MINING PLAN

Submitted for approval under Rule 16 of MCR 2016
including ***PMCP*** *submitted under Rule 23 of Mineral Conservation and Development Rules 2017*

for

Kirloskar Bharath Mines

[M/s Bharat Mines & Minerals (ML No.2245) mine lease block]
in Nandihalli village, Sandur Taluka, Bellary District

of

Enriching Lives

KIRLOSKAR FERROUS INDUSTRIES LIMITED

Rule 45 reg. no: IBM/161/2011

Area: 24.47 Ha
in Kumaraswamy Reserve Forest

Lease period: 50 years as per MMDR Amendment Act 2015

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

Prepared by

SRIPAD PUJAR
M.Sc. Mineral Exploration
Qualified Person

B.V.R. ACHAR
M.Sc. Mineral Exploration
Qualified Person

May-2019

C O N T E N T S

ANNEXURES

Nos.	DESCRIPTION
1.	Copy of LOI by DMG, GoK for Mining Lease
1a	Copy of letter regarding 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.	Copy of DMG letter regarding DGPS co-ordinates
8.	Copy of MECL report (reserves) extract
9.	Year wise Production & Development Program
10.	Copy of Environmental Clearance
11.	Copy of Forest Clearance
12.	Feasibility Study Report

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 : 2000
II b	Geological Plan	1 : 2000
II c	Geological Cross Sections	1 : 2000
II d	Graphical Lithologs	1 : 500
III a to e	Production development plans	1 : 2000
III f	Production development sections	1 : 2000
IV	Reclamation plan	1 : 4000
V	Environment Plan	1 : 2000
VI a	Conceptual Plan	1 : 2000
VI b	Dump Management Plan	1 : 2000
VII	Financial Area Assurance Plan	1 : 2000

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 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 Kumarswamy range (Devadarigudda) 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. 2245, previously held by M/s Bharat Mines & Minerals Limited has a total encroachment area of 18.23 Ha [under mining pit (8.05 Ha), OB dumps (8.98 Ha) and others category (1.20)]. 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. ..279/1099/2019/BNG
Date..24/5/2019

24/5/19
क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines,
बेंगलूर / Bangalore - 560 022

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 (LoI) vide letter no. DMG/MLS/AUC/'C'-2245/2018-19 dated 06.10.2018 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 24.47 ha with a production program of 0.124 MTPA (Annexure-1a) as per the R&R report of ICFRE / CEC. 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

Apart from the above, KFIL also has secured another LoI from the Dept of Mines & Geology (DMG) for another ML block [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] vide letter no. DMG/MLS/AUC/'C'-2566/2018-19 dated 07.01.2019.

1.0 GENERAL

a)

Table -2:

Name of lessee	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	020-25810341
Fax	020-25813208 / 25810209
Mobile	09448491632
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 Annapurna Badavane, 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 Bharath Mines
Lat/long of any boundary point	LBS -A Latitude - 15° 01' 43.84657" Longitude - 76° 35' 25.62412" There are 17 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	06.10.2018 (LoI grant date)
Period/Expiry Date	50 yrs as per MMDR (Amendment) Act-2015
Postal Address	Kirloskar Bharath Mines, Near Nandihalli, Sandur taluk
District	Bellary
State	Karnataka
Pin code	583119
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 :

Forest	Non-forest	
Kumaraswami Range Reserve Forest Area-24.47 ha	(i) Waste land (ii) Grazing land (iii) Agriculture land (iv) Others (specify)	NIL

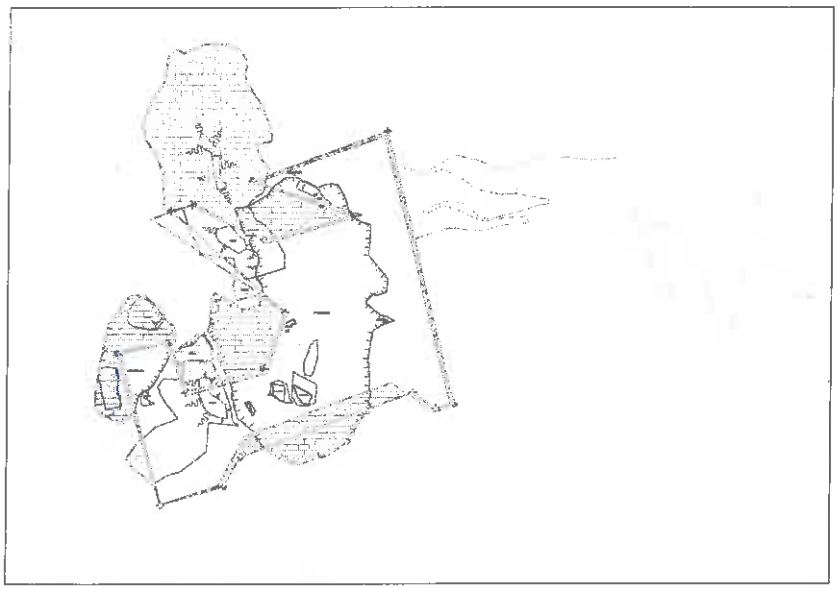
Table -6:

Total lease area	24.47 ha
District & State	Ballari Dist, Karnataka State
Taluka	Sandur
Village	Nandihalli
Whether the area falls under Coastal Regulation Zone (CRZ)?	No
Existence of public road/railway line, if any nearby and approximate distance	One public road is passing NE of the lease at around 4 km. Ranjitpur is the nearest railway station which is at a distance of 5km towards NE.
Toposheet No. with latitude & longitude of all corner boundary point/pillar	Topo sheet no –D46 E 12 (57 A/12) Lat / Long values are given in table below

Table – 7: Latitude and longitudes of corner pillars as per DGPS

SL. NO.	PILLAR ID	LATITUDE	LONGITUDE
		dd - mm - ss	dd - mm - ss
1	BLR-09	N15°01'46.93700"	E76°34'38.49700"
2	LBS-A	N15°01'43.84657"	E76°35'25.62412"
3	LBS-B	N15°01'54.22593"	E76°35'21.37669"
4	LBS-C	N15°01'55.32583"	E76°35'24.80892"
5	LBS-D	N15°01'51.75250"	E76°35'26.60598"
6	LBS-E	N15°01'53.95940"	E76°35'32.05997"
7	LBS-F	N15°01'58.34472"	E76°35'32.97602"
8	LBS-G	N15°02'03.69878"	E76°35'22.30861"
9	LBS-H	N15°02'05.14264"	E76°35'25.34458"
10	LBS-I	N15°02'03.03593"	E76°35'30.97060"
11	LBS-J	N15°02'05.72812"	E76°35'37.45262"
12	LBS-K	N15°02'07.18386"	E76°35'29.51739"
13	LBS-L	N15°02'11.39010"	E76°35'38.33528"
14	LBS-M	N15°01'53.16930"	E76°35'45.54410"
15	LBS-N	N15°01'52.64912"	E76°35'44.32019"
16	LBS-O	N15°01'54.28842"	E76°35'41.05733"
17	LBS-P	N15°01'49.33657"	E76°35'31.05125"
18	LBS-Q	N15°01'45.68789"	E76°35'29.67496"

c) Attach a general location map showing area and access routes. It is preferred hat 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.

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

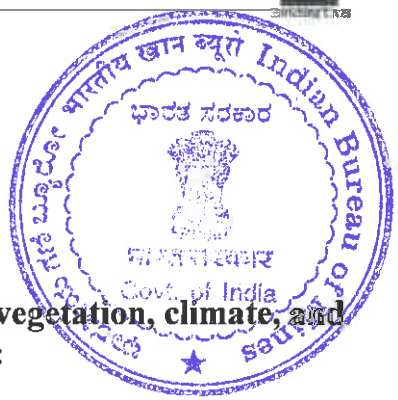
Not applicable as this is first Mining Plan after lease grant proposal to KFIL.

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 lease area in Devadari range, trending almost NW-SE covers hills and plateaus and at some places is covered with laterite and a thick mantle of soil. The area comprises of NW-SE trending ridges with an altitude of around 1000m above MSL. The area has its highest elevation at about 1000m and lowest at about 760m above MSL. The area covers a major plateau area with some escarpments and hill slopes. The valleys host a drainage pattern trending towards northeast and join the small nallahs and streams.

The area enjoys tropical climate with an annual average rainfall of about 750mm. 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%.

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

The lease area is in donimalai block of Sandur schist belt forming part of the Bellary- Hospet group of iron/manganese ore deposits. This schist belt is the smallest of the three basins and covers an area of just 960sqkm. It is structurally highly disturbed and squeezed out of shape by the intrusion of younger granites. Shelf facies as in the other basins is confined to the western margin. Well-developed mafic magmatism and strong development of Manganiferous greywacke, phyllite and numerous bands of banded hematite quartzites (BHQ) characterize the basin. The basin is known for its rich accumulation of both Iron and Manganese Ore. Basement cover relations are obscured because of intense deformation and intrusion by younger granite.

This lens-shaped schist belt is about 60km long, with a maximum width of 28km in the central part. Four formations have been distinguished in this basin (Yashwantnagar, Deogiri, Donimalai and Nandihalli). The Yashwantnagar Formation is largely composed of volcanic flows; the Deogiri formation by manganiferous greywacke argillite and the Donimalai Formation by extensive development of banded haematite and chert & Jasper. The topmost Nandihalli Formation is made up of metabasalts with intercalation of greywacke and argillites. Lateritization has played an important role in the concentration of manganese and Iron in the profile, resulting in rich accumulation of manganese/Iron ore for which this schist belt is well known.

