in the natural nallah nearby the lease area.

ii) Air quality:

The semi arid climatic condition of the area coupled with mining activities on the top of the hills through open-cast, contributes to air pollution. The dust is observed to be the predominant air pollutant when the mining is in operation.

**iii) Water quality:**

The major impact on water pollution is due to erosion of waste dump and sub-grade dump, oil and grease, contamination of water bodies due to discharge of mine water/effluent and sedimentation of the seasonal nallahs flowing nearby.

**iv) Noise levels:**

Noise pollution by mining activities is mainly because of excavation, handling and transportation of ore and overburden and operation of processing equipment.

v) Vibration levels (due to blasting):

Very little drilling and blasting activities are proposed and hence no major impact from drilling / blasting.

vi) Water regime:

There is no seepage water and there is no water table in the vicinity as the lowest level in mining will be well above the ground level. Monsoon water gets drained through seasonal nallahs joins nearby tank.

vii) Acid mine drainage:

Not applicable as no acidic material is present in the mining area.

viii) Surface subsidence:

Not applicable as it is opencast mining in a stable area.

vii) Socio-economics:

The mining will bring positive effect by way of generation of employment and business opportunities to local people. Apart from this lessee will undertake CSR activities focusing on measures to improve education, health, literacy of the people of surrounding villages.



viii) *Historical monuments etc.*

There are no public buildings, places of worship or monuments are located near the lease area.



Mitigative measures:

Air: It is proposed to deploy Water Tankers to suppress the dust by regular water spraying on all the roads used for haulage and around Crushing Screening Plant. Plantation will be carried out as green belt all along the lease boundary which act as wind breaks.

Water: For protection of the mining area and for arresting solid wash-off the surface water management measures of R&R report will be implemented.

Noise: The management plan for controlling noise pollution are providing noise insulation/padding in plants and machinery wherever practicable, limiting of speed of haulage vehicles/tippers, proper maintenance of noise generating parts of the machine, provision of earmuffs to workers as a measure to protect their ears etc.

8.3 Progressive Reclamation Plan:

8.3.1 Mined-out land:

No proposal of backfilling as no mining area will be exhausted in this plan period. However, for protection of the mining area and to prevent further degradation of land and stabilization of dumps, the following measures are proposed.

8.3.2 Topsoil Management:

No topsoil is expected as proposed mining area is within the worked out pits. However, if any topsoil is encountered it will be used for plantation.

8.3.3 Tailing Dam Management:

No proposals as no tailing dam is present or proposed.

8.3.4 Acid mine drainage, if any and its mitigative measures:

Not applicable as no acidic material is present in the mining area.

8.3.5 Surface subsidence mitigation measures:

Not applicable as the proposal is for opencast mining in a stable area.



Table-43: Summary of year wise proposal for item No. 8.3

| Items | Details | Actual Position (as on July-19) | First | Second | Third | Fourth | Fifth | Remarks |
|---|---|------------------------------------|-------------------|-------------------------------|-------|--------|-------|---------|
| Dump management | Area afforested (ha) | | - | - | - | - | - | - |
| | No. of saplings planted | | - | - | - | - | - | - |
| | Cumulative no. of plants | | - | - | - | - | - | - |
| | Cost including watch and care during the year | | - | - | - | - | - | - |
| Management of worked out benches | Area available for rehabilitation(ha) | -- | - | - | - | - | - | - |
| | Afforestation done (ha) | -- | - | - | - | - | - | - |
| | No of saplings planted | -- | - | - | - | - | - | - |
| | Cumulative no of plants | -- | - | - | - | - | - | - |
| | Any other method of rehabilitation (specify) | -- | - | - | - | - | - | - |
| | Cost including watch and care during the year | -- | - | - | - | - | - | - |
| Reclamation and Rehabilitation by backfilling | Void available for Backfilling – in ha | -- | - | - | - | - | - | - |
| | Void filled by waste/tailings(Area in Ha) | - | - | - | -- | - | - | - |
| | Afforestation on the backfilled area | -- | - | - | - | - | - | - |
| | Rehabilitation by making water reservoir | -- | - | - | - | - | - | - |
| | Any other means (specify) | -- | - | - | - | - | - | - |
| Rehabilitation of waste land within lease | Area available (ha) | -- | - | - | - | - | - | - |
| | Area rehabilitated | -- | - | - | - | - | - | - |
| | Method of rehabilitation | -- | - | - | - | - | - | - |
| Others (specify) | Greenbelt plantation-ha | | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | |
| | No. of plantation | | 175 | 175 | 175 | 175 | 175 | 80% |
| | Greenbelt plantation -cost (lakh Rs.) | | 0.40 | 0.40 | 0.40 | 0.40 | 0.40 | |
| | Engineering structures for waste dump management- | Retaining wall (RW) | 1(551m X 1.5mX 1m | Structures will be maintained | | | | |

| cost (lakh Rs.) | Garland drain (GD) | 1(550m X 1.5m X 1m) | Structures will be maintained | | | | |
|--|---------------------------------------|------------------------------|-------------------------------|-------------------------|-------------------------|-------------------------|--|
| | | | 22.41 | | | | |
| Engineering structures for Surface water management-cost(lakh Rs.) | LBCD | 13 nos. (6-8m X 1-2m X 1m) | Structures will be maintained | | | | |
| | SMCD | 2 nos. (10m X 1.5-3m X 1.5m) | Structures will be maintained | | | | |
| | RWHP | 2 nos. (10m X 10-5m X 3m) | Structures will be Maintained | | | | |
| | BWCD | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | |
| | LWCD | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | 8 nos. (2 m X 1.5 X 1m) | |
| | | | | 15.43 | | | |
| Env. monitoring | Will be carried out as per guidelines | | | | | | |

Engineering measures proposed in the ICFRE R & R Plan:

The R&R plan includes a variety of engineering structures encompassing toe walls, garland drains, check dams, rainwater harvesting pits, silt settling tanks, etc., proposed for the protection of inactive and encroached waste dumps and the nalas in the lease area. The details are summarized in next pages.

Engineering measures for the waste dumps:

- Toe Wall:** It is a stone masonry wall proposed at the toe of the dump to protect from cutting due to flow of runoff water. A total of 4 toe walls (one RR stone masonry cement sand mortar (1:6) toe wall (TW-1) and three RR stone masonry dry toe walls (TW-2, TW-3 & TW-4) are proposed for the dumps of the mine.



- **Garland Drains (Catch Water Drains):** The GDs are proposed at 1-2 m below the toe wall to collect the discharging runoff water at the toe of dump and to carry it safely to STs followed by natural water courses. It should have 2.0 m top width, 1.0 m bottom width and 1.0 m depth. A total of 3 nos. of GDs are proposed for the dumps of the mine.

Engineering measures for the surface water management:

- **Loose Boulder Check Dam (LBCD):** The LBCDs are Random Rubble Dry Stone Masonry in nature and are usually proposed for gullies having a width of about 5-10 m and bed slope of less than 10%. A total number of 13 LBCDs are proposed for the nalas originating from the ML area.
- **Stone Masonry Check Dam (SMCD) - cement sand mortar (1:6):** This is usually considered as a key structure constructed at the end of all the gully control structures like LBCD, GCD, etc. A total number of 2 SMCDs are proposed for the nalas originating the lease area (**Design-3**).
- **Log Wood Check Dam (LWCD):** These structures are proposed in narrow gullies having a width of about 3-6 m. For LWCD, wooden logs of sprouting species needs be inserted up to a depth of about 30 cm in series at distance of about 30 cm from centre to centre. Boulders of 40 cm size and above may be hand packed between risers and logs up to 1.0 m depth. A total number of 40 LWCDs are proposed for the gullies that may be formed on waste dumps during the plan period and at the Conceptual Stage.
- **Brush Wood Check Dam (BWCD):** It is proposed for narrow gullies of about 1-3 m wide and is suitable for the areas where boulders are not available. It is essentially like logwood check dam and in this, brush woods such as branches, twigs, climbers, etc., are used instead of wooden logs. Altogether, 40 BWCDs are proposed for the gullies that may be formed on waste dumps during the plan period and at the Conceptual Stage.



Water harvesting structures:

- **Rain Water Harvesting Pit (RWHP):** Altogether, 2 RWHPs are proposed for the nalas originating from the lease area.
- **Silt Trap (ST):** One ST is proposed for the trench on the EID-1.
- **Hume Pipe Culvert (HPC):** Two HPCs of a diameter of 1.0 m and length of 15 & 20 m each are proposed on Nala-2 across approach road.

Table-44: Proposed bio-engineering measures

| Location | Items | No. | Dimension in m | | | |
|-----------------------------|-----------------------------|------|----------------|----------------|--------|--------|
| | | | Length | Width | | Height |
| | | | | Top | Bottom | |
| N-1 | LBCD-1 | 1.0 | 6.00 | 1.00 | 2.00 | 1.00 |
| | LBCD-2 | 1.0 | 8.00 | 1.00 | 2.00 | 1.00 |
| | SMCD-1 | 1.0 | 10.00 | 1.50 | 3.00 | 1.50 |
| | RWHP-1 | 1.0 | 10.00 | 10.00 | 5 x 5 | 3.00 |
| N-2 | Hume pipe culvert-1: | | 15.00 | 1.0 m diameter | | -- |
| | LBCD-3 | 1.0 | 6.00 | 1.00 | 2.00 | 1.00 |
| | LBCD-4 | 1.0 | 8.00 | 1.00 | 2.00 | 1.00 |
| | Hume pipe culvert-2: | | 20.00 | 1.0 m diameter | | -- |
| N-3 | LBCD-8 | 1.0 | 6.00 | 1.00 | 2.00 | 1.00 |
| | LBCD-9 | 1.0 | 8.00 | 1.00 | 2.00 | 1.00 |
| | LBCD-10 | 1.0 | 8.00 | 1.00 | 2.00 | 1.00 |
| N-4 | LBCD-11 | 1.0 | 6.00 | 1.00 | 2.00 | 1.00 |
| | LBCD-12 | 1.0 | 8.00 | 1.00 | 2.00 | 1.00 |
| | LBCD-13 | 1.0 | 8.00 | 1.00 | 2.00 | 1.00 |
| N-5 | SMCD-2 | 1.0 | 10.00 | 1.50 | 3.00 | 1.50 |
| | RWHP-2 | 1.0 | 10.00 | 10.00 | 5 x 5 | 3.00 |
| Proposed on all waste dumps | Brush Wood Check Dam (BWCD) | 10.0 | 2.00 | - | 1.50 | 1.00 |
| | | 10.0 | 3.00 | - | 1.50 | 1.00 |
| | | 10.0 | 4.00 | - | 1.50 | 1.00 |
| | | 10.0 | 5.00 | - | 1.50 | 1.00 |
| | Log Wood Check Dam (LWCD) | 10.0 | 4.00 | - | 2.00 | 1.00 |
| | | 10.0 | 5.00 | - | 2.00 | 1.00 |
| | | 10.0 | 6.00 | - | 2.00 | 1.00 |
| | | 10.0 | 7.00 | - | 2.00 | 1.00 |