Table-8: The stratigraphic succession of Sandur Schist belt

Nandihalli formation	Metabasalt, metagabbro, acid volcanics and intercalated bands of greywacke-argillite etc.)
Donimalai formation	Banded ferruginous or pyritiferous chert (with its various metamorphic equivalents), metabasalt/amphibolite, metagabbro, andesitic tuff, acid volcanics, conglomerate, meta greywacke and metapelites, (garnet-mica schist, andalusite schist, cordierite-garnet gneiss etc)
Deogiri formation	a. Manganiferous greywacke-argillite, with some bands of banded ferruginous chert and thin dolomitic limestone. b. Metabasalt and rare acid tuff c. Arenites, dolomitic limestone and phyllite.
Yashwantnagara formation	Metabasalt/amphibolite. with meta pyroxenite, metagabbro and thin intercalated bands of quartzite and quartz-mica schist.
Peninsular gneiss: (banded granodiorite/tonalite gneiss)	

(Source: Stratigraphy and Structure of the Sandur Schist Belt, Karnataka, Abinaba Roy and SK Biswas in Journal of Geological Society of India, Vol. 24. Jan. 1983)

The manganese ore deposits are mainly concentrated along the western part of the Sandur schist belt and restricted to Lower Deogiri formations. The important deposits are found in the Kammatur, Yashwanthnagara and Ramandurg areas. The chief ores are wad and psilomelane and usually they occur as a mixture of wad and psilomelane. The better grades of ores are found in the Kumaraswamy area. Lateritization has played an important role in the concentration of manganese and Iron in the profile, giving rise to rich accumulation of manganese and Iron ore for which this schist belt is well known.

(Source: Geology of Karnataka-BP Radhakrishna & R Vaidyanathan)

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 hold is in extreme end of SW part of Devadari gudda range of Sandur Schist Belt. There are four ore bands in the mining area is occurring at the top of the hillocks, show a generalized NW-SE trend of the foliation, which dip mainly towards northeast with angles varying from 70^{O} to 75^{O}. Ore bodies are bifurcated by ferruginous shale. In the main ore body at three places siliceous ore (BHQ) bands are exposed. The strike length of the ore body is varying from 150m to 400m. The total cumulative strike length of all the four ore bodies is about 900m. The width of the ore bodies varies from 15m to 60m.

The iron ore occurs both as lumps and fines. On an average the lumpy portions of the ore zone produce about 30% of the ROM. Rest is fine material of -10mm size. The ore bodies are steel grey to cherry red colored thick laminated to hard lumpy ore at top portions. And gradually as depth increases the powdery nature also increases and finally blue dust will remain at bottom levels. The grade of different category of iron ore of these ore bodies varies from 35% Fe (siliceous) to 64% Fe (high grade) with an overall average grade of 52.19%Fe. In total the ratio of lumpy (+10mm) ore to Powdery (-10mm) ore is around 30:70.

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 4 nos. of Core drill holes (189.80m) and 15 nos. of RC drill holes (691m) during 2016 at a grid level varies from 50 to 110m. The core holes are of 72mm dia and RC holes are of 6.5" dia. These bore holes are marked in Geological Plan and borehole logs are enclosed as Annexure-14.

Table- 9: Details of drilled boreholes-RC

Borehole no.	Co-Ordinates (WGS-84)		Level (mRL)	Depth (m)	Inclination	Grid in m (Influence)	Category
	Northing	Easting					
MBMR-1	1662590	671386	999.78	25.00	90°	60	G1
MBMR-2	1662646	671272	963.61	25.00	90°	70	G1
MBMR-3	1662478	671376	997.56	25.00	90°	60	G1
MBMR-4	1662312	671142	1003.03	51.00	90°	60	G1
MBMR-5	1662447	671521	1017.61	25.00	90°	90	G1
MBMR-6	1662561	671315	959.08	25.00	90°	60	G1
MBMR-7	1662359	671221	969.02	70.00	90°	60	G1
MBMR-8	1662505	671246	936.46	87.00	90°	60	G1
MBMR-9	1662749	671070	968.19	09.00	90°	85	G1
MBMR-10	1662749	671413	912.00	78.00	90°	70	G1
MBMR-11	1662391	670964	962.17	100.00	60°	110	G2
MBMR-12	1662408	671159	974.09	50.00	90°	50	G1
MBMR-13	1662519	671480	1015.63	31.00	60°	60	G1
MBMR-14	1662696	671182	935.32	55.00	90°	80	G1
MBMR-15	1662704	671289	940.85	35.00	60°	50	G1
TOTAL				***691.00***			

Table- 10: Details of drilled boreholes-Core

Borehole no.	Co-Ordinates (WGS-84)		Level (mRL)	Depth (m)	Inclination
	Northing	Easting			
MBM-16	1662786	671303	913.03	58.60	90°
MBM-17	1662393	671086	997.78	70.00	60°
MBM-18	1662425	671299	946.13	40.90	90°
MBM-19	1662589	671204	932.89	20.30	90°
			TOTAL	***189.80***	

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

779 nos. of samples from 15 nos. of RC and 4 nos. of core boreholes with 61 check samples were analyzed for Fe, SiO_2, and Al_2O_3 % by XRF at MECL Lab., Utilities Complex, Nagpur. Average grade of 52.19% Fe, 9.74% SiO_2 and 6.85% Al_2O_3 has been estimated for the total reserves/resources estimated.

iv) Expenditure incurred in various prospecting operations:

Cost of exploration (including survey etc) as per LOI of Govt of Karnataka is Rs. 28,916,848 /- (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 1:2000

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 1:2000

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-II c on a scale of 1:2000

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 know the variation in grade and recovery, lessee proposes to drill 15 nos. of core bore holes to a total depth of 710m the first year of this plan period. Proposed boreholes detailed below and are marked in the Geological Plan.

Table-11: Proposed Bore Holes

Borehole no.	Co-Ordinates (WGS-84)		Level (mRL)	Depth (m)	Incli-nation
	Northing	Easting			
PBH-1	1662337	671174	980	50	90^0
PBH-2	1662506	671292	943	50	90^0
PBH-3	1662462	671230	938	60	60^0
PBH-4	1662388	671124	982	50	60^0
PBH-5	1662656	671378	988	50	90^0
PBH-6	1662674	671319	967	70	90^0
PBH-7	1662612	671230	930	40	90^0
PBH-8	1662771	671361	915	60	60^0
PBH-9	1662650	671206	938	40	90^0
PBH-10	1662451	670925	952	30	90^0
PBH-11	1662432	670898	936	40	90^0
PBH-12	1662817	671347	890	50	90^0
PBH-13	1662770	671281	928	30	90^0
PBH-14	1662916	671301	840	50	90^0
PBH-15	1662881	671251	889	40	90^0
TOTAL				**710**	

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.**

Detailed exploration has been carried out by MECL and estimation of reserves/resources were made by MECL by geological cross section method at threshold cutoff of 45% Fe. MECL have taken Dip continuity up to 50m on either side of the iron ore intersection of the borehole for G1 category, next 50 to 100m has been placed under G2 Category and beyond 100m has been placed

under G3 category of UNFC. In order to derive the true horizontal and vertical thicknesses, corrections were applied. Thus, for strike correction and dip correction, the factor of 1.154 and 0.86 have been applied respectively. Bulk density of 3.5 T/m^3 has been considered. A call factor of 10% reduction has been applied to arrive the net geological reserves.

Table -12: Summary of Mineral Reserves / Resources (MECL report)

Category	Qty in million T
G1	5.950
G2	2.969
G3	0.719
Total in-situ reserves	9.638
Net geological reserves (90%)	8.674
After application of correction factor	7.577
Average grade	52.19 Fe %

Annexure-8 gives the detailed table showing estimation of reserves/resources.

However, resource/reserves were updated by cross sectional method considering the IBM threshold values (+45% Fe for Iron Ore, +35% Fe for Siliceous 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 (121) 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). Part of unexplored lease area devoid of mineral exposure is grouped under G4.

Table 13: Category wise area of Exploration

Category	Area (Ha.)
G1	17.41
G2	00.44
G3	03.24
G4	03.38
Total	24.47

Although MECL has considered Bulk Density as 3.5 tons/cum which is high. However, a Bulk density of 3.0 tons/cum is considered for iron ore and for Siliceous ore, it is 2.8 tons/cum based on the experience in the sector. BD for waste is 2.0 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 90% has been considered. Remaining 10% 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 June 2019.