Table -45: Implementation Schedule of Engineering Measures

| Type | Particulars of work | Years | | | | |
|--|-----------------------------------|-------|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| Inactive/Encroached dump | Toe wall at the toe of waste dump | √ | | | | |
| | Garland drain | √ | | | | |
| Active/Proposed Dump | Toe wall at the toe of waste dump | √ | √ | √ | √ | √ |
| | Garland drain | √ | √ | √ | √ | √ |
| Gully plugs | Logwood Check Dams | √ | √ | √ | √ | √ |
| | Brushwood Check Dam | √ | √ | √ | √ | √ |
| Check dams (For Nalas) | Loose Boulder Check Dam | √ | | | | |
| | Stone Masonry Check Dam | √ | | | | |
| | Rain Water Harvesting Pit | √ | | | | |
| | Silt Trap | √ | | | | |
| | Hume Pipe Culvert | √ | | | | |
| Greenbelt development | | √ | √ | √ | | |
| Afforestation | | √ | √ | √ | √ | √ |
| Environmental monitoring & watch –ward | | √ | √ | √ | √ | √ |

Note- Maintenance of all engineering and biological measures will be done in subsequent year

Table-46: Summary of the cost of proposed measures

| Sl. No. | Item of work | Cost (Lakh Rs.) |
|--------------------|---|------------------|
| 1. | Rehabilitation of encroachment area (afforestation) | 6.80 |
| 2. | Engineering structures for waste dump management | 22.41 |
| 3. | Engineering structures for Surface water management | 15.43 |
| 4. | Afforestation of area under green belt | 2.03 |
| 5. | Total afforestation of the area at the conceptual stage | 11.80 |
| Grand Total | | Rs. 58.47 |

8.4 Disaster Management and Risk Assessment:

The disaster and the risk may occur due to natural calamity such as earth quake, land slide, collapse etc. However, in such cases, the emergency services required for help like Police Station, Fire Station, Hospital, Ambulance services and its contact numbers will be made available with the Mines Manager.

Address for contact during emergency:

Mr. Gururaj –Cell: 9480267877, Mines Manager,

Kirloskar Channakeshava Mines, Hosadurga tq. Chitradurga dt.



Disposal of Mining Machinery:

The mine operation will be mechanized and most of the required machineries / trucks will be on hire.

Safety and Security:

The required safety measures such as fencing the pit, maintaining the proper gradient of haul roads on the mine benches, maintaining the pit slope of 26 degrees and providing the safety equipment will be strictly adhered. As a part of security, guards will be deployed for watch and ward around the clock.

8.5 Care and Maintenance during temporary discontinuance:

During such time, the area will be closed at gates and temporary staff will be arranged for care and maintenance.

8.6 Financial Assurance:

Not applicable, as this lease is granted after auction wherein a MDPA will be signed between lessee and GoK.

However, area proposed to put into use in this plan period as stated in Rule 27 of MCDR 2017 will be 7.37 ha.

Table-48: Area put to use in this plan period

| Sl. No. | Type of Land Use | Area of land use (in ha) | | | The area (in ha) considered as fully reclaimed & rehabilitated | Net area (ha) considered for calculation of financial assurance |
|---------|-----------------------|----------------------------------|---|------------------------------|--|---|
| | | Area put on use at start of plan | Additional requirement during plan period | As at the end of Plan period | | |
| | 1 | 2 | 3 | 4 | 5 | 6 |
| 1 | Area under mining | 02.88 | +00.86 | 03.74 | -- | 03.74* |
| 2 | Storage for topsoil | - | - | - | -- | - |
| 3 | Overburden dump | 01.56 | -00.14 | 01.42 | -- | 01.42** |
| 4 | Stock/ Sub Grade dump | 00.81 | - | 00.81 | -- | 00.81 |
| 5 | Statutory Buildings | - | +00.11 | 00.11 | -- | 00.11 ^s |
| 6 | Roads | 00.28 | - | 00.28 | -- | 00.28 |
| 7 | Railways | - | - | - | -- | - |

| | | | | | | |
|----|----------------------------|--------------|--------|--------------|-----|--------|
| 8 | Green belt / safety zone | 00.79 | - | 00.79 | - | 00.79 |
| 9 | Crushing / Screening plant | - | +00.22 | 00.22 | - | 0.22 # |
| 10 | ETP | - | - | - | - | - |
| 11 | Township area | - | - | - | - | - |
| 12 | Biodiversity Area | -- | - | - | - | - |
| 13 | Others-Un used | 01.25 | -01.05 | 0.20 | Nil | |
| | Grand Total | 07.57 | | 07.57 | - | |

land use breakup details :

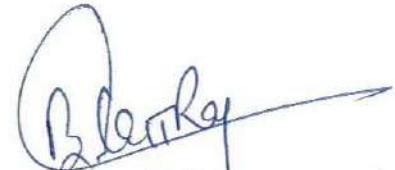
* Mining 3.74 Ha. (Existing pit 2.88 Ha., 0.02 Ha from existing waste dump, +0.84 Ha, fresh area)

**Waste Dump 1.42 Ha. (Existing waste dump 1.56 Ha., -0.02 Ha used for mining, -0.22 Ha used for Crushing/Screening/ Stock, -0.08 Ha used for infrastructure, +0.18 fresh area)

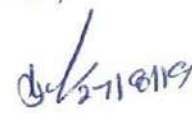
Crushing/Screening/ Stock yard 0.22 Ha (+0.22 Ha. over the existing waste dump - No dump rehandling is proposed as the area is flat and construction of screening/ crushing un it is proposed over the old dump)

\$ Infrastructure 0.11 Ha (+0.08 Ha. from existing waste dump, +0.03 fresh area)


SRIPAD PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

This Mining Plan is approved subject to the conditions / stipulations Indicated in the Mining Plan approval letter No. 279/784/2004/BN9
Date.....27-08-2019


क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines.
बंगलूर / Bangalore - 560 022



KIRLOSKAR FERROUS INDUSTRIES LIMITED
A Kirloskar Group Company



CONSENT LETTER/ UNDERTAKING/ CERTIFICATE:

01. The Mining Plan along with Progressive Mine Closure Plan of Kirloskar Channakeshava Mines [M/s M. Channakeshava Reddy (ML No.2566) mine lease block] over an extent of 7.57 ha in Lakkihalli & Kenkere villages, Hosadurga Taluka, Chitradurga District, Karnataka under Rule 16 of MCR 2016 has been prepared by Sripad Pujar and BVR Achar. This is to request the Regional Controller of Mines, Indian Bureau of Mines, Bengaluru, to make any further correspondence regarding any correction of the Mining Plan with the said qualified persons at the address below:

SRIPAD PUJAR **B.V.R. ACHAR**
M/s Rock Tech Enterprises, First Floor, Saphagiri Enclave,
College Road, HOSPET – 583 201, Ballari Dist. Karnataka.

We hereby undertake that all modifications / updating as made in the said Mining Plan by the said qualified persons be deemed to have been made with my knowledge and consent and shall be acceptable on me and binding in all respects.

02. It is certified that the **CCOM Circular No-2/2010** will be implemented and complied with.

03. It is certified that the **Progressive Mine Closure Plan** of Kirloskar Channakeshava Mines [M/s M. Channakeshava Reddy (ML No.2566) mine lease block] over an extent of 7.57 ha complies with all statutory rules, regulations, orders made by the Central or State Government, Statutory organization, Court etc which have been taken into consideration and wherever any specific permission is required the lessee will approach the concerned authorities.

The information furnished in the Progressive Mine Closure Plan is true and correct to the best of my knowledge and records.

Further, all the measures proposed in this closure plan will be implemented in a time bound manner as proposed

04. The provisions of **Mines Act, Rules and Regulations** made there under have been observed in the Mining Plan over an area of 7.57 ha, in Lakkihalli & Kenkere villages, Hosadurga Taluka, Chitradurga District, Karnataka, belonging to Kirloskar Ferrous Industries Ltd and where specific permissions are required, the applicant will approach the **D.G.M.S.** Further, standards prescribed by **D.G.M.S.** in respect of **miners' health** will be strictly implemented.

Date: 21.08.2019
Place: HOSPET.

for Kirloskar Ferrous Industries Ltd

Authorized Signatory

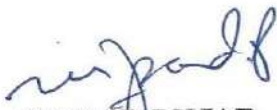





CERTIFICATE FROM QP

The provisions of the Mineral Conservation and Development Rules, 2017, have been observed in the preparation of Mining Plan along with Progressive Mine Closure Plan of Kirloskar Channakeshava Mines [M/s M. Channakeshava Reddy (ML No.2566) mine lease block] in Lakkihalli & Kenkere villages, Hosadurga Taluka, Chitradurga District over an extent of 7.57 ha and whenever specific permissions are required, the lessee will approach the concerned authorities of Indian Bureau of Mines.

The information furnished in the Mining Plan is true and correct to the best of our knowledge.


SRIPAD PUJAR
Qualified Person


B.V.R. ACHAR
Qualified Person

Place: Hosapete
Date: 21-08-2019

PHOTOGRAPHS



PHOTOGRAPHS-KFIL CKR



Pit with subgrade stock in the background



Some views of the mining area





Ore exposures



Mineral stocks

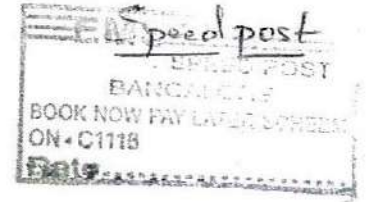




ANNEXURES



GOVERNMENT OF KARNATAKA



ANNEXURE - 1

No:DMG/MLS/AUC/'C' 2566/2018-19

6320-6326

Office of the Director
Department of Mines and Geology,
KhanijaBhavan, Race Course Road,
Bangalore-1, Date: 07.01.2019
Email id: dir-mines@karnataka.gov.in

To,
Kirloskar Ferrous Industries Limited,
Laxmanrao Kirloskar Road,
Khadki, Pune - 411 003.
Maharashtra.

7 JAN 2019

Sub: Letter of Intent with reference to e-auction dated **05.12.2018** for grant of iron ore mining lease for "**M/s Sri M Channakesava Reddy (M/s Sri Lakshmi Narasimha Mining Co) ML No: 2566**" Block in Kenkere/Lakky Halli village, Hosdurga Taluka, Chitradurga District over an extent of 7.57 Hectare.

1. Background:

1.1. The Director, Department of Mines and Geology, Karnataka, pursuant to the Supreme Court judgments and orders in Samaj Parivartana Samudaya and Ors. Vs. State of Karnataka and Ors in W.P.(C) 562 of 2009 (the "**Judgment**"), the Mines and Minerals (Development and Regulation) Act, 1957 and its amendments (the "**Act**") and the Mineral (Auction) Rules, 2015 including its amendments (the "**Rules**"), issued the notification and notice inviting tender dated 26 September 2018 for grant of mining lease for "**M/s Sri M Channakesava Reddy (M/s Sri Lakshmi Narasimha Mining Co) ML No: 2566**" located in Chitradurga District of Karnataka (the "**Tender Document**"). The e-auction process was conducted in accordance with the Mineral (Auction) Rules, 2015 (including its amendments) and the Tender Document for the said mineral block and **Kirloskar Ferrous Industries Limited** was declared as the "**Preferred Bidder**" in accordance with Rule 9 of the Mineral (Auction) Rules, 2015 including its amendments.

SRIPAD PUJAR

B.V.R. ACHAR
QUALIFIED PERSON QUALIFIED PERSON

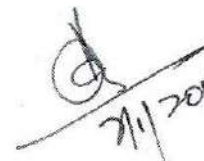
1.2. The upfront payment for "M/s Sri M Channakesava Reddy (M/s Sri Lakshmi Narasimha Mining Co) ML No: 2566" Block is Rs. 1,48,41,133/- (Rupees One Crore Forty Eight Lakhs Forty One Thousand One Hundred Thirty Three Only). As required under Rule 10 (1) of the Mineral (Auction) Rules, 2015, **Kirloskar Ferrous Industries Limited** has deposited the first instalment of the upfront payment, being ten percent of the upfront payment, of Rs. 14,84,113/- through Demand Draft (DD) bearing No. 026109 dated: 07.12.2018, which was received on 11.12.2018.

2. Grant of Letter of Intent

2.1. Accordingly, pursuant to Rule 10 (2) of the Mineral (Auction) Rules, 2015 including its amendments, the Government of Karnataka is issuing this letter of intent for grant of mining lease for " M/s Sri M Channakesava Reddy (M/s Sri Lakshmi Narasimha Mining Co) ML No: 2566" Block for iron ore in Kenkere/Lakky Halli village, Hosdurga Taluka, Chitradurga District over an extent of 7.57 Hectare to **Kirloskar Ferrous Industries Limited**.

3. Conditions


- 3.1. This letter of intent and the subsequent grant of aforementioned mining lease shall be subject to the provisions of the Judgment, Act and the rules made thereunder, as amended from time to time.
- 3.2. **Kirloskar Ferrous Industries Limited** shall be designated as the "Successful Bidder" and subsequently be granted the mining lease only upon satisfactory completion of all the requirements under the Judgment, Act, the rules made thereunder and the Tender Document.
- 3.3. For reference, the current requirements under the Rules and the Tender Document for declaration of **Kirloskar Ferrous Industries Limited** as the "Successful Bidder" and subsequent grant of the mining lease are reiterated below. It is clarified that the requirements mentioned below are only for reference and in the event of any change in Applicable Law, the requirements under the modified law, shall be applicable.


21/12/2018

(a) Declaration of the "Successful Bidder":

Hothur Ispat Pvt. Ltd shall be considered to be the "**Successful Bidder**" upon:

- i. continuing to be in compliance with all the terms and conditions of eligibility;
- ii. payment of the second instalment of the Upfront Payment which is **Rs 14,84,113/- (Rupees Fourteen Lakhs Eighty Four Thousand One Hundred Thirteen Only)**, as per the Tender Document;
- iii. furnishing the **Performance Security** pursuant to the Auction Rules, valid for the period specified in the Tender Document and Mine Development and Production Agreement (MDPA), for an amount equal to **Rs. 1,48,41,133/- (Rupees One Crore Forty Eight Lakhs Forty One Thousand One Hundred Thirty Three Only)**. Pursuant to sub-rule (1) of Rule 12 of the Auction Rules, the Performance Security shall be adjusted every five years so that it continues to correspond to 0.50% of the reassessed value of estimated resources including the value of any newly discovered mineral that may be included in the mining lease deed on its discovery determined in accordance with the Auction Rules. In such case, bank guarantee constituting the Performance Security shall be substituted with another bank guarantee of the same value issued in accordance with Clause 10.2 of the Tender Document, which is for the revised amount or if the Performance Security has been provided through a security deposit, additional amount towards security deposit shall be provided;
- iv. satisfying the conditions specified in clause (b) of sub-section (2) of section 5 of the Act with respect to a mining plan;
- v. having cleared all dues to the Government of Karnataka arising from mining activity that the Preferred Bidder has undertaken in Karnataka in the past, if such dues have been determined to be payable by him in terms of the extant provisions of the MMDR Act, 1957 and the rules framed there under, along with an undertaking that he shall also clear all dues that the Government of Karnataka determines in future, payable by him in terms of the extant provisions of the MMDR Act, 1957 and the rules framed there under, to the Government of Karnataka arising from mining activity undertaken by him in Karnataka in the past, if such dues have not been determined; and


7/1/2019

- vi. having paid the actual expenses incurred by the Government of Karnataka on mine exploration, preparation of Provisional R&R Plans, survey, construction of pillars and DGPS survey within **60** days of issue of letter of intent. This amount is equal to **Rs 2,28,66,113/- (Rupees Two Crore Twenty Eight Lakhs Sixty Six Thousand One Hundred and Thirteen Only)**.

The above activities shall be completed by the Preferred Bidder in accordance with the timelines mentioned in the Tender Document.

(b) Signing of the Mine Development and Production Agreement (MDPA)

Kirloskar Ferrous Industries Limited shall sign the Mine Development and Production Agreement with the Government of Karnataka upon obtaining all consents, approvals, permits, no-objections and the like as may be required under Applicable Laws for commencement of mining operations.

(c) Grant of mining lease

Subsequent to execution of the MDPA, **Kirloskar Ferrous Industries Limited** shall pay the **third instalment** of the Upfront Payment which is **Rs. 1,18,72,906/- (Rupees One Crore Eighteen Lakhs Seventy Two Thousand Nine Hundred and Six Only)**. Upon such payment, the Government of Karnataka shall grant the mining lease to **Kirloskar Ferrous Industries Limited** within a period of **30 days** from the date of payment. The date of the commencement of the period for which a mining lease is granted shall be the date on which a duly executed mining lease is registered.

4. Validity

- 4.1. This letter of intent is valid for a period of **30 months** from the date of its issuance, within which time all the above conditions must be fulfilled and the Mining Lease Deed must be executed between **Kirloskar Ferrous Industries Limited** and the Government of Karnataka. In case **Kirloskar Ferrous Industries Limited** is unable to fulfil all or any of the above conditions, then it may submit an application to Government of Karnataka, requesting for further extension. It is in the sole discretion of the Government of Karnataka to extend the validity of this letter of intent after **Kirloskar Ferrous Industries Limited** submits the reasons/justification for non-compliance with any of the conditions; which shall be due to events beyond the control of **Kirloskar Ferrous Industries Limited**.

A handwritten signature in black ink is written over the date 21/1/2019. The signature is a stylized cursive mark.

- 4.2. If the Government of Karnataka is satisfied that a longer period is required to enable **Kirloskar Ferrous Industries Limited** to satisfy all or any of the above conditions, it may extend the validity of this letter of intent for such period (upto maximum of two years) or periods as the Government of Karnataka may specify.
- 4.3. It is amply clarified that Kirloskar Ferrous Industries Limited is obligated to make Annual Payments as per the provisions of the Tender Document.

Kindly return the duplicate copy of this Letter of Intent duly signed by authorized signatory of the Company and furnish a suitable Board Resolution in token of having accepted the above terms and conditions. The accepted copy of Letter of Intent along with Board resolution should be submitted latest by 17.01.2019.

Sd/-
DIRECTOR
Department of Mines & Geology

Copy to:

1. The Secretary to Government (MSME and Mines), Commerce and Industries Department, Vikasa Soudha, Bangalore for kind information.
2. The Secretary, Department of Environment and Ecology M S Building Bangalore for kind information.
3. The Principal Chief Conservator of Forests, Aranya Bhavan, Malleshwaram, 18th cross, Bengaluru for information and further necessary action.
4. The Chairman, Monitoring Committee, Khanija Bhavan, 5th Floor, Bangalore- 01.
5. The Assistant Directorate General (EM), Environment Management Division, Indian Council of Forestry Research and Education, P.O. New Forest, Dehradun- 248006, Uttarakhand.
6. Regional Controller of Mines, Indian Bureau of Mines, 29, Industrial Suburb, II Stage, Tumkur Road, Gorguntapalya, Yeshwantpur, Bangalore-560 022 for information and further necessary action.


DIRECTOR
21/1/2019



GOVERNMENT OF KARNATAKA

No:DMG/MLS/AUC/'C' 2566/2018-19

Office of the Director
Department of Mines and Geology,
KhanijaBhavan, Race Course Road,
Bangalore-1, Date: 11.01.2019
Email id: dir-mines@karnataka.gov.in

To,
Kirloskar Ferrous Industries Limited,
Laxmanrao Kirloskar Road,
Khadki, Pune - 411 003,
Maharashtra.

Sub: Corrigendum to Letter of Intent with reference to e-auction dated 05.12.2018 for grant of iron ore mining lease for "M/s Sri M Channakesava Reddy (M/s Sri Lakshmi Narasimha Mining Co) ML No: 2566" Block in Kenkere/Lakky Halli village, Hosdurga Taluka, Chitradurga District over an extent of 7.57 Hectare.
Ref: This office even No. letter dated: 07.01.2019.

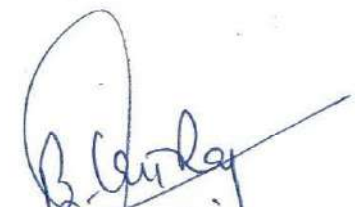
In the Letter of Intent (LoI) cited at reference, in para 3.3(a) **Kirloskar Ferrous Industries Limited** has been mentioned as **Hothur Ispat Pvt. Ltd** and it stands corrected as **Kirloskar Ferrous Industries Limited**. Other contents of Letter of Intent remain same.


 DIRECTOR

Department of Mines & Geology

11/1/2019


 SRI AD PUJAR
 QUALIFIED PERSON


 B.V.R. ACHAR
 QUALIFIED PERSON

File No.DMG-17012/2/2019-DMG_MLS-DMS

GOVERNMENT OF KARNATAKA

No. DMG/MLS/R&R/ML 2566/2019-20

Office of the Director
Department of Mines and Geology
Khanija Bhavan, Race Course Road
Bangalore-1, dated: 07.06.2019To,
The Chairman,
Monitoring Committee,
5th Floor, Khanija Bhavan,
Race Course Road, Bengaluru - 560 001.

Sir,

Sub:Implementation of Reclamation and Rehabilitation of auctioned 'C'
category ML No. 2566 - reg.

Ref:1. This office even No. letters dated: 17.05.2019.

2. CEC letter No. 2-61/CEC/SC/2017-Pt.III dated: 28.05.2019.

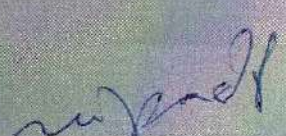
CEC vide letter cited under reference (2) accorded its concurrence to the Reclamation and Rehabilitation plan of the auctioned 'C' category mining lease earlier held by M/s Lakshminarasimha Mining Co, (M/s Channakeshava Reddy) Ore Mine (ML No. 2566). M/s. Kirloskar Ferrous Industries Ltd is Preferred Bidder for the above said block. The copy of the CEC letter cited at reference (2) and also the final R&R plan received from ICFRE approved by CEC are attached to this letter for your kind information & necessary action.