Table-14: Proved Mineral Reserves (111)

IRON ORE							SILICEOUS IRON ORE					
Sec-tions	Area sqm	Influ Mtr	Volume Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volume Cum	BD t/cum	Quantity tonnes	Recovery 90%
S2-S2'	5417	60	325020	3.0	975060	877554	738	60	44280	2.8	123984	111586
S2a-S2a'	2916	50	145800	3.0	437400	393660	181	50	9050	2.8	25340	22806
S3-S3'	2853	60	171180	3.0	513540	462186	1281	60	76860	2.8	215208	193687
S4-S4'	3829	70	268030	3.0	804090	723681	0	70	0	2.8	0	0
S4a-S4a'	2227	50	111350	3.0	334050	300645	0	50	0	2.8	0	0
S5-S5'	1100	80	88000	3.0	264000	237600	0	80	0	2.8	0	0
			1109380		**3328140**	**2,995,326**			**130190**		**364532**	**328,079**

Table-15: PROBABLE MINERAL RESERVES (121)

IRON ORE						
Sec-tions	Area sqm	Influ Mtr	Volume Cum	BD t/cum	Quantity tonnes	Recovery 90%
S4a-S4a'	600	50	30000	3.0	90000	81000
			30000		**90000**	**81,000**

Table-16: Feasibility Mineral Resources (211)

IRON ORE							SILICEOUS IRON ORE					
Sec-tions	Area sqm	Influ Mtr	Volume Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volume Cum	BD t/cum	Quantity tonnes	Recovery 90%
S3-S3'	2530	60	151800	3.0	455400	409860	450	60	27000	2.8	75600	68040
S4-S4'	2197	70	153790	3.0	461370	415233	0	70	0	2.8	0	0
S5-S5'	1247	80	99760	3.0	299280	269352	0	80	0	2.8	0	0
			405350		**1216050**	**1,094,445**			**27000**		**75600**	**68,040**

Table-17: Inferred Mineral Resources (333)-Iron Ore

Sec-tions	Area sqm	Influ Mtr	Volume Cum	BD t/cum	Quantity tonnes	Recovery 90%
S2-S2'	2190	60	131400	3.0	394200	354780
S2a-S2a'	4532	50	226600	3.0	679800	611820
S4-S4'	3729	70	261030	3.0	783090	704781
S4a-S4a'	3302	50	165100	3.0	495300	445770
S5-S5'	150	80	12000	3.0	36000	32400
S6-S6'	3386	80	270880	3.0	812640	731376
			1067010		**3201030**	**2,880,927**

I) 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-18: Total resources as on June 2019

Level of Exploration	Iron Ore (million tonnes)			Grade
	Normal	Siliceous	Total	Fe%
G1 - Detailed exploration	4.090	0.396	4.486	52.19
G2 - General Exploration	0.081	--	0.081	
G3 – Prospecting	2.881	--	2.881	
G4- Reconnaissance	--	--	--	

Reserves and resources are arrived after applying results of feasibility and economic evaluation (Pl Annexure-12) based on the various factors such as:

a) Open cast mining method, recovery factor as 90%
b) Cutoff grade of +45% for normal ore/ +35% Fe for Siliceous ore and ultimate pit depth
c) Mineral / ore blocked at lease boundary.

Table – 19: Resources and Reserves (As on June 2019)

Category	UNFC	Iron ore in tonnes			
		Normal +45% Fe	Siliceous +35-45% Fe	Total	Avg Grade
A. Total Mineral Reserves					
Proved Mineral Reserves	G1 -111	2,995,326	328,079	3,323,405	52.19%
Probable Mineral Reserves	G2- 121	81,000	-	81,000	Fe
B. Total Remaining Resources					
Feasibility Mineral Resource	G1-211	1,094,445	68,040	1,162,485	
Prefeasibility Mineral	G2-221				
Measured Mineral Resource	G1- 331				
Indicated Mineral Resource	G2- 332				
Inferred Mineral Resource	G3- 333	2,880,927	-	2,880,927	
Total (A+B)		**7,051,698**	**396,119**	**7,447,817**	

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: The mining operations were earlier carried out by open cast, mechanized mining method and this will be continued. The mine had been worked by fully mechanized open cast method by deploying HEMM equipment *i.e.,* Hydraulic shovel/Wheel loaders, Tippers, Drills, etc. Iron ore excavated was being hauled to the crushing and screening plant for processing. Hydraulic excavators were used for handling of waste and the waste was dumped in the designated area. Drilling / blasting was carried out with suitable spacing and burden.

Two pits have been worked in the mine - one on the centre (P-1) and other on the western side (P-2) of the ML area. The pit workings are found to be unsatisfactory and quite unsystematic. The bench heights and berm widths have not been maintained properly.

Table -20: Existing pit details

Pit No.	Area (Dimensions)	Top mRL	Bottom mRL	Bench Nos.	Avg. Height	Avg. Width	UTM Co-ordinates	
							Northing	Easting
P1	9.57 Ha (L 500m x B 180 m)	935	1014	11	7m	7m	1662255	671010
							1662870	671409
P2	0.53 Ha (L 125m x B 45m)	917	972	7	7m	6m	1662332	670872
							1662475	670977

Encroachment of central pit outside the lease area has been observed. The encroachments of the mining pits are designated serially as EP-1, EP-2 & EP-3 of the pit P-1 encroached towards south, west-central and north respectively and EP-4 of the pit P-2, which accounts for a major portion of the pit. A total of 4 Inactive Dumps (IDs) comprising of OB material are in the ML area and are designated serially as ID-1 to 4. Apart from this, four ROM stocks are also present (MS-1 to 4). The details of the same are given below.

Table-21: Existing dump details

Dump No.	Extent ha	Quantity (Tonnes)	Top mRL	Bottom mRL	UTM Co-ordinates	
					Northing	Easting
ID 1	1.15	143640	990	884	1662200	670908
					1662253	671072
ID 2	0.19	2520	970	933	1662253	670900
					1662419	670952
ID 3	1.77	44150	1002	940	1662612	670974
					1662776	671200
ID 4	0.22	1350	930	915	1662824	671146
					1662886	671262

Table-22: Existing ROM stock

Dump No.	Extent ha	Quantity (Tonnes)	Top mRL	Bottom mRL	Avg Grade-Fe%	UTM Co-ordinates	
						Northing	Easting
MS-1	0.96	41472	967	930	57.6	1662238	670930
						1662446	671057
MS-2	0.26	18780	1003	974	59.2	1662280	671062
						1662395	671151
MS-3	0.02	336	939	937	55.2	1662551	671202
						1662567	671220
MS-4	0.03	1152	935	931	53.5	1662595	671202
						1662626	671226

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 lump and fine ore.

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

Production planning has been made in the P-1 pit only, within the proved limits. Proposed production quantity per annum will be 1.24 lakh tonnes of iron ore as per CEC approval. The details of excavation program is explained in next sections.

Brief Description of year wise workings:

I Year : In this year, mining will be between sections S2-S2' to S4a-S4a' over an area of 0.95 ha by making four benches pushing towards west. In this year the total production quantity will be 1.24 lakh TPA (0.92 lakh Normal ore +45% Fe + 0.32 lakh tons of Siliceous Ore) and corresponding waste handling will be 9,344 tonnes. Waste will be dumped in 0.11 ha area in a single stage of 10m.

II Year: In this year also, mining will be between sections S2-S2' to S4a-S4a' over an area of 2.11 ha making six benches towards W. In this year the total production quantity will be 1.24 lakh TPA (0.94 L tons Normal Ore + 0.30 L tons Siliceous ore) and corresponding waste handling will be 9,636 tonnes. Waste will be dumped in 0.17 ha area over two stages of each 10m.

III Year: In this year also, mining will be between sections S2-S2' to S4a-S4a' over an area of 1.21 ha making seven benches. Benches will be moved in both E & W directions. In this year the total production quantity of +45% Fe grade Normal ore will be 1.24 lakh TPA and corresponding waste handling will be 9,182 tonnes. Waste will be dumped in 0.25 ha area over three stages of each 10m.

IV Year: In this year, mining will be between sections S2-S2' to S4-S4' over an area of 3.15 ha making five benches towards east. In this year the total production quantity of +45% Fe grade Normal ore will be 1.24 lakh TPA and corresponding waste handling will be 16,276 tonnes. Waste will be dumped in 0.50 ha area over four stages of each 10m.

V Year: In this year, mining will be in sections S2-S2', S2a-S2a' and S3-S3' over an area of 4.45 ha making nine benches towards east. In this year the total production quantity of +45% Fe grade Normal ore will be 1.24 lakh TPA and corresponding waste handling will be 92,036 tonnes. Waste will be dumped in 1.58 ha area over five stages of each 10m.

I. Insitu Tentative Excavation

Table- 23: Year wise Production Program in Cum

Year	Pit no.	Total tentative Excavation	Top Soil	OB/SB /IB	ROM		Mineral rejects	ROM/ Waste Ratio
					Iron Ore	Siliceous Ore		
1	2	3	4	5	6	7	8	9
First	1	46,720	-	4,672	30,780	11,268	-	1:0.11
Second		46,830	-	4,818	31,347	10,665	-	1:0.11
Third		45,910	-	4,591	41,319	0	-	1:0.11
Fourth		49,430	-	8,138	41,292	0	-	1:0.20
Fifth		87,310	-	46,018	41,292	0	-	1:1.11

Table- 24: Year wise Production Program in tonnes

Year	Pit no.	Total tentative Excavation	Top Soil	OB/SB /IB	ROM		Mineral rejects	ROM/ Waste Ratio
					Iron Ore	Siliceous Ore		
1	2	3	4	5	6	7	8	9
First	1	133,234	-	9,344	92,340	31,550	-	1:0.08
Second		133,539	-	9,636	94,041	29,862	-	1:0.08
Third		133,139	-	9,182	123,957	0	-	1:0.07
Fourth		140,152	-	16,276	123,876	0	-	1:0.13
Fifth		215,912	-	92,036	123,876	0	-	1:0.74

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.

Year wise Production and Development plans and sections are enclosed in 1:2,000 scale (Plate III a to e).

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. Central portion of the pit which is already exposed is proposed for production and development in this plan period. 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 1.24 lakh tonnes of iron ore along with maximum waste of 0.71 lakh tons. Total max handling will be about 1.95 (~2.0) 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.

Table-25: List of mining machinery

Type	Nos.	Size / Capacity	Make	Motive Power
Wagon drill / Compressor	1	115mm	Atlas Capsco	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	

Adequacy of 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 -26

Hourly capacity = (3600x BC x Sf x Ff x Tf x 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 = (3600x0.9x0.8x0.9x3x0.8)/35 = 160 tph	

Considering 300 working days x 7 hrs/day;

Yearly handling by an excavator = 160 x 7 x 300 = 3.36 lakh tons/annum.

Hence, an excavator is more than enough, as maximum proposed handling will be around 2.0 lakh TPA only. One will be standby.