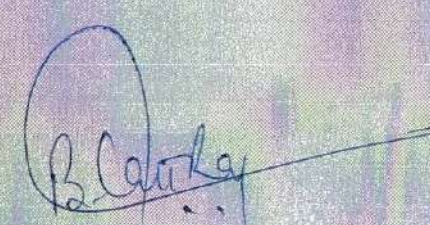
DRAFT APPROVED BY
THE DIRECTOR

Yours faithfully,


 DIRECTOR

DEPT. OF MINES & GEOLOGY

Copy to: M/s Kirloskar Ferrous Industries Limited, Laxmanrao Kirloskar Road,
Khadki, Pune - 411 003 Maharashtra for information.

 SRIPATH PUJAR
 QUALIFIED PERSON


 B.V.R. ACHAR
 QUALIFIED PERSON



CENTRAL EMPOWERED COMMITTEE
 CENTRAL BOARD OF MINING

F.No. 2-61/CEC/SC/2017-PLIII

Dated : 28th May 2019

To

The Chief Secretary
 Government of Karnataka
 Vidhan Soudha,
 Bengaluru- 560001

Sub : Preparation and implementation of the Reclamation and Rehabilitation Plan of the mining lease falling in District Bellary, Karnataka

Sir

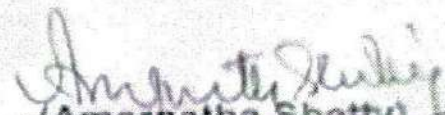
The CEC hereby gives its concurrence to the Reclamation and Rehabilitation Plan, of the following mining lease bid by M/s. Kirloskar Ferrous Industries Ltd. prepared by the ICFRE with the permissible annual production of iron ore as shown below :

| S.No. | Name of the Mining Lease | ML No. | Permissible annual production of Iron Ore Mine |
|-------|--|--------|--|
| 1. | Lakkihalli and Kenkere Iron Ore Mine of M/s. Kirloskar Ferrous Industries Ltd. | 2566 | 0.13 MMT (Based on reserve) |


It is requested that immediate action may please be taken for the implementation of the Reclamation and Rehabilitation Plan.

It may please be ensured that the mining activities are permitted to be undertaken only after compliance of the Hon'ble Supreme Court orders and in accordance with the stipulated conditions.

Yours faithfully


 (Amarnatha Shetty)
 Member Secretary


 SRIPAD PUJAR
 QUALIFIED PERSON


 B.V.R. ACHAR
 QUALIFIED PERSON

7 of 32



प्रारूप ० आई० आर०
Form I. R.

नियमन का प्रमाण-पत्र

CERTIFICATE OF INCORPORATION

ता०..... का सं०.....
No. 11-63223..... of 1991.....

मैं एतद्वारा प्रमाणित करता हूँ कि आज.....

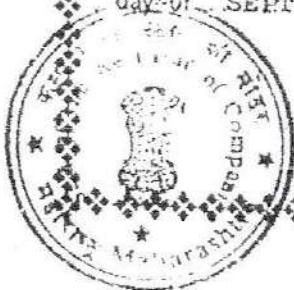
कम्पनी अधिनियम 1956 (1956 का 1) के अधीन नियमित की गई है और यह
कम्पनी परिसीमित है।

I hereby certify that **KIRLOSKAR FERROUS INDUSTRIES**
LIMITED.....

is this day incorporated under the Companies Act, 1956 (No. 1 of 1956)
and that the Company is limited.

मेरे हस्ताक्षर से आज ता०..... को दिया गया।
Given under my hand at **BOMBAY** this **TENTH**

day of **SEPTEMBER** One thousand nine hundred and **NINETYONE**



(B.L. PANIGAR)

कम्पनियों का रजिस्ट्रार

Addl. Registrar of Companies
Maharashtra

"Certified"

For Kirloskar Ferrous Industries Limited

M B Ektare

Authorised Signatory

SRIPAT PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON



KIRLOSKAR FERROUS INDUSTRIES LIMITED

A Kirloskar Group Company

Enriching Lives

Composition of the Board of Directors of Kirloskar Ferrous Industries Limited [As on 1 April 2019]

| | Name of Director and Designation | Director Identification Number (DIN) | Income Tax PAN | Date of Birth (DD/MM/YYYY) |
|----|---|--------------------------------------|----------------|----------------------------|
| 1 | Mr. Atul Kirloskar Chairman | 00007387 | ABIPK5776G | 13/02/1956 |
| 2 | Mr. Rahul Kirloskar Vice Chairman | 00007319 | ABIPK5774E | 07/07/1963 |
| 3 | Mr. R. V. Gumaste Managing Director | 00082829 | ADUPG8685L | 21/03/1958 |
| 4 | Mr. A. N. Alawani Non Independent Director | 00036153 | AAXPA8052D | 24/08/1945 |
| 5 | Mr. A. R. Jamenis Independent Director | 00082620 | AASPJ4276H | 02/05/1943 |
| 6 | Mr. B. S. Govind Independent Director | 06912189 | AAOPG1791J | 19/02/1946 |
| 7 | Mr. R. Sampathkumar Independent Director | 06894180 | AGAPR3547D | 06/10/1947 |
| 8 | Mrs. Nalini Venkatesh Independent Director | 06891397 | ABPPV0432K | 27/12/1949 |
| 9 | Mr. Y. S. Bhave Independent Director | 00057170 | AAHPB4223B | 16/07/1949 |
| 10 | Mr. Mahesh Chhabria Non Independent Director | 00166049 | ADCPM8911H | 19/04/1964 |

For Kirloskar Ferrous Industries Limited

C. S. Panicker
Executive Vice President (Corporate Finance) and
Company Secretary



SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON



Regd. Office : Laxminarao Kirloskar Road, Khadki, Pune - 411 003, Maharashtra (India)

Phone : +91 (20) 25810341, Telefax : +91 (20) 25813206, 25810209 Email : investor@kfil.com Website : www.kfil.com

CIN No. L27101PN1991PLC063223



Enriching Lives

KIRLOSKAR FERROUS INDUSTRIES LIMITED

A Kirloskar Group Company

COPY OF THE RESOLUTION PASSED BY THE BOARD OF DIRECTORS AT ITS MEETING HELD ON THURSDAY, 7 MARCH 2019

APPROVAL TO AUTHORISE THE MANAGING DIRECTOR TO DEAL WITH MATTERS RELATING TO MINES

"RESOLVED THAT, Sri. Ravindranath Venkatesh Gumaste, Managing Director of the Company, be and is hereby appointed :

1. As 'Owner', within the meaning of the section 2 (i) of Mines Act, 1952
2. As 'Owner', within the meaning of the section 3 (i) of Mines & Minerals (Regulation and Development) Amendment Act, 2015 and
3. As 'Owner', within the meaning of Rule 2(37) of the Explosive Rules, 2008; of all the Company's Iron ore, Manganese Ore, Quartz and any other Mines owned/to be owned/operated by the Company.

RESOLVED FURTHER THAT, Sri. Ravindranath Venkatesh Gumaste, Managing Director of the Company be and is hereby authorized to appoint Managers having prescribed qualifications in respect of every mine owned/to be owned/operated by the Company, to discharge the duties and responsibilities of Owner and shall be responsible for the overall management, control, supervision and direction of the mines.

RESOLVED FURTHER THAT, Sri. Ravindranath Venkatesh Gumaste, Managing Director of the Company be and is hereby authorized to sign all the documents / forms and returns as may be necessary/required for these purposes so as to comply with the provisions of the Mines Act, 1952, Explosive Rules 2008, MMRD Amendment Act, 2015 and other Labour and Industrial laws."

CERTIFIED TRUE COPY

FOR KIRLOSKAR FERROUS INDUSTRIES LIMITED



C. S. PANICKER
EXECUTIVE VICE PRESIDENT (CORPORATE FINANCE) AND
COMPANY SECRETARY

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON





ANNEXURE-5

ಭಾರತೀಯ ವಿಶಿಷ್ಟ ಗುರುತು ಪ್ರಾಧಿಕಾರ

ಭಾರತ ಸರ್ಕಾರ

Unique Identification Authority of India

Government of India

ನೋಂದಾವಣೆ ಶ್ರಮ ಸಂಖ್ಯೆ / Enrollment No.: 1189/03268/00774

To
 ಗುಮಾಸ್ತ ರವೀಂದ್ರನಾಥ ವೆಂಕಟೇಶ
 Gumaste Ravindranath Venkatesh
 S/O Venkatesh Jivaji Gumaste
 House No 27-34 I S R School Road
 Near Municipl Ground Annapurna Badavane,
 Chittlawadigi
 Hospet
 Hospet
 Hospet Bellary
 Karnataka 593201
 9448491632

12/01/2016
 328532035

 MA285320357FT



ನಿಮ್ಮ ಆಧಾರ್ ಸಂಖ್ಯೆ / Your Aadhaar No. :

3813 9113 5794

ಆಧಾರ್ - ಶ್ರೀಸಾಮಾನ್ಯನ ಅಧಿಕಾರ

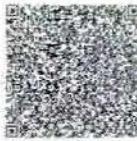


ಭಾರತ ಸರ್ಕಾರ

Government of India



ಗುಮಾಸ್ತ ರವೀಂದ್ರನಾಥ ವೆಂಕಟೇಶ
 Gumaste Ravindranath Venkatesh
 ಜನ್ಮ ದಿನಾಂಕ / DOB : 21/03/1958
 ಪುರುಷ / Male



3813 9113 5794

ಆಧಾರ್ - ಶ್ರೀಸಾಮಾನ್ಯನ ಅಧಿಕಾರ

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON



We, the Chancellor, Vice-Chancellor and Members of the Senate of the Gulbarga University

desire that

Shri Pujar Supad

having been examined for the Degree of Master of Science (General Education) and adjudged to have passed the examination (May 1988) in the First Class the Degree of

MASTER OF SCIENCE

(General Education)

has been conferred in pursuance of the Regulations on the Twelfth day of the month of March in the year One thousand nine hundred and eighty eight.

In Testimony whereof we set the seal of the said University and the signature of the Vice-Chancellor.