Table -27: Tipper Requirement for transportation

Production		**Development**	
Production	1.24 LTPA	Development	0.71 LTPA
Working Days	300	Working Days	300
Production /Day	**413**	**Development /Day**	**237**
Effective working hours/day	7	Effective working hours/day	7
Production/hr	59	Production/Hr	34
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	413 tpd	Total Material to be handled	237 tpd
No of trips /day (14 T)	30	No of trips /day (14 T)	17
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 50% material out of total ore handling of 2.0 lakh TPA will require blasting i.e. 1.0 lakh TPA as most of the lithology is soft.

Hence, maximum material to be blasted per day = 1.0 lakh tons/300 days
= 333 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 = 333/157.5 = 2.1 (say 3)

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.

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 the fly-rock generation. The maximum no. of holes kept in one blasting will be around 25-30. 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 North-Western portion of the lease area where ore is already exposed, by fully mechanized open cast mining method by forming benches of 7m height and width. Drilling/blasting will be deployed for hard formations.

During this plan period, the work progress will be between section S2-S2' to S4a-S4a'. Production proposals will be restricted to the area classified under proved reserves (111) category of UNFC. Overall pit slope will be maintained at 45^0 with horizontal. The slope of the benches will be around 80^0. 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 topmost bench will be pushed back to facilitate the formation of benches properly. Ore zone is 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, sprinkling and afforestation will be by water tankers.

Table-28: Details of workings

Year	Pit no.	Area Ha	Sections	Advancement	No. of benches	Level mRL		UTM Co-ordinates	
						Top	Bottom	Northing	Easting
First	P-1	0.95	S2-S2' to S4a-S4a'	West	4	970	942	1662357	671178
								1662655	671187
Second		1.21	S2-S2' to S4a-S4a'	West	6	984	942	1662357	671163
								1662655	671187
Third		2.11	S2-S2' to S4a-S4a'	E & W	3	956	935	1662357	671163
								1662655	671317
Fourth		3.15	S2-S2' to S4a-S4a'	East	5	963	928	1662357	671163
								1662655	671342
Fifth		4.45	S2-S2' to S4a-S4a'	East	9	984	928	1662357	671163
								1662655	671358

Waste will be dumped in the north western portion of the lease area over the existing dump by forming terraces. Tippers of 16 tons capacity will be used to transport the waste generated from mine pit to the dump yard. The waste generation will be about 1.364 lakh tonnes in this plan period and proposed dumping area of 2.16 ha is enough to accommodate this waste. This area is in anti-dip side (footwall) of the ore body, away from UPL and boreholes drilled has proved this as non-mineralized area.

Table-29: Details of Waste Dumping

Year	Extent ha	Quantity tonnes	Top mRL	Bottom mRL	Stages Nos.	UTM Co-ordinates		Section line
						Northing	Easting	
First	0.11	13766	942	936	1	1662670	671149	S5-S5'
						1662117	671192	
Second	0.17	14067	950	936	2	1662670	671137	S5-S5'
						1662117	671192	
Third	0.25	13773	958	936	3	1662650	671100	S5-S5'
						1662115	671192	
Fourth	0.50	20864	972	936	4	1662626	671088	S5-S5'
						1662121	671192	
Fifth	01.58	96624	986	936	5	1662618	670965	S5-S5'
						1662172	671192	

Table-30: UPL parameters

Pit No.	Pit Area ha	Pit Dimension			
		Length (m)	Width (m)	Avg. Depth (m)	Slope
P1	11.99	450	270	90	45°
P2	01.35	135	100	60	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 IIIc. Year wise calculation of bench wise and section wise Production and Development are given in Annexure-9.

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.**

Considering the current exploration data and geology, working layout is designed for the proposed production of 1.24 lakh TPA. Considering proved and probable mineral reserves of this lease area of about 3.323 million tonnes, the life of the mine will be 26.8 years. However, after the proposed exploration, the resources will be converted to minable reserves and the lease period may extend up to 50 years of lease grant period.

Excavation: Based on the establishment of proved category of reserves after exploration as on day, the mining area as well as ultimate pit limits is designed. In the lease about 13.34ha area mineralized. In this plan period about 9.89 ha will be used for excavation and 13.34ha in the conceptual period. About 14 nos. of benches will be made at the end of the conceptual period. Out of these, bottom most four benches will be backfilled with waste and afforestation will be carried out over this backfilling as well as remining benches. The total pit of 13.34 ha area will be fenced in the post mining period. Kindly refer conceptual section S2-S2' in conceptual plan. Plate no. VI.

Disposal of waste dumps: The waste will be dumped in three locations (PPD, PD1, PD2) during life of mine including present mining plan period.

The PPD part of the dumping proposed in NW part of lease will be used for plan period dumping. The remaining area of this and another two areas PD1 and PD2 will be used for dumping in the conceptual stage. Total area marked for dumping in this plan period will be 4.80ha and during conceptual / life of the mine period is about 7.95 ha, which can hold around 0.70Mcum in total.

Dumping will be made in stages in retreating method from pit bottom by making terraces at every 10m height and by providing adequate engineering measures. Berms will be provided at the toe of each terrace to avoid water flow over the dump slopes. (Refer: conceptual plan plate no. VI).

In PPD, an area of 1.86 Ha will be used in plan period and remaining 0.47ha of this dumping area will be used for conceptual dumping. The total spread of the dump will be around 18500 sqm. (260m length x 71m width). The capacity of this dumping area is about 0.094 M cum. Dumping will be in 5 stages of each 10m height. This dump will be covered with coir matting and plantation after maturity.

Another dumping area, PD1 of 2.72 ha is located at SE part of the lease area. The capacity of this waste dump is about 0.346 M cum. There will be three terraces of dumping with 10m height in each stage. The total spread of the dump in this part will be around 19900 sqm. (240m length x 83m width). Protection measures like retention wall, garland drains will be provided before commencement of dumping. After maturity this dump will be stabilized with coir mat and suitable afforestation.

The third proposed dump PD2 is located at SW part of the lease area. In conceptual stage 5 to 9 stages of dumping with 10m height in each terrace will be made. The capacity of this dump will be about 0.254 Mcum. The spread of the dump will be around 25200sqm. (170m length x 148m width). Post mining, part of this dump will be used/rehandled for backfilling of worked out pit and remaining part will be stabilized suitably with coir mat and afforestation.
(Please refer conceptual sections S2-S2' and S2a-S2a', Plate no. VI)

Sub grade ore: No separate sub grade ore dump will be there during mining. The generated sub grade ore will be blended with high grade and transported.

Backfilling of voids: As on day there is no backfilling program. During post mining period some quantity of waste dumps will re-handled and backfilled in the workout pit and plantation will be done above that.

Reclamation and Rehabilitation:

The most of reclamation part of work will be carried out in first five years of plan period. In the remaining period of life of mine all structures and measures will be maintained properly. For protection of the mining area and to prevent further degradation of land and stabilization of dumps, the following measures are proposed inside lease area as per ICFRE report and these will be implemented in this plan period of five years. The details of implemenatation schedule of mitigation/Engineering Measures, Engineering measures for the management of waste dumps, Erosion control measures for the waste dumps, Water surface Management plan, Afforestation, Green belt development et., are discussed in the next chapter i.e., in Progressive Mine closure plan.

Land Use Pattern: Existing land use as well as proposed for this plan period and in conceptual stage is given below: (Ref: Conceptual plan plate no.VI)

Table-31: Land Use in Ha

Type	Existing	Plan period	Conceptual period	Post mining activity
Mining	09.89	09.89	13.34	Fencing, partially backfilling, afforestation
Dumping	04.80	04.80	07.95	Afforestation
Statutory building	00.05	00.10	00.10	Monitoring
Mineral stock	00.50	00.50	-	-
Road	00.40	00.40	00.40	Maintenance, Monitoring
Safety zone area	02.68	02.68	02.68	Afforestation
Untouched area	06.15	06.10	-	-
Total	**24.47**	**24.47**	**24.47**	

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 960 mRL and maximum depth of workings will be around 870 mRL.

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 rain water drains off from the plateau towards eastern side and goes in to the valleys.

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

Average annual rainfall in area is around 750mm. Whole lease area of 24.47 ha is catchment area for rainfall, hence the likely quantity of rain water that will be flowing through the lease area will be 1.835 lakh cum (0.75m x 24.47 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 DISPOSL 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.

Limonitic clay/lateritic clay: This is mainly friable material with yellowish to red in colour having fine grains.

BHQ: It is hard and compact layered rock formation with colour ranging from grey to black.

No mineral rejects generation as all +35% Fe material produced in this plan period is ROM.

Table -32: Year wise quantity in tonnes of Waste and others

Year	Topsoil		Waste		Mineral rejects		
	Reuse / Spreading	Storage	Backfilling	Storage	Blending	Storage	Beneficiation
First	-	-	-	9,344	-	-	-
Second	-	-	-	9,636	-	-	-
Third	-	-	-	9,182	-	-	-
Fourth	-	-	-	16,276	-	-	-
Fifth	-	-	-	92,036	-	-	-

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.

Waste will be dumped in the north western portion of the lease area over the existing dump by forming terraces. This area is in anti-dip side (footwall) of the ore body, away from UPL and boreholes drilled here have proved this as non-mineralized area. BH no. MBMR-14 drilled on section line S5-S5' has proved negative as it was drilled up to 55m meters. In this BH, initially upto 9m hard

BHQ is present having the average grade of 30.62% Fe and from 9m to 22m, an iron ore is present with intercalation of siliceous ore layers. Below this, from 22m to till the end (55m) only siliceous ore with intercalated bands of BHQ present with an average grade of 37.04% Fe. Hence, at present this zone cannot be worked out economically, hence shown away from the UPL. Further BHQ out crops of less than 35% Fe are present in the proposed dumping area. In section line 5-5' and 6-6' old waste dump is already present. Hence, dumping will be done over this existing dump in this plan period. After completion of proposed exploration, the plan will be modified-if necessary.

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 by terracing with average height of 10m with reverse slopes. No sub grade generation will be in this plan period.

Table-33: Details of Waste Dumping

Year	Extent ha	Quantity tonnes	Top mRL	Bottom mRL	Stages Nos.	UTM Co-ordinates	
						Northing	Easting
First	0.11	13766	942	936	1	1662670	671149
						1662117	671192
Second	0.17	14067	950	936	2	1662670	671137
						1662117	671192
Third	0.25	13773	958	936	3	1662650	671100
						1662115	671192
Fourth	0.50	20864	972	936	4	1662626	671088
						1662121	671192
Fifth	01.58	96624	986	936	5	1662618	670965
						1662172	671192

Table -34: Engineering measures for proposed dumping

Items	**Particulars of works**	**Dimension in m**			
		Length	**Width**		**Height**
			Top	**Bottom**	
TW-8: Toe Wall at the toe of the dump	Foundation in hard soil mixed with boulders including hard rock	655.00	3.15		0.60
	Plain cement concrete (1:4:8) in foundation	655.00	3.15		0.15
	RR Stone mansonry Dry	655.00	1.00	3.00	2.00
GD-8	Garland drain below the toe wall	663.00	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 – 35:

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:

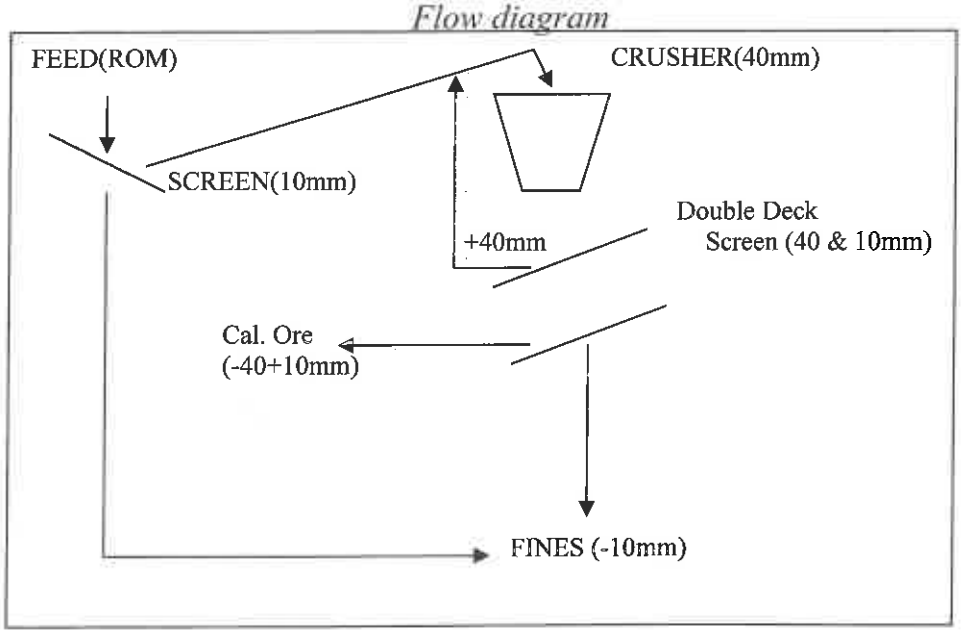
a) If processing / beneficiation of the ROM or Mineral Reject is planned to be conducted, briefly describe nature of processing / beneficiation. This may indicate size and grade of feed material and concentrate (finished marketable product), recovery etc.

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 +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 and material of -40mm+10mm 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.

Flow diagram



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

Table -36:

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.

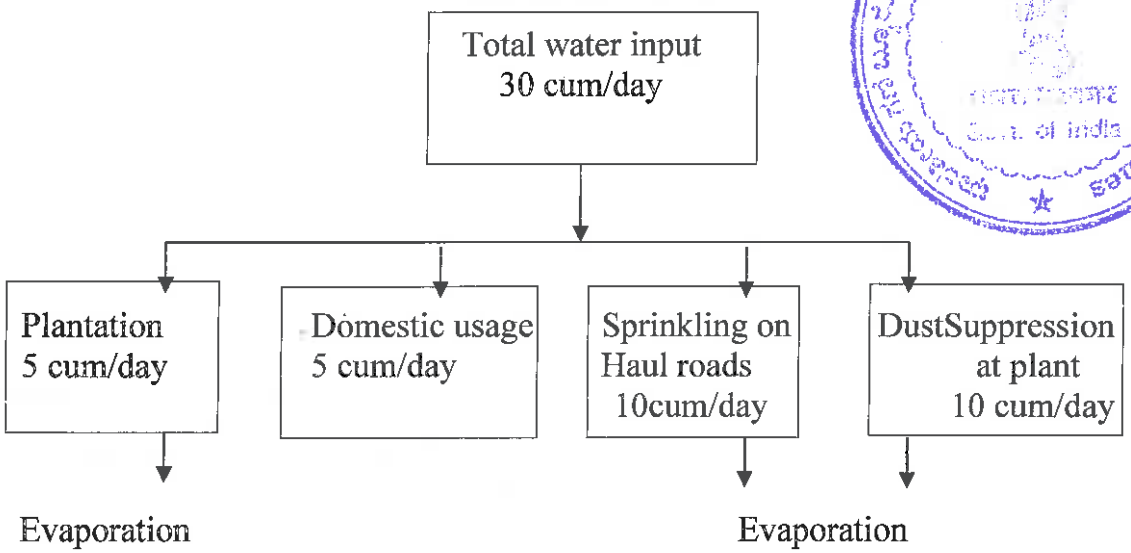
f) Specify quantity and type of chemicals to be stored on site / plant.

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. Sandur-Narayanapura village road is passing at the NE side of the lease at a km away. Water for drinking and domestic purposes will be sourced from the Borewell from the nearby area. Ranjitpura (2km) is the nearest railway station and Marmugoa is the nearest port (400km). Donimalai township (3km) is having all facilities like Police outpost, Hospital, Post Office, School, Workshops etc.

b) Employment potential:

Table – 37: 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-38: Existing land use

Type	Area-Ha
Mining	09.89
Dumping	04.80
Statutory building	00.05
Mineral stock	00.50
Road	00.40
Safety zone area	02.68
Untouched area	06.15
Total	**24.47**

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, Soymida 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 750mm. 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 16 villages situated within the buffer zone, with total population of 38,196 as per the census data.

Table -39 : Population Details

Sl No.	VILLAGE	House Holds	Total Population	Distance km
1	Lakshmipura	288	1316	7.1
2	Somalapur	51	300	8.5
3	Yeswanthanagar	954	5157	9.7
4	Dowlatpur	358	2178	7.7
5	Krishnanagar	693	4160	8.0
6	Muraripur	136	1138	10.0
7	Taranagar	976	5377	9.9
8	Bhujanganagar	867	4672	6.5
9	Ranjitpur	141	874	2.4
10	Vittalnagar	143	833	4.6
11	Deogiri	615	3224	4.3
12	Nandihalli	89	460	2.0
13	Ubbalagundi	240	1280	8.3
14	Donimalai Township	1507	6554	3.0
	TOTAL	**7058**	**37523**	--

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-40: Land Use

Type	Existing	Plan period	Conceptual period	Post mining activity
Mining	09.89	09.89	13.34	Fencing, partially backfilling, afforestation
Dumping	04.80	04.80	07.95	Afforestation
Statutory building	00.05	00.10	00.10	Monitoring
Mineral stock	00.50	00.50	-	
Road	00.40	00.40	00.40	Maintenance, Monitoring
Safety zone area	02.68	02.68	02.68	Afforestation
Untouched area	06.15	06.10	-	-
Total	**24.47**	**24.47**	**24.47**	

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 trough 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 will be implemented as proposed in the R&R report.

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-41: Summary of year wise proposal for item No. 8.3

Items	Details	Actual Position (as on Apr-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*	--	0.536 ha	0.536 ha	0.536 ha	0.536 ha	0.536 ha	1340 plants each year
	Reclamation & rehabilitation measures		R&R measures as given in next pages will be carried out					-
	Env. monitoring	Will be carried out as per guidelines, details of proposed monitoring program given below.						

- Plantation details are given in next pages in separate table no. 45.

Table-42: Proposed Env. Monitoring Program-Core Zone (As per the standard CFE guidelines)

Type	Location	Frequency
Ambient Air Quality (AAQ)	Mine head	Twice in a week at each location
	Crushing Plant	
	Haul Road	
	Dump Area	
Noise Monitoring	Mine head	Once in a Month at each location
	Crushing Plant	
Soil sampling	Mine site	Once in three months

Table-43: Proposed Env. Monitoring Program-Buffer Zone (As per the standard CFE guidelines)

Type	Location	Frequency
Ambient Air Quality (AAQ)	Ranjithpur	Twice in a week at each location
	Sandur	
	Swamihalli	
	Ubbalagandi	
Noise Monitoring	Nandihalli	Once in a Month at each location
	Swamihalli	
	Devgiri	
	Navalahatti	
	Ubballgandi	
	Ranjithpur	
	Bhujaganagar	
	Sandur	
Soil Sampling	Ubbalagandi	Once in three months
	Bhujaganagar	
	Swamihalli	
Water	Narihalla Back water	Once in three months
	Harishankar spring water	
	BMM camp Tubewell	
	Bujagangar Tubewell	
	Swamihalli Tubewell	

Dump management:

The proposed dumping area located towards NE side of the mine pit and is in continuation of existing waste dump (ID-3). Waste dumping made to a maximum height of 45 m in retreating method from pit bottom to top by providing terraces at every 10 m height and 8 m width by providing adequate engineering measures. Berms will be provided at the toe of each terrace to avoid water flow over the dump slopes.