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿ,
ಕುಲಪತಿ ಹಾಗೂ ಸೆನೇಟ್ ಸದಸ್ಯರಾದ ನಾವು

ಶ್ರೀ ಪುಂಜಾರ ಶ್ರೀಪಾದ

ಅವರು ಮಾಸ್ಟರ್ ಆಫ್ ಸೈನ್ಸ್ (ಖಜಾಣೆ ಅಭ್ಯಾಸಕರಾಗಿದ್ದು) ಸದಮಿ ಪರೀಕ್ಷೆಯಲ್ಲಿ (ಮೇ ೧೯೮೮) ಪ್ರಥಮ ವರ್ಗದಲ್ಲಿ ಉತ್ತೀರ್ಣರಾದುದರಿಂದ ಅವರಿಗೆ

ಮಾಸ್ಟರ್ ಆಫ್ ಸೈನ್ಸ್

(ಖಜಾಣೆ ಅಭ್ಯಾಸಕರಾಗಿದ್ದು)

ಪದವಿಯನ್ನು ಗುಲಬರ್ಗಾದಲ್ಲಿ ಒಂದು ಸಾವಿರದ ಒಂಬತ್ತು ನೂರ ಎಂಟತ್ತಾರನೆಯ ಮಾರ್ಚ್ ನಾಲ್ಕರಂದು ನೀಡಿದ್ದೇವೆ.

ಈ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಮುದ್ರೆ ಮತ್ತು ಕುಲಪತಿಗಳ ಲಿಪಿಗಳಿಂದ ಇದನ್ನು ಪ್ರಮಾಣೀಕರಿಸಲಾಗಿದೆ.

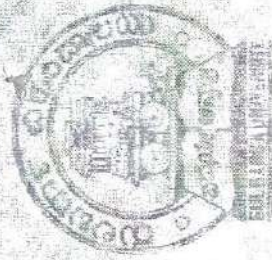
Sripad Pujar

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. Achar

B.V.R. ACHAR
QUALIFIED PERSON

ಕುಲಪತಿ Vice-Chancellor



Tungabhadra Minerals Ltd.,

ADMINISTRATIVE OFFICE

TARANAGAR-583119.
BELLARY DIST.,
KARNATAKA STATE

Telex: 0817-224 TMLIN
0845-8684
Grams: AGGREGATES, SANDUR,
3136
Phone: 3153 TORANAGALLU
3152

TMT/ 362 /93-94

28th June, 1993.

SERVICE CERTIFICATE

This is to certify that Mr. SRIPAD PUJAR has been working in our Organisation in the capacity of Junior Geologist since 3rd August, 1989. He is sincere and hard working. To the best of our knowledge his conduct and character are found to be good.

We wish him best of luck in his endeavours.

FOR TUNGA BHADRA MINERALS LTD.,

For: Administrative Officer

ASST. ADMINISTRATIVE OFFICER.

TELEX: 196-252 TPL IN

TEL. ADD.: TIMBLO MARGAO

TIMBLO PRIVATE LIMITED

PHONE: 21105 (16 LINES)

Registered Office
KADAR MANZIL
MARGAO - GOA
403 601

POST BOX NO. 34

19th July, 1989.

TO WHOMSOEVER IT MAY CONCERN

THIS IS TO CERTIFY that Shri P. Shripad was in our employment as a Trainee Geologist at our Head Office Margao Goa, from 3.2.1987 to 31.1.1989 and as a Jr. Geologist from 1.2.88 to 18.7.1989.

During the period of his service we have found him to be diligent, honest and hard working and his services were found to be satisfactory.

He left our service of his own accord for better prospects.

We wish him a bright future career.

This certificate is issued at his request.

TIMBLO PRIVATE LIMITED



(SATISH TIMBLO)
Director.

P. Shripad

Dr. ...
12/1/89
PRINCIPAL
S.E.S. Arts Science & Commerce College
SANDUR-583 118.



Vijayanagara Srikrishnadevaraya University, Ballari
Director, Post Graduate Centre, Nandihalli-sandur

Ph. No(Off) : 08395-278236
: 08395-278226

e mail:directorpgcn@gmail.com
web :www.vskub.ac.in

No:VSKUPGCN/ADM/2017-18/379

Date: 23.06.2017


To whomsoever it may concern

This is to certify that **Shri Sripad Pujar** has been awarded Master of Science (Mineral Exploration) during May 1985 from the PG Centre, Nandihalli under Gulbarga University, Karnataka, which is recognised under University Grants Commission.

Currently, this PG Centre, Nandihalli comes under the jurisdiction of Vijayanagara Srikrishnadevaraya University, Ballari, which is also recognised under University Grants Commission.

This is certified that the Master of Science (Mineral Exploration) is equivalent to Master of Science in Applied Geology.

Further, the Master of Science in Mineral Exploration started in the year 1976 was renamed as Master of Science in Applied Geology in 1993 with same curriculum.


DIRECTOR

Vijayanagara Srikrishnadevaraya Univ. Inver317
40 PG Centre, Nandihalli-Sandur

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ
Gulbarga University



ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿ, ಕುಲಪತಿ ಹಾಗೂ ಸೆನೆಟ್ ಸದಸ್ಯರಾದ ನಾವು

ಬಜಾರ್ ವಾಜಿರಾಜೇಂದ್ರಾಚಾರ್

ಅವರು ಮಾಸ್ಟರ್ ಆಫ್ ಸಯನ್ಸ್ (ಮಿನಿರಲ್ ಎಕ್ಸ್‌ಪ್ಲೋರೇಷನ್) ವರದಿ ಪೂರೈಯಲ್ಲಿ **ಮೇ ೧೯೮೮**
ಪ್ರಥಮ ವರ್ಗದಲ್ಲಿ ಉತ್ತೀರ್ಣರಾದುದರಿಂದ ಅವರಿಗೆ

ಮಾಸ್ಟರ್ ಆಫ್ ಸಯನ್ಸ್

(ಮಿನಿರಲ್ ಎಕ್ಸ್‌ಪ್ಲೋರೇಷನ್)

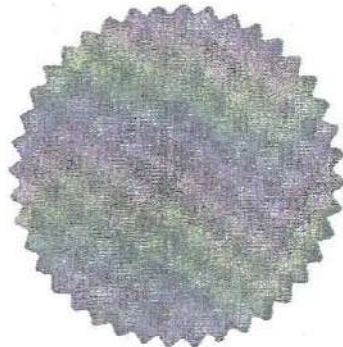
ವರದಿಯನ್ನು ಗುಲಬರ್ಗಾದಲ್ಲಿ ಓದು ಸಾರಿದ ಪಂಜತ್ತ ಸೇರವೆಂಬ ಶ್ರೇಣಿಯಲ್ಲಿ ಫೆಬ್ರುವರಿ ಇದ್ದು ಪ್ರಮಾಣೀಕರಿಸಲಾಗಿದೆ.
ಇದಕ್ಕಾಗಿ ಈ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಮುದ್ರೆ ಮತ್ತು ಕುಲಪತಿಗಳ ರುಜುಗಣದ ಇದನ್ನು ಪ್ರಮಾಣೀಕರಿಸಲಾಗಿದೆ.

We, the Chancellor, Vice-Chancellor and Members of the Senate of the Gulbarga University
Certify that **Bazar Vaji Rajendrachar**
having been examined for the Degree of Master of Science (Mineral Exploration)
and adjudged to have passed the examination **May 1988** in the
First Class the Degree of

MASTER OF SCIENCE
(Mineral Exploration)

has been conferred on him/her at Gulbarga on the **Twenty sixth** day of the month of
February in the year One thousand nine hundred and **Eighty nine**

In Testimony whereof are set the seal of the said University and the signature of the
Vice-Chancellor.



ಗುಲಬರ್ಗಾ
Gulbarga

ದಿನಾಂಕ: ೨೬-೨-೧೯೮೮
Dated: 26.2.1989

M. H. Chatterjee Raji

ಕುಲಪತಿ / Vice-Chancellor

Sripad Pujar

SRIPAD PUJAR

QUALIFIED PERSON

B. V. R. Achar

B. V. R. ACHAR

QUALIFIED PERSON



मिनरल एक्सप्लोरेशन कार्पोरेशन लिमिटेड
(भारत सरकार का उद्यम)
Mineral Exploration Corporation Limited
(A Government of India Enterprise)

पंजीकृत कार्यालय : डॉ. बाबासाहेब आंबेडकर भवन, हाईलैण्ड ड्राइव रोड, सेमिनरी हिल्स, नागपुर - ४४० ००६.
Regd. Office : Dr. Babasaheb Ambedkar Bhavan, Highland Drive Road, Seminary Hills, Nagpur-440 006.
Telephone : 510310, 510316, 510317, 510419, 510141, 510142, 510143, 510111
Fax : 091-0712-510133, 510548 E-mail : mecl @ nagpur.dot.net.in. website:www.meclindia.com

No: SMPA/Adm/Misc/2000/5469

Dated: 6-11-2001

SERVICE CERTIFICATE

This is to certify that Shri B.V.R.Achar joined this Organisation as Officer Trainee(Geology) on 28.5.1990 and he resigned from the services of this Corporation with effect from 30.9.2001. At the time of leaving the services he was holding the post of Senior Geologist in the scale of pay of Rs.4800-200-5800-225-8275/- with a basic pay of Rs.6025/- per month.



(R K PANIGRAHI)

SENIOR MANAGER (PERS. & ADMN.)-HOD

To

Shri B.V.R.Achar,
Ex-Sr. Geologist,
MECL, HARUR.

Through : The Project Manager, MECL, Harur Project.



Vijayanagara Srikrishnadevaraya University, Ballari
Director, Post Graduate Centre, Nandihalli-sandur

Ph. No(Off) : 08395-278236
: 08395-278226

e mail:directorpgcn@gmail.com
web :www.vskub.ac.in

No:VSKUPGCN/ADM/2017-18/378

Date: 23.06.2017

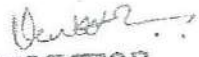
To whomsoever it may concern

This is to certify that **Shri Vajirajendrchar B.** has been awarded Master of Science (Mineral Exploration) during May 1988 from the PG Centre, Nandihalli under Gulbarga University, Karnataka, which is recognised under University Grants Commission.

Currently, this PG Centre, Nandihalli comes under the jurisdiction of Vijayanagara SriKrishnadevaraya University, Ballari, which is also recognised under University Grants Commission.

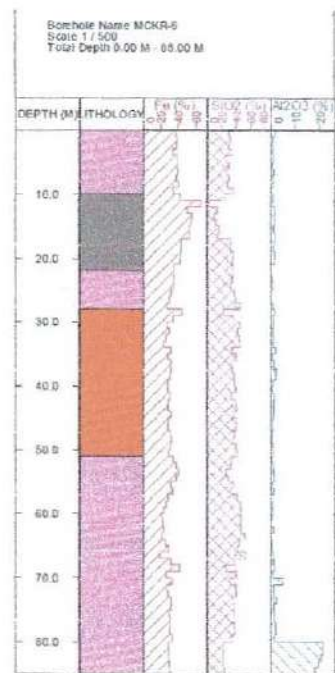
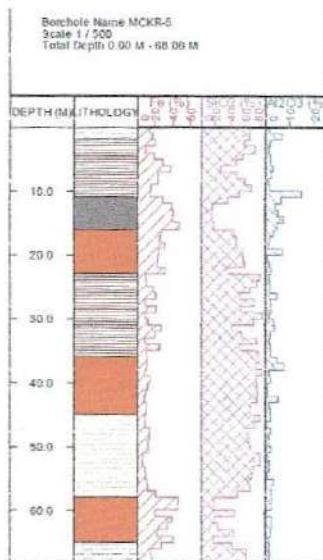
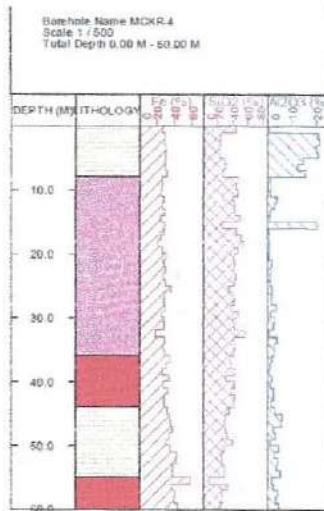
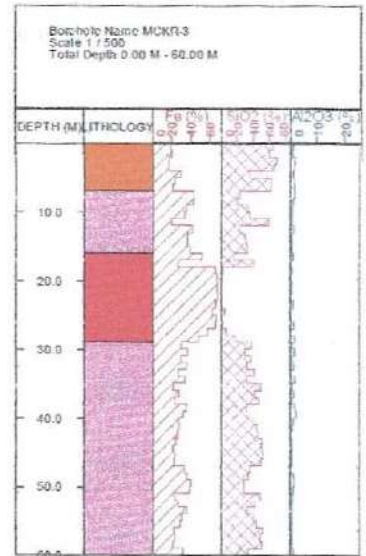
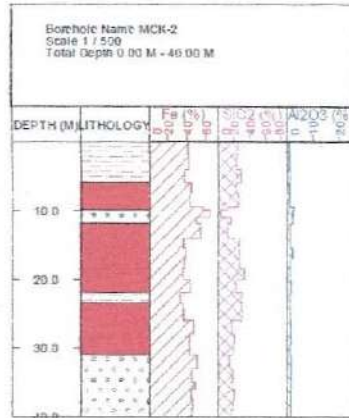
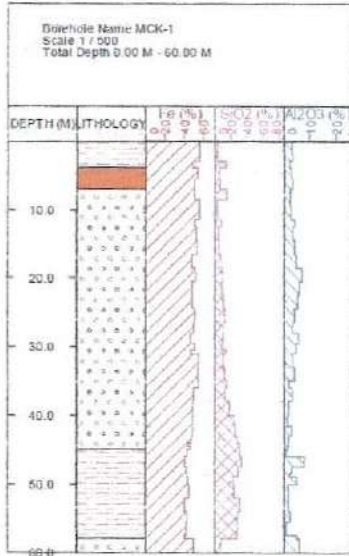
This is certified that the Master of Science (Mineral Exploration) is equivalent to **Master of Science in Applied Geology.**

Further, the Master of Science in Mineral Exploration started in the year 1976 was renamed as Master of Science in Applied Geology in 1993 with same curriculum.


DIRECTOR

Vijayanagara Srikrishnadevaraya University
PG. Centre, Nandihalli-Sandur

KFIL – MECL BOREHOLE LOGS



LEGEND

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Sripad Pujar
SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. Acharya
B.V.R. ACHAR
QUALIFIED PERSON

FEASIBILITY STUDY REPORT

1. General Mine description.

M/s M. Channakeshava Reddy (ML No.2566) mine lease block in Lakkihalli & Kenkere villages, Hosadurga Taluka, Chitradurga District over an extent of 7.57 ha area in Forest Land of Lakkihalli State Forest is a C category iron ore mining lease auctioned by GoK, and KFIL, is the 'Preferred Bidder' as per the Letter of Intent of Govt of Karnataka after e-auction.

2. Exploration- pitting/trenching/drilling.

M/s MECL has drilled 2 nos. of Core drill holes and 4 nos. of RC drill holes during Jan-Feb 2015. These bore holes are marked in Geological Plan and borehole logs are enclosed as Annexure-7.

3. Reserve assessment-sampling, chemical analysis, recovery with cut – off grade & tonnage factor method of assessment.

Estimation of reserves /resources in MECL report are based on its exploration. The quantum of mineralized zone has been estimated by geological cross section method at threshold cutoff of 45% Fe.

Summary of Mineral Reserves as given in MECL report

| Category | UNFC | | Reserves (Million Tonnes) | |
|------------------------|------|---------|---------------------------|-------------------|
| | MECL | Revised | Geological(1) | Net Geological(2) |
| Proved | G1 | 111 | 2.875 | 2.588 |
| Probable | G2 | 121/122 | 0.658 | 0.592 |
| Total in-situ reserves | | | 3.533 | 3.180 |
| Average grade | | | 51.73 Fe % | |

Table-4, Page No. 24 of MECL Report gives detailed calculation


SRI PAD PUJAR
 QUALIFIED PERSON


B.V.R. ACHAR
 QUALIFIED PERSON

However, resource/reserves were updated by cross sectional method considering the IBM threshold values (+45% Fe for Iron Ore) based on the level of exploration conducted by MECL. Geological cross sections are prepared at 50 to 100m interval. Sectional areas are calculated, and these areas are multiplied by sectional influence to arrive at the volume of the individual lithology. This volume is multiplied by bulk density to calculate tonnages.

Proved Mineral Reserves (111) are estimated based on G1 level of exploration data (drilling- 50mx100m grid). Proved ore is considered up to the depth of ore intersection in individual boreholes. Actual ore exposure in working pits is also considered as proved ore limit at individual sections. No depth wise influence is considered for estimation of proved mineral reserves.

Probable Mineral Reserves (122) are estimated based on G2 level of exploration data (drilling more than 100m and less than 200m grid).

Some portion of the ore is not minable as it is blocked outside the pit limit along the lease boundary in 7.5m safety zone. These are classified as Feasibility Mineral Resources (211). Ore present up to 20-30m below the proved reserves based on the structure of the ore body and of exposed but unexplored mineralized zone is classified as Inferred Mineral Resources (333).

Although MECL has considered Bulk Density as 3.5 tons/cum which is high, a Bulk density of 3.0 tons/cum is considered for iron ore, based on the experience in the sector.

BD for waste is 1.7 tons/cum. Field testing of Bulk Density will be carried out after the execution of the mining lease since it is an auctioned mining lease area. After getting test results intimation will be submitted to IBM and necessary modification- if required- will be done. A recovery of 95% has been considered. Remaining 5% material which is intercalated waste will be separated during crushing/screening and sent for waste dumping.

Resources and Reserves in tonnes (As on July 2019)

| Category | UNFC | Iron Ore | Avg Grade |
|-------------------------------------|---------|------------------|-----------|
| A. Total Mineral Reserves | | | |
| Proved Mineral Reserves | G1 -111 | 1,826,693 | 51.73% |
| Probable Mineral Reserves | G2- 122 | 772,208 | |
| <i>Subtotal</i> | | 2,598,901 | |
| B. Total Remaining Resources | | | |
| Feasibility Mineral Resource | G1-211 | 261,274 | - |
| Prefeasibility Mineral Resource | G2-221 | - | - |
| Measured Mineral Resource | G1- 331 | - | - |
| Indicated Mineral Resource | G2- 332 | - | - |
| Inferred Mineral Resource | G3- 333 | 753,170 | - |
| <i>Subtotal</i> | | 1,014,444 | - |
| Grand Total (A+B) | | 3,613,345 | |

4. **Production schedule-mine capacity, total handling/ROM ore & OB/waste handling, rate of production, dilution, recovery grade control /blending.**

Production capacity as per CEC approved production limit is 1.30 LTPA and same is proposed in this plan period.

Summary of production program

| Year | Iron Ore tonnes | Waste in tonnes | Ore to waste ratio |
|--------|-----------------|-----------------|--------------------|
| First | 129,960 | 8,466 | 1:0.09 |
| Second | 129,946 | 10,251 | 1:0.08 |
| Third | 129,960 | 35,335 | 1:0.27 |
| Fourth | 129,889 | 6,594 | 1:0.05 |
| Fifth | 129,832 | 36,623 | 1:0.28 |

5. **Mining method- bench dimensions,slope angle,stripping ratio & drilling, mining & transport equipment/Machinery.**

Mining is by Fully mechanized open cast mining method involving extraction of iron ore. Bench height and width will be 7m. The overall pit slope angle will be 45° max from the horizontal. Drilling and blasting techniques will be used to break the ore/waste formation. ROM will be fed to crushing and screening plants to produce saleable fractions. All waste material will be dumped systematically in the area earmarked.

Ore haulage will be by road through trucks of 16 tons capacity. Loading will be carried out systematically and care will be taken to prevent spillage and dust generation. All loaded trucks will be covered by tarpaulins to avoid generation of dust during haulage. Other activities like water supply for domestic use, water sprinkling and afforestation will be done by water tankers.

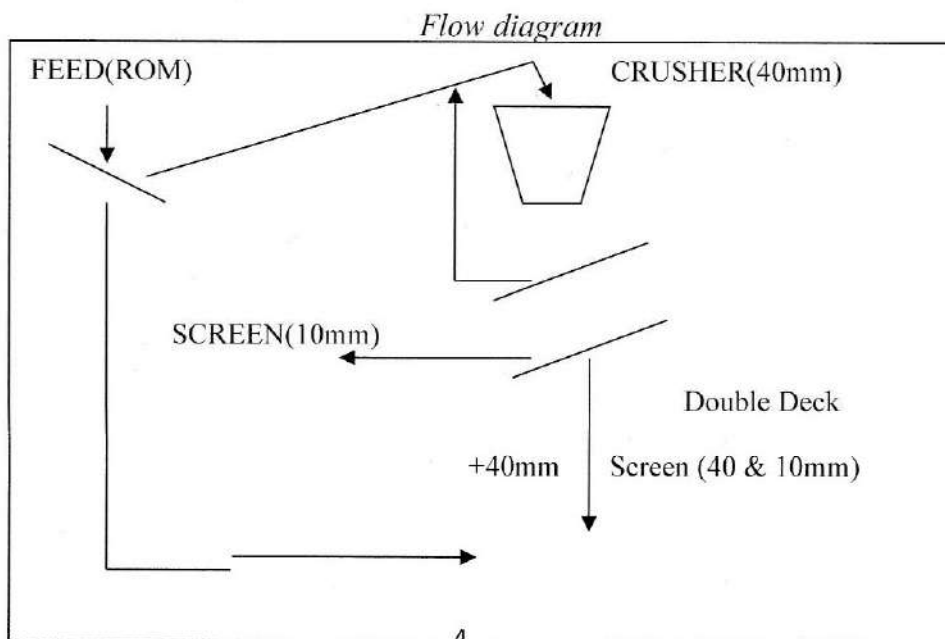
Machinery: The lessee will provide enough machinery. The list of them is given below.

| Type | Nos. | Size / Capacity |
|--------------------------|------|-----------------|
| Wagon drill / Compressor | 1 | 115mm |
| Excavator | 2 | 0.9cum |
| Wheel Loader | 1 | 1.0 cum |
| Tipper | 5 | 16 tons |
| Jeep | 1 | 5 Seat |
| Water Tanker | 2 | 8000 Ltrs. |
| DG Set | 1 | 33KVA |
| Crusher/Screening plant | 1 | 100 TPH |

6. Benefication-crushing/manual dressing, sorting, sizing & washing.

No wet mineral processing, only dry crushing and screening for size separation as per buyer's requirement. Crushing/Screening Plant will be of 100 tph. ROM will be fed to plant to bifurcate the same in to -10mm fines and +10 to -30/40mm calibrated ore.