Table -44: Engineering measures for Proposed Dumping

No.	Items	Particulars of works	Dimension in m			
			Length	Width		Height
				Top	Bottom	
Proposed dumping PBF	TW-8: Toe Wall at the toe of the dump	Foundation in hard soil mixed with boulders including hard rock	655.00	3.15		0.60
		Plain cement concrete (1:4:8) in foundation	655.00	3.15		0.15
		RR Stone masonry - Dry	655.00	1.00	3.00	2.00
	GD-8	Garland drain below the toe wall	663.00	2.00	1.00	1.00

Table-45: Engineering Measures for Existing dumps

No.	Items	Particulars of works	Dimension in m			
			Length	Width		Height
				Top	Bottom	
EID-1	TW-1: Toe Wall at the toe of the dump	Foundation in hard soil mixed with boulders including hard rock	186.00	2.15		0.60
		Plain cement concrete (1:4:8) in foundation	186.00	2.15		0.15
		RR Stone mansonry Dry	180.00	1.00	2.00	3.00
	GD-1	Garland drain below the toe wall	186.00	2.00	1.00	1.00
ID-1	TW-7: Toe Wall at the toe of the dump	Foundation in hard soil mixed with boulders including hard rock	180.00	2.15		0.60
		Plain cement concrete (1:4:8) in foundation	180.00	2.15		0.15
		RR Stone mansonry Dry	180.00	1.00	3.00	2.00
	GD-7	Garland drain below the toe wall	190.00	2.00	1.00	1.00
EID-2	TW-2: Toe wall at the toe of waste dump	Foundation in hard soil mixed with boulders including hard rock	202.00	3.15		0.60
		Plain cement concrete (1:4:8) in foundation	202.00	3.15		0.15
		RR Stone mansonry Dry	202.00	1.00	3.00	2.00
	GD-2	Garland drain below the toe wall	202.00	2.00	1.00	1.00
EID-3	TW-3: Toe wall at the toe of waste dump	Foundation in hard soil mixed with boulders including hard rock	57.00	3.15		0.60
		Plain cement concrete (1:4:8) in foundation	57.00	3.15		0.15
		RR Stone mansonry Dry	57.00	1.00	3.00	2.00
	GD-3	Garland drain below the toe wall	57.00	2.00	1.00	1.00
EID-4	TW-4: Toe wall at the toe of waste dump	Foundation in hard soil mixed with boulders including hard rock	108.00	3.15		0.60
		Plain cement concrete (1:4:8) in foundation	108.00	3.15		0.15
		RR Stone mansonry Dry	108.00	1.00	3.00	2.00
	GD-4	Garland drain below the toe wall	202.00	2.00	1.00	1.00
EID-5	TW-5: Toe wall at the toe of waste dump	Foundation in hard soil mixed with boulders including hard rock	841.00	3.15		0.60
		Plain cement concrete (1:4:8) in foundation	841.00	3.15		0.15
		RR Stone masonry Dry	841.00	1.00	3.00	2.00
	GD-5	Garland drain below the toe wall	841.00	2.00	1.00	1.00

Surface Water Management: The proposed engineering measures for the surface water management of the lease area are given below:

- **Loose Boulder Check Dam (LBCD)**: (Random Rubble dry stone masonry): **15 LBCDs** of 6 to 10 m length are proposed for the *nalas* in the lease area.
- **Gabion (Wire crate) Check Dam (GCD)**: Altogether, **2 GCDs** of a length varying from 10 to 15 m are proposed for the *nalas* within and outside lease area.
- **Stone Masonry Check Dam (SMCD):** A total number of **5 SMCDs** are proposed for the *nalas* in the lease area.

- **Silt Settling Tank (SST):** A total number of **2 SSTs** of a dimension of **20 x 10 x 3 m** are proposed for the *nalas* in the lease area.
- **Rainwater Harvesting Pit (RWHP):** One **RWHP** (10 x 5 x 3 m) is proposed for the protection of surface runoff in the lease area.

Afforestation:

Afforestation of the safety zone green belt area is to be taken up now. Afforestation covering 1000 trees and 2500 shrubs per ha, inclusive of maintenance for five year has been worked out as per the norms of State Forest Department, Karnataka.

Table-46: Year wise details of Plantation

Year	Area (ha)	Saplings (nos.)	Survival Rate	Species	UTM Co-ordinates	
					Northing	Easting
First	0.536	1340	80%	As per R&R recommendations Pongamia pinnata (Honge), Cacia cimia (sime tangadi), Hardiwika binaath etc.,	1662800	671093
					1662982	671428
Second	0.536	1340			1662639	670878
					1662809	671355
Third	0.536	1340			1662300	670852
					1662645	671206
Fourth	0.536	1340			1662132	670866
					1662420	671287
Fifth	0.536	1340			1662377	671283
					1662795	671575

Table -47: Implementation Schedule of Mitigation / Engineering Measures

Type	Particulars of work	Years				
		1	2	3	4	5
EID/ID	Toe wall at the toe of waste dump	√				
	Garland drain	√				
Proposed Dump/PBF	Toe wall at the toe of waste dump	√	√	√	√	√
	Garland drain	√	√	√	√	√
Gully plugs	Loose Boulder check dam (dump)	√	√			
	Logwoodcheck dam(dump)	√	√	√	√	√
	Brushwoodcheck dam(dump)	√	√	√	√	√
Check dams	Gabion/Wire crate check dam	√				
	Rainwater harvesting pit	√				
	Silt settling tank	√				
	Stone masonry check dam	√				
	Loose Boulder check dam	√				
Greenbelt development		√	*Gap filling*			
Afforestation		√	√	√	√	√
Environmental monitoring & watch & ward		√	√	√	√	√

Table-48: Summary of the cost of proposed measures

Sl. No.	Item of work	Cost (Lakh Rs.)
1.	Afforestation for encroachment area	37.41
2.	Engineering structures for waste dump management	82.60
3.	Engineering structures for Surface water management	20.93
4.	Afforestation of the total area at the conceptual stage	35.58
5.	Afforestation of area under greenbelt	6.89
Grand Total		**Rs. 183.41**

8.4 Disaster Management and Risk Assessment:

The disaster and the risk may occur due to natural calamity such as earthquake, 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 A.–Cell: 9480267877, Mines Manager,
Kirloskar Bharath Mines, near Nandihalli, Sandur taluk, Bellary 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 45 degrees and providing the safety equipment will be strictly adhered.

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 18.37 ha.

Table-49: 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	09.89	-	09.89	--	09.89
2	Storage for topsoil	-	-	-	--	-
3	Overburden dump	04.80	-	04.80	--	04.80
4	Mineral stock	00.50	-	00.50	--	00.50
5	Statutory Buildings	00.05	+00.05	00.10	--	00.10
6	Roads	00.40	-	00.40	--	00.40
7	Railways	-	-	-	--	-
8	Green belt / safety zone	02.68	-	02.68	-	02.68
9	Crushing plant	-	-	-	-	-
10	ETP	-	-	-	-	-
11	Township area	-	-	-	-	-
12	Biodiversity Area	--	-	-	-	-
13	Others-*Un used*	06.15	-00.05	06.10	Nil	-
	Grand Total	**24.47**		**24.47**	**-**	**18.37**

This Mining Plan is approved subject to the conditions / stipulations indicated in the Mining Plan approval letter No. ....F.7/1099/2019/ENG Date..24.5.2019

24/5/19

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

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

CONSENT LETTER/ UNDERTAKING/ CERTIFICATE:

01. The Mining Plan of Kirloskar Bharat Mines [M/s Bharat Mines & Minerals (ML No.2245) mine lease block] over an extent of 24.47 ha located in Nandihalli Village of Sandur Taluk, Ballari Dist., Karnataka under *Rule 16 of MCR 2016* has been prepared by Mr.Sripad Pujar and Mr.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**
Rock Tech Enterprises, Annapurna Badavane,
HOSPET – 583 201, Ballari Dist. Karnataka State.

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 Bharat Mines [M/s Bharat Mines & Minerals Limited (ML No.2245) mine lease block] over an extent of 24.47 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 24.47ha, in Nandihalli village of Sandur Taluk, Bellary Dist., 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".

for **Kirloskar Ferrous Industries Ltd**

Ravindranath Venkatesh Gumaste

Managing Director
Nominated Owner

Place: Bevinahalli
Date: 15.04.2019

CERTIFICATE FROM QP

The provisions of the Mineral Conservation and Development Rules, 2017, have been observed in the preparation of Mining Plan of Kirloskar Bharath Mines [M/s Bharath Mines & Minerals (ML No.2245) mine lease block] over an extent of 24.47 ha located in Nandihalli village of Sandur Taluk, Ballari Dist., Karnataka 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: 20.05.2019

PHOTOGRAPHS

Kirloskar Bharath Mines – Photographs

Two views of mine workings-Pit no. 1

View of mine workings-Pit no.2

Views of old dump

Views of old dump and proposed backfiilling area

Photos of few Boundary Pillars

ANNEXURES

ANNEXURE- I

GOVERNMENT OF KARNATAKA

No:DMG/MLS/AUC/'C'-2245/2018-19

Office of the Director
Department of Mines and Geology,
KhanijaBhavan, Race Course Road
Bangalore-1, Date: 06.10.2018
Email id: dir-mines@karnataka.gov.in

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

Sub: Letter of Intent with reference to e-auction dated **04.09.2018** for grant of iron ore mining lease for **"M/s Bharath Mines & Minerals, ML No: 2245"** Block in Nandihalli village, Sandur Taluka, Ballari District over an extent of 24.47 Hectare Area of Forest land.