In the plant, the ROM shall be separated first into -10mm and +10mm material by screening. +10mm will be crushed in the crusher, set to crush at 40mm. The crushed material will be screened on 40mm and 10mm screens as Calibrated Ore and Fines respectively. The lumps if required are crushed to -40mm size and screened.



Likely material balance

| Description | Rate |
|--------------------|---------|
| Feed (ROM) | 100 tph |
| Cal. Ore(-40+10mm) | 70 tph |
| Fines (-10mm) | 30 tph |

7. Marketing –type of commodity with use, prospective buyers, present sale price & forecasts.

Since this mine is a captive mine, entire production will be utilized in the KFIL Plant. All iron ore of +45% Fe will be used in the steel industry run by KFIL.

8. Infrastructure-road, power source, labour supply and skill:

All the required infrastructural facilities like office, resting area, canteen, water facilities etc will be set up inside lease area. The nearest railway station is at Hosadurga on Bengaluru-Harihar broad-gauge line of SWR at about 40km. It is about 350 km from Mangalore port and Hosadurga is about 21 km from mine gate which is having all facilities like Police Station, Hospital, Post Office, School, Workshops etc.

9. Category wise employment

| Sl. No | Description | Nos. | Sl. No | Description | Nos. |
|-------------------|-----------------|------|--------|-------------|------|
| 1 | Mine Manager | 1 | 6 | Mechanic | 1 |
| 2 | Mining Engineer | 1 | 7 | Supervisors | 4 |
| 3 | Geologist | 1 | 8 | Drivers | 5 |
| 4 | Foremen | 1 | 9 | Operators | 2 |
| 5 | Mining Mate | 1 | 10 | Helpers | 4 |
| Total - 21 | | | | | |

10. Environmental requirements-EIA&EMP, mine closure and reclamation plan, sustainable development strategy etc.

EIA studies and EMP including socio-economic impact, rehabilitation of project affected persons, waste disposal/reclamation detailed land use data were carried out by a reputed environmental consultancy firm and Environmental clearance is taken for this lease earlier. A progressive mine closure plan is enclosed in the Mining Plan.

11. Others like legal factors like tribal issues, national parks etc.

Not applicable

12. Economic evaluation-capital cost, production & transportation costs, royalty & other taxes, the availability of financing & profits to indicate that the mine is technically and economically viable under foreseeable operating scenario.

As the mine will be captive for KFIL Ltd and all ore production will be sent to the Steel Plant, hence economic viability issue will not arise.

However, the expected cost of production will be around Rs. 350 per ton. Apart from this, the company will pay a Royalty of 36.5% (as per auction) of IBM published sale price of the type of ore produced to DMG. (Currently IBM price for -55% Fe lumps is Rs. 1463/- and -55% Fe fines is Rs. 1079/-). Apart from above, DMF (30% of royalty), NMET (2% of royalty) and SPV (10% of royalty) will also be paid to DMG.



State Level Environment Impact Assessment Authority-Karnataka

(Constituted by MoEF, Government of India, under section 3(3) of E(P) Act, 1986)

No. SEIAA 03 Misc 2019

Date: 30-01-2019

TRANSFER OF ENVIRONMENTAL CLEARANCE

Preamble:

Attention is invited to the Environment Clearance Letter No.J-11015/24/2007-IA.II(M) dated 8th May 2007 of the Ministry of Environment and Forests, Government of India regarding grant of Environmental Clearance to M/s Sri M Channakesava Reddy (M/s. Sri Lakshmi Narasimha Mining Co) for undertaking mining of iron ore in Lakkihalli and Kenkere Iron ore mines in Chitradurga District.

The Department of Mines and Geology vide letter No.DMG/MLS/AUC/'C'-2566/2018-19 Dated: 7th January 2019 has issued letter of intent from "M/s Sri M Channakesava Reddy (M/s. Sri Lakshmi Narasimha Mining Co) ML No: 2566" Block for iron ore in Lakkihalli and Kenkere Iron ore mines in Chitradurga District of 7.57 Hectare Area to M/s Kirloskar Ferrous Industries Limited as preferred bidder.

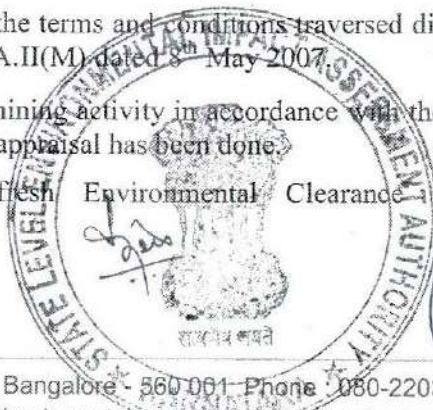
Request is made by M/s Kirloskar Ferrous Industries Limited vide letter Dated: 19th January 2019 who has been declared by the Department of Mines and Geology, Government of Karnataka vide letter dated 7th January 2019 as the "preferred bidder" for the "C category" of mine - M/s Sri M Channakesava Reddy (M/s. Sri Lakshmi Narasimha Mining Co) in an e-auction process to transfer the EC granted to M/s Sri M Channakesava Reddy (M/s. Sri Lakshmi Narasimha Mining Co) vide E.C. letter No.J-11015/24/2007-IA.II(M) dated 8th May 2007 in their favour has been considered by the SEIAA during the meeting held on 25th January 2019 in the light of the provision for "Transferability of Environmental Clearance (EC)" under para 11 of the Notification No. S.O. 1533(E) dated September 14, 2006 read with the Notification No. S.O. 4241 (E) dated December 30, 2016 issued by the Ministry of Environment Forests and Climate Change, Government of India. The Authority has decided to transfer the Environmental Clearance issued vide letter E.C. letter No.J-11015/24/2007-IA.II(M) dated 8th May 2007 in favour of M/s Kirloskar Ferrous Industries Limited, Laxmanrao Kirloskar Road, Khadki, Pune - 411003, Maharashtra subject to the following conditions in addition to the terms and conditions under which the prior Environmental Clearance has been granted and for the same validity period.

The transferee shall abide by all commitments made by the earlier proponent and honor them in the letter and spirit.

The transferee shall comply all the terms and conditions traversed directly or indirectly in the EC letter No. J-11015/24/2007-IA.II(M) dated 8th May 2007.

The transferee shall undertake mining activity in accordance with the approved mining plan based on which the environmental appraisal has been done.

The transferee shall seek fresh Environmental Clearance if there is any change/modification in the mining plan.



The transferee shall comply all orders, guidelines and additional conditions imposed by the Hon'ble Supreme Court, CEC and others with regard to environment safety, R&R Plan, etc

Hence the order.

ORDER

Pursuant to the facts and circumstances traversed in the preamble, the Environmental Clearance issued in favour of M/s. M Channakeshava Reddy, Krishna Gardenia No. 559, flat No. 3, RMV II stage, New BEL road, Next to Scientific Nursery, Sanjaynagar Post, Bangalore - 560 094 by the Ministry of Environment and Forests, Government of India vide letter No. E.C. letter No. J-11015/24/2007-IA.II(M) dated 8th May 2007 in Lakkihalli and Kenkere Iron ore mines in Chitradurga District stands transferred to M/s Kirloskar Ferrous Industries Limited, Laxmanrao Kirloskar Road, Khadki, Pune - 411003, Maharashtra subject to the following conditions in addition to the terms and conditions under which the prior Environmental Clearance has been granted and for the same validity period.

1. The transferee shall abide by all commitments made by the earlier proponent and honor them in the letter and spirit.
2. The transferee shall comply all the terms and conditions traversed directly or indirectly in the E.C. letter No. J-11015/24/2007-IA.II(M) dated 8th May 2007.
3. The transferee shall undertake mining activity in accordance with the approved mining plan based on which the environmental appraisal has been done.
4. The transferee shall seek fresh Environmental Clearance if there is any change/modification in the mining plan.
5. The transferee shall comply all orders, guidelines and additional conditions imposed by the Hon'ble Supreme Court, CEC and others with regard to environment safety, R&R Plan, etc.



[Signature]
30/1/19
L. Shanthakumar
Member Secretary,
SEIAA

To,

M/s Kirloskar Ferrous Industries Limited,
Laxmanrao Kirloskar Road,
Khadki, Pune - 411003,
Maharashtra.

Copy to:

- (1) The Secretary, Ministry of Environment, Forests and Climate Change, Indira Paryavaran Bhavan, Jor Bagh Road, Aliganj, New Delhi- 110003.
- (2) The Commissioner, Bruhat Bengaluru Mahanagara Palike (BBMP), N.R.Square, Bengaluru- 560002.
- (3) The Member Secretary, Karnataka State Pollution Control Board, Bengaluru.

- (4) The APCCF, Regional Office, Ministry of Environment & Forests (SZ), Kendriya Sadan, IV Floor, E & F wings, 17th Main Road, Koramangala II Block, Bangalore-560 034.
- (5) M/s. M Channakeshava Reddy, Krishna Gardenia No. 559, flat No. 3, RMV II stage, New BEL road, Next to Scientific Nursery, Sanjaynagar Post, Bangalore – 560 094
- (6) Guard File.

387

No.4-KRC277/2007-BANI/778
Dated the 13th September, 2007

To

The Principal Secretary to the Govt. of Karnataka,
Forests, Environment & Ecology Department,
M.S. Building, Dr. Ambedkar Veedhi,
Bangalore - 560 001.

Subject: Diversion of 7.85 ha. of forest land for renewal of ML No.329(A) in favour of Shri M. Channakeshava Reddy for mining of iron ore in Lakkihalli SF, Hosadurga taluk, Chitradurga District.

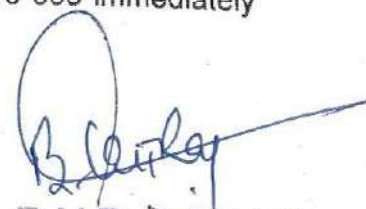
Sir,

Kindly refer to the State Government's letter No.FEE 204 FFM 2006 dated 04.01.2007 seeking prior approval of the Central Government in accordance with Section '2' of Forest (Conservation) Act, 1980 for the above project. The in-principle approval (Stage-I) to the project was accorded by the Central Government vide letter of even number dated 08.08.2007. The State Government vide letter No.FEE 204 FFM 2006 dated 12.09.2007 have reported compliance to the conditions stipulated by the Central Government in the in-principle approval.