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 30 January 2018 for grant of mining lease for **"M/s Bharath Mines & Minerals, ML No: 2245"** located in Nandihalli village, Sandur Taluka, Ballari 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(9)(iii) of the Mineral (Auction) Rules, 2015 including its amendments.

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

1.2. The upfront payment for " **M/s Bharath Mines & Minerals, ML No: 2245**" Block is **Rs. 3.81.61,718/- (Rupees Three Crore Eighty One Lakhs Sixty One Thousand Seven Hundred and Eighteen 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. **38.16,172/-** through Demand Draft (DD) bearing No. 025616 dated: 14.09.09.2018 which was received on 14.09.2018.

1.3. With reference to letter No. DMG/MLS/CCA/12/2016-17 dated 23.08.2018 issued by DMG during the bid evaluation stage and thereupon the declaration submitted. **Kirloskar Ferrous Industries Limited** has submitted the revised bid security on 11.09.2018 for maintaining bid validity as 510 days from the Bid Due Date (i.e. 20th August 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 Bharath Mines & Minerals, ML No: 2245**" Block in Nandihalli village. Sandur Taluka. Ballari District over an extent of 24.47 Hectare Area of Forest land 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 declared as the "**Successful Bidder**" and subsequently be granted the mining lease only upon satisfactory completion of all requirements under the Judgment. Act. 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.

(a) Declaration of the **"Successful Bidder"**:

Kirloskar Ferrous Industries Limited 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 38,16,172/-(Rupees Thirty Eight Lakhs Sixteen Thousand One Hundred and Seventy Two 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. 3,81,61,718/- (Rupees Three Crore Eighty One Lakhs Sixty One Thousand Seven Hundred and Eighteen 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

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 2,89,16,848/-(Rupees Two Crore Eighty Nine Lakhs Sixteen Thousand Eight Hundred and Forty Eight 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. 3,05,29,374/- (Rupees Three Crore Five Lakhs Twenty Nine Thousand Three Hundred and Seventy Four Only)**. Upon such payment, the Government of Karnataka shall issue a grant order and thereafter within a period of 30 days a mining lease shall be executed in favour of **Kirloskar Ferrous Industries Limited** as per Rule 10(6) of The Mineral (Auction) Rules, 2015 . 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.**

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 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 22.10.2018.

DIRECTOR
Department of Mines & Geology.
6/10/2018

ANNEXURE - 1/a

MONITORING COMMITTEE

No.MC/R&R/CCA/2018-19/124

Khanija Bhavan, Race Course Road,
Bangalore-1, date. 26.03.2019.

NOTICE

Sub: Concurrence of CEC on final Rehabilitation & Reclamation Plan- intimation reg.

Ref.1: Letter of CEC No.2-61/CEC/SC/2017-Pt.III, dated 5th March, 2019.
2: LOI issued to the Preferred Bidder dated 06.10.2018.
3: Letter of Director, DMG dated 25.03.2019.

*****

The ICFRE has submitted the final Rehabilitation & Reclamation Plan of M/s Bharat Mines and Minerals and the same has been approved by the Central Empowered Committee vide letter cited above in the reference 1 recommending the annual production of iron ore as below;

Name of the Mining Lease	ML No.	Permissible annual production of iron ore mine
M/s Kirlosker Ferrous Industries Ltd erstwhile M/s Bharat Mines and Minerals	2245	0.124 MMT

The Monitoring Committee has also been informed by the Director, Department of Mines and Geology vide reference 2 above that you have been declared as Preferred Bidder for the said mine by submitting the highest bid in the auction conducted by the Government of Karnataka. Accordingly, Letter of Intent has also been issued to you on 06.10.2018. As per the orders of the Hon'ble Supreme Court, the R&R Plan proposed by ICFRE and approved by the CEC shall have to be implemented before starting of mining operations. You are requested to start implementation of the R&R Plan only after obtaining approval from the Director, DMG. You are also directed to submit one copy of the approved Mining Plan, Environmental Clearance, approval under the Forest (Conservation) Act, 1980, and other statutory clearances in tune with the annual production of 0.124 MTPA.

Chairman,
Monitoring Committee

To,
M/s Kirloskar Ferrous . Ltd,
Laxmanrao Kirloskar Road,
Khadki, Pune- 411003,
Maharashtra.

Copy with compliments to,

1. Director, Department of Mines & Geology, Bangalore for information and necessary action.
2. Regional Controller of Mines, IBM, No.29 Industrial Suburb, II Stage, Tumkur Road, Goruguntepalya, Yeshwanthpur, Bangalore for information and necessary action.
3. Principal Chief Conservator of Forests, Aranya Bhavana, Malleshwaram, 18th Cross, Bangalore for information and necessary action.
4. Member Secretary, KSPCB, No.49, Parisara Bhavan, Church Street, Bangalore-560001 for information and necessary action.
5. Deputy Director General, Department of Mines Safety, No.5, 17th Main, 100 Feet Road, Bangalore for information and necessary action.
6. Deputy Commissioner, Bellary District for information and necessary action.
7. DCF, Bellary district for information and necessary action.
8. Deputy Director, Department of Mines & Geology, Hospet for needful action.

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

ANNEXURE - 2

7 of 32

प्रारूप० आई० आर०
Form I. R.

निगमन का प्रमाण-पत्र

CERTIFICATE OF INCORPORATION

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

मैं एतद्द्वारा प्रमाणित करता हूं कि आज.....
.....
.....

कम्पनी अधिनियम 1956 (1956 का 1) के अधीन निगमित 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
N B Ektare
Authorised Signatory

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

ANNEXURE-3

KIRLOSKAR FERROUS INDUSTRIES LIMITED Enriching Lives
A Kirloskar Group Company

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	00082629	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

KIRLOSKAR FERROUS INDUSTRIES LTD. INDIA (PUNE)

SRIPAD PUJAR
QUALIFIED PERSON

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

B.V.R. ACHAR
QUALIFIED PERSON

Regd. Office : Laxmanrao Kirloskar Road, Khadki, Pune - 411 003, Maharashtra, India
Phone : +91 (20) 25810341 Telefax : +91 (20) 25810208, 25810208 Email : investor@kfil.com Website : www.kfil.com
CIN No. L27101PN1991PLC063228

ANNEXURE-4

Indian Bureau of Mines
Govt. of India

KIRLOSKAR FERROUS INDUSTRIES LIMITED
A Kirloskar Group Company

Enriching Lives

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

KIRLOSKAR FERROUS INDUSTRIES LTD. INDIA (PUNE) SECRETARIAL

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

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

Regd. Office : Laxmanrao Kirloskar Road, Khadki, Pune - 411 003, Maharashtra (India)
Phone : +91 (20) 25810441, Telefax : +91 (20) 25813208, 25810283 Email : investor@kfil.com Website : www.kfil.com
CIN No. L27104PN1965PLC082223

ANNEXURE -5

ಭಾರತೀಯ ವಿಶಿಷ್ಟ ಗುರುತು ಪ್ರಾಧಿಕಾರ

ಭಾರತ ಸರ್ಕಾರ

Unique Identification Authority of India

Government of India

ದಾಖಲಾತಿ ಕ್ರಮ ಸಂಖ್ಯೆ / Enrollment No.: 1189/03258/00774

To

Gumpala Ravindranath Venkatesh

S/O: Venkatesh Jaya Gumpala

House No 27-34 1 S R School Road

Near Muncipl Ground Annapurna Badavane,

Chittawadigi

Hospet

Hospet

hospet Bellary

Karnataka 583201

9448401032

12/01/2016

128532033

MA285320357FT

ನಿಮ್ಮ ಆಧಾರ್ ಸಂಖ್ಯೆ / Your Aadhaar No. :

3813 9113 5794

ಆಧಾರ್ - ಶ್ರೀಸಾಮಾನ್ಯನ ಅಧಿಕಾರ

ಭಾರತ ಸರ್ಕಾರ

Government of India

Gumpala Ravindranath Venkatesh

ಪುರುಷ / Male

3813 9113 5794

ಆಧಾರ್ - ಶ್ರೀಸಾಮಾನ್ಯನ ಅಧಿಕಾರ

भारतीय खान ब्यूरो Indian Bureau of Mines

ಭಾರತ ಸರಕಾರ

भारत सरकार

Govt. of India

SRIPAD PUJAR

QUALIFIED PERSON

B.V.R. ACHAR

QUALIFIED PERSON

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ
ಗುಲಬರ್ಗಾ

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಕುಲಾಧಿಪತಿ,
ಕುಲಪತಿ ಹಾಗೂ ಸೆನೆಟ್ ಸದಸ್ಯರಾದ ನಾವು

ಶ್ರೀ ಪೂಜಾರ್ ಶ್ರೀಪಾದ

ಅವರು ಮಾಸ್ಟರ್ ಆಫ್ ಸೈನ್ಸ್ (ಖನಿಜ ಅನ್ವೇಷಣಾ ವಿಷಯ)
ಅಂತಿಮ ಪರೀಕ್ಷೆಯಲ್ಲಿ(ಮೇ ೧೯೮೬) ಪ್ರಥಮ ವರ್ಗದಲ್ಲಿ
ಉತ್ತೀರ್ಣರಾದುದರಿಂದ ಅವರಿಗೆ

ಮಾಸ್ಟರ್ ಆಫ್ ಸೈನ್ಸ್

(ಖನಿಜ ಅನ್ವೇಷಣೆ ವಿಷಯ)

ಪದವಿಯನ್ನು ಗುಲಬರ್ಗಾದಲ್ಲಿ ಒಂದು ಸಾವಿರದ ಒಂಭತ್ತ
ನೂರ ಎಂಬತ್ತಾರನೆಯ ಮೇ ತಿಂಗಳ ನಾಲ್ಕನೆಯ ದಿನದಲ್ಲಿ ನೀಡಿದ್ದೇವೆ.
ಈ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಮುದ್ರೆ ಮತ್ತು ಕುಲಪತಿಗಳ
ಮುದ್ರೆಗಳಿಂದ ಇದನ್ನು ಪ್ರಮಾಣೀಕರಿಸಲಾಗಿದೆ.