After careful consideration of the proposal of the State Government, I am directed to convey Central Government's approval (Stage-II) for diversion of 7.85 ha. of forest land for renewal of ML No.329(A) for extraction of iron ore in Lakkihally SF of Lakkihally and Kenkere village, Hosadurga taluk, Chitradurga District in favour of Shri M. Channakeshava Reddy, for a period of 20 years co-terminus with the lease granted under MMDR Act, 1957, subject to the following conditions:-

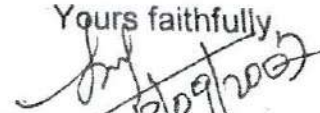
1. The legal status of forest land shall remain unchanged.
2. The demarcation of the proposed forest area shall be carried out by erecting cement concrete pillars duly numbered at an interval of 20 meters at the cost of user agency.
3. The State Government shall raise and maintain a safety zone and will also raise and maintain the plantation over an area, one and half times of the extent of the safety zone, of the degraded forest land, at the project cost.
4. No new construction of building for any purpose will be taken up in the forest area diverted for the project.
5. The funds received from the user agency towards NPV under this project shall be transferred to Ad-hoc CAMPA in account number CA-1582 of Corporation Bank, Block-II, CGO Complex, Phase-I, Lodhi Road, New Delhi -110 003 immediately under intimation to this office.


SRIPATH PUJAR
QUALIFIED PERSON


B.V.R. ACHAR
QUALIFIED PERSON

6. The mining activity in the forest area shall be carried out as per the approved mining plan from the IBM.
7. The user agency shall obtain Environmental Clearance under the Environment (Protection) Act, 1986.
8. The consent of State Pollution Control Board shall be obtained under Air & Water Act before the commencement of mining operation and it shall be renewed every year.
9. Trees shall be felled only when it becomes necessary and under the supervision of the State Forest Department.
10. No labour camps shall be established on the leased/diverted forest land.
11. Sufficient firewood shall be provided by the user agency to the labourers at the project cost after purchase from the State Forest Department/Forest Development Corporation.
12. Reclamation plan shall be executed by the user agency from the very first year of mining and an annual report shall be sent to the Nodal Officer and the Regional Office, Bangalore.
13. The user agency shall protect the top soil at the project cost.
14. The user agency shall ensure that there should be no damage to the wildlife.
15. The forest land shall not be used for any purpose other than that specified in the proposal.
16. The total forest area utilized for the project shall not exceed 7.85 ha. In case the land is not used for the stipulated purpose, then the area will be resumed by the Forest Department.

Yours faithfully


(Sobhana K.S. Rao)

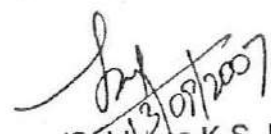
Deputy Conservator of Forests (Central)

Copy to:-

1. The Director General of Forests & Special Secretary to Govt. of India, Ministry of Environment & Forests, Paryavaran Bhavan, CGO Complex, Lodhi Road, New Delhi - 110 003.

389

2. The Principal Chief Conservator of Forests, Forests Department, Govt. of Karnataka, Aranya Bhavan, 18th Cross, Malleswaram, Bangalore – 560 003.
3. The Chief Conservator of Forests/Nodal Officer, Office of the Principal Chief Conservator of Forests, Forests Department, Govt. of Karnataka, Aranya Bhavan, 18th Cross, Malleswaram, Bangalore – 560 003.
4. Shri M. Channakeshava Reddy. C/o M. Dasaratha Rami Reddy, Mine Owner, 2/43, Pujari Layout, RMV 2nd Stage, 2nd Floor, Sanjay Nagar Post, Bangalore – 560 094.
5. Guard file.



(Sobhana K.S. Rao)
Deputy Conservator of Forests (Central)


9/2

PART - IV A
REPORTING OF MINERAL RESOURCES

| Sl.no | Contents | Explanation |
|-------|--------------------------------|---|
| 1 | Title & Ownership | M/s CHENNAKESAVA REDDY MINE LEASE AREA (ML No.2566) ,DISTRICT: CHITRADURGA, KARNATAKA,GOVT.OF KARNATAKA Period of prospecting : January 2015 – February 2015 and analysis in the month of May 2015 |
| 2 | Details of the area | Longitudes E76°24'44.21" and 76°24'43.13" and Latitudes N13°55'26.83" and 13°55'27.66". The area is covered in Survey of India Toposheet No.57 C/5. Lease area is 7.57 Hectares |
| 3 | Infrastructure and environment | The mine lease area is 20 km from Hiriyuru town. The nearest railway station Hosadurga at a distance of 39 kms. |
| 4 | Previous Exploration | Nil; while the mine area has been exploited for iron ore |
| 5 | Geology | <p>The Chitradurga basin is an elongated narrow belt of 450 kms in length. It narrows southwards and splits up into several linear strips south of Dodguni. The basin is structurally disturbed, followed by later folding and shearing movements and covers an area of about 5550 sq,km. It trends NNW-SSE with an easterly moderate dip.</p> <p>Shelf facies is subordinate confined to a narrow strip along the western margin. In the main, the basin shows characteristics of sedimentation in deep water. The mafic complex to the south of Chitradurga town represents one of the thickest accumulations of pillowed tholeiitic basalt associated with pyro clastics. Basement gneiss of smaller dimensions is present. The eastern margin is a thrust contact with mylonite zone. An intrusive granite [2500 Million years] sets the upper limit to the sedimentation.</p> <p>The change of oxide – carbonate facies with chert and manganese ore [gradually subsiding basin] to sulphide facies with carbonaceous shale, chert layers with dominant pyrite is observed in the deeper parts of the Chitradurga basin. Thus, traced along the strike the iron formation appears differently, having formed under different environments of deposition.</p> <p>Metamorphism of Chitradurga basin is of Green schist facies, at places it graduates into amphibolite facies, though garnet do occur.</p> |



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| Sl.no | Contents | Explanation |
|-------|--|---|
| | | Average strike Length of the iron ore zone - 340.00m Average wide - 220 – 240 m Average thickness - 9.- 12m |
| 6 | Aerial/Ground Geophysical /Geochemical data | -- |
| 7 | Technological Investigation | Exploratory drilling at 100m x 100m grid pattern (G1 level of UNFC) |
| 8 | Location of data points | Provided in the topographical and geological map on 1:1000 scale |
| 9 | Sampling techniques | <p>The core recovered by drilling was divided into two longitudinal halves. One half was taken for sampling, whereas the second half was kept for future reference [with DGM, Karnataka]. The first half was subjected to uniform size reduction of 1mm size. It is thoroughly mixed pounded and powdered to (-) 100 mesh size by pestle and mortar and then coned and quartered. 3 sample packets of 100 gram each have been prepared; out of the three, one packet was handed over to DGM, Karnataka and the other one has been labeled and sent to MECL laboratory for Fe, SiO₂ and Al₂O₃ analyses, whereas the third packet has preserved for future reference.</p> <p>The entire lot of chips and powder material were collected from boreholes drilled by Reverse Circulation drill. 50% mostly of chip samples have been thoroughly mixed to have the desired quantity of 500-600 gms. and pounded to (-)100 mesh size by progressive reduction, 3 sample packets of 200 gram each has been prepared; out of the three, one has been labeled and sent to MECL lab. for Fe, SiO₂ and Al₂O₃ analyses and the other packet was handed over to DGM, Karnataka, and the 3rd packet of the sample has been preserved for further studies at camp.</p> |
| 10 | Drilling Technique and drill sampling employed | Exploratory core drilling - 100.00m (2 BHs) RC Drilling - 273.00m (4 BHs) Total Drilling - 373.00m (6 BHS) |
| 11 | Sub sampling techniques and sample preparation | As explained above at Sl.no.9 |
| 12 | Quality of assay data and laboratory tests | Assayed at MECL Lab. by classical method; by JNRDC, Nagpur by XRF method |
| 13 | Moisture | |
| 14 | Bulk Density | Nil; however, specific gravity determined on 6 no. of samples |

| Sl.no | Contents | Explanation |
|-------|-----------------------------------|---|
| 15 | Resource estimation techniques | <p>Resources have been estimated by geological cross section method. In order to delineate the ore and non-ore, the grade or threshold value of 45% Fe has been adopted, thus non ore above and below ore zones has been demarcated. The rule of gradual change or law of linear function has been applied [Constantine C. Popoff, 1965] along with the rule of nearest points for application of influence of half way between successive boreholes.</p> <p>At threshold cutoff of 45% Fe as stipulated by IBM, the mineralized zone within the lease hold area and the ore reserves are estimated.</p> <p>Ore reserves estimated is 3.179 million tonnes with 51.73% Fe, 13.12% SiO₂ and 2.72% Al₂O₃</p> <p>Raw assay data and zone data have been subjected for statistical studies to derive various parameters including sichel's 't' estimator</p> |
| 16 | Further work | - |
| 17 | Annexure/enclosures to the report | MECL reports includes all the relevant maps, sections, logs, analytical reports & fields photos |
| 18 | Any other information | It could further yield Manganese ore also |

(Signature)

B. L. MALLIKARJUN
HOD (Business Dev. & Planning)
Mineral Exploration Corporation Ltd.

Mahazar

The joint survey of boundary demarcation work of ML. No. 2566 of Sri. M.CHENNAKESHA REDDY (M/s SRI. LAKSHMI NARASIMHA MINING CO. Pvt. Ltd.) ^{SED} granted over an extent of 7.57 Hectares in Sy.No. 64 of KENKERE & 109 of LAKKIHALLI village, HOSDURGA Taluk, CHITRADURGA District has been carried out by NITK Suratkal team in presence of representatives of Lessee and the officials of Mines and Geology, Forest Dept., on 17.08.2012.

The joint survey and demarcation work of said lease has been carried out as per the Hon'ble Supreme Court approved sketch.

The detail of survey and demarcation in as follows :-

Assumed Co-ordinates

| Sl. No | Reference/ ML corner Points | Total Station Readings | | | GPS Co-ordinates - WGS-84 By using handheld GPS | | Remarks |
|--------|-----------------------------|------------------------|----------|---|--|------------|---------|
| | | X | Y | Z | Latitude | Longitude | |
| 1 | LBS-A | 840.793 | 1338.293 | | 13 55 32.2 | 76 24 42.3 | |
| 2 | LBS-B | 808.344 | 993.364 | | 13 55 21.1 | 76 24 41.1 | |
| 3 | LBS-C | 983.410 | 971.032 | | 13 55 20.1 | 76 24 46.9 | |
| 4 | LBS-D | 1104.174 | 1068.198 | | 13 55 23.3 | 76 24 51.0 | |
| 5 | LBS-E | 1074.213 | 1168.847 | | 13 55 26.6 | 76 24 50.0 | |
| 6 | LBS-F | 959.710 | 1310.321 | | 13 55 31.3 | 76 24 46.5 | |

Jinal
J.R.D.M.G.

S. Sreenivasulu Reddy
Forest Surveyor
Forest Department

For Sri Lakshmi Narasimha Mining Company Pvt. Ltd.,
Authorized Signatory

Ravi (Rajesh)
CFR Hyderabad
HOD Mining Dept.
N.I.T.K.

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