ಕುಲಪತಿ
Vice-Chancellor

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

Certify that

Shri Pujar Sripad

having been examined for the Degree of Master of
Science in Mineral Exploration and a project
work has been passed in Second Class (May 1986)
in the First Class the Degree of

MASTER OF SCIENCE

Mineral Exploration

has been conferred on him/her at Gulbarga on the
Fifth day of the month of April in the year
One thousand nine hundred and eighty six.

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

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

Bureau of Mines
Government of India

ANNEXURE-6

Tungabhadra Minerals Ltd.,
ADMINISTRATIVE OFFICE

TARANAGAR 583 119.
BELLARY DIST.
KARNATAKA STATE

Telex: 0817-221 / 0845-8634 TML IN
Grams: AGGREGATES, SANDUR.
Phone: 3786 / 452 / 8152 TORANAGALLU

TMR/ 364 /93-94 23rd 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 TUNGABHADRA MINERALS LTD.,

ASST. ADMINISTRATIVE OFFICER.

TELEX: 196-252 TPL IN

TEL. ADD.: TIMBLO MARGAO

TIMBLO PRIVATE LIMITED

Registered Office
KADAR MANZIL
MARGAO - GOA
403 601

PHONE: 27165 (5 LINES)

POST BOX NO. 36

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

PRINCIPAL
S.K.S. Arts Science & Commerce College
SANDUR-583 119.

Vijayanagara Srikrishnadevaraya University, Ballari
Director, Post Graduate Centre, Nandihalli-sandur
Ph. No(Off) : 08395-278235
: 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, Baliari, 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 Srikrishnadeva aya University
PG Centre, Nandihalli-Sandur

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯ

Gulbarga University

ಗುಲಬರ್ಗಾ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಸೆನೆಟ್‌ನ ಕುಲಪತಿ, ಉಪಕುಲಪತಿ ಮತ್ತು ಸದಸ್ಯರಾದ ನಾವು

ಬಜಾರ್ ವಾಜಿ ರಾಜೇಂದ್ರಾಚಾರ್

ಇವರು ಮಾನ್ಯತೆ ಅಥ್ ಮಾಯಿನ್ಸ್ (ಖನಿಜ ಪರಿಶೋಧನೆ) ಪದವಿ ಪರೀಕ್ಷೆಯಲ್ಲಿ ಮೇ ೧೯೮೮ ರಲ್ಲಿ ಪ್ರಥಮ ದರ್ಜೆಯಲ್ಲಿ ಉತ್ತೀರ್ಣರಾಗಿರುವುದಾಗಿ ಪರೀಕ್ಷಕರು ಅಭಿಪ್ರಾಯಪಟ್ಟಿರುವುದರಿಂದ

ಮಾಸ್ಟರ್ ಆಫ್ ಸೈನ್ಸ್
(ಖನಿಜ ಪರಿಶೋಧನೆ)

ಪದವಿಯನ್ನು ಗುಲಬರ್ಗಾದಲ್ಲಿ ಜರುಗಿದ ಎರಡನೆಯ ಘಟಿಕೋತ್ಸವದಲ್ಲಿ ಈ ವಿಶ್ವವಿದ್ಯಾಲಯದ ಮುದ್ರೆ ಮತ್ತು ಕುಲಪತಿಗಳ ಮುದ್ರೆಯೊಂದಿಗೆ ಇವರಿಗೆ ಪ್ರದಾನಿಸಲಾಗಿದೆ.

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

Registrar
Gulbarga
Serial : ೪೭-೨-೦೧೮೮
Dated : 26.2.1989

Vice-Chancellor

SRIPAD PUJAR
QUALIFIED PERSON

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 ड्राईव 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) : 08395-278286
: 08395-278226
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 Vajirajendrachar 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 Srikrishnadeva ... University
PG. Centre, Nandihalli-Sandur

ANNEXURE - 7

Indian Bureau of Mines

GOVERNMENT OF KARNATAKA

No.DMG/ MLS/CCA/12/2017-18

Office of the Director
Department of Mines and Geology
KhanijaBhavan, Race Course Road
Bangalore-1, dated: 01.03.2018

DGPS Co-ordinates of M/s Bharath Mines and Minerals (M.L. No.-2245)

In pursuance to the NIT dated: 30.01.2018, read the following DGPS co-ordinates at Sl. No. 1 (Latitude, Longitude of Corner Points as per DGPS) of the summary of mine block in respect of M/s Bharath Mines and Minerals (M.L. No.-2245).

SL. NO.	PILLAR ID	LATITUDE	LONGITUDE
		dd - mm - ss	dd - mm - ss
1	BLR-09	N15°01'46.93700"	E76°34'38.49700"
2	LBS-A	N15°01'43.84657"	E76°35'25.62412"
3	LBS-B	N15°01'54.22593"	E76°35'21.37669"
4	LBS-C	N15°01'55.32583"	E76°35'24.80892"
5	LBS-D	N15°01'51.75250"	E76°35'26.60598"
6	LBS-E	N15°01'53.95940"	E76°35'32.05997"
7	LBS-F	N15°01'58.34472"	E76°35'32.97602"
8	LBS-G	N15°02'03.69878"	E76°35'22.30861"
9	LBS-H	N15°02'05.14264"	E76°35'25.34458"
10	LBS-I	N15°02'03.03593"	E76°35'30.97060"
11	LBS-J	N15°02'05.72812"	E76°35'37.45262"
12	LBS-K	N15°02'07.18386"	E76°35'29.51739"
13	LBS-L	N15°02'11.39010"	E76°35'38.33528"
14	LBS-M	N15°01'53.16930"	E76°35'45.54410"
15	LBS-N	N15°01'52.64912"	E76°35'44.32019"
16	LBS-O	N15°01'54.28842"	E76°35'41.05733"
17	LBS-P	N15°01'49.33657"	E76°35'31.05125"
18	LBS-Q	N15°01'45.68789"	E76°35'29.67496"

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

Reserves / Resources Estimation at 45% Fe cutoff

S.No.	BH. No.	Intersection (m)		Diff. (m)	True Width (m)	Average sectional influence (m)	Area (Sq. m)	Area (Sq. m)	Area (Sq. m)	Reserves (Tonnes)			Total Reserves (Tonnes)	Grade (%)		
		From	To				G-1	G-2	G-3	G-1	G-2	G-3		Fe	SiO_2	Al_2O_3
S-2	MBMR-4	0.00	9.00	9.00	7.74	88.30	144.3194			44264.7201			44264.7201	48.76	5.81	9.67
		30.00	35.00	5.00	4.30	88.30	452.1314			138674.8412			138674.8412	49.91	9.42	10.48
	MBMR-7	13.00	18.00	5.00	4.30	88.30	811.0984			248774.8956			248774.8956	53.19	11.47	1.92
	MBM-18	0.00	26.90	26.90	23.13	88.30	1796.3023			550950.3128			550950.3128	57.90	11.43	3.75
S-2a	MBMR-12	0.00	18.00	18.00	15.48	48.60	1716.1997	1002.0451		289718.6117	169159.2856		458877.8973	49.78	6.76	10.19
S-3	MBMR-17	0.00	15.30	15.30	13.16	60.80	788.5394	650.4121		166532.6074	137361.3327		303893.9401	49.26	1.66	10.61
		31.80	40.80	9.00	7.74	60.80	726.9339	670.7554		153522.0659	141657.6593		295179.7252	46.18	0.83	12.53
		53.00	56.70	3.70	3.18	60.86	478.5192	529.8493		101059.0594	111899.5264		212958.5858	55.71	2.81	6.47
	MBMR-8	0.00	8.00	8.00	6.88	60.80	902.1123	535.9654		190518.2080	113191.1931		303709.4012	60.98	8.14	3.31
S-4	MBMR-11	0.00	76.00	76.00	65.36	69.15	6143.9323	3958.4913	2201.2155	1475743.6067	950810.9697	528721.5976	2955276.1740	50.86	10.05	10.13
	MBMR-19	0.00	19.65	19.65	16.90	69.15	2683.6794	965.7614		644607.1544	231971.3405		876578.4949	49.13	24.80	2.61
	MBMR-10	13.00	43.00	30.00	25.80	69.15	2227.4636	1616.4198	791.5302	535026.2676	388256.4242	190121.8267	1113404.5186	50.53	17.44	2.65
S-4a	MBMR-15	0.00	15.00	15.00	12.90	50.15	1663.9829	1226.4851		289862.5448	213651.2895		503513.8343	62.28	4.24	3.53
S-5	MBMR-14	9.00	15.00	6.00	5.16	81.45	466.0702	473.0109		131860.5032	133824.1648		265684.6680	49.82	20.15	4.35
	MBMR-16	0.00	31.85	31.85	27.39	81.45	2624.7703	1145.4804		742599.5749	324079.1235		1066678.6984	52.41	10.30	8.55
S-6	MBMR-9	0.00	9.00	9.00	7.74	75.00	946.7997	302.4244		246655.9972	52734.6938		299390.6910	48.39	10.65	8.93
										Total in-situ Reserves			9637811.3095			
										Net Reserves (Tonnes)			8674030.2786			
										After application of Correction factor			7573288.258	52.19	9.74	10.35
										Net Reserves (Million Tonnes)			7.577			

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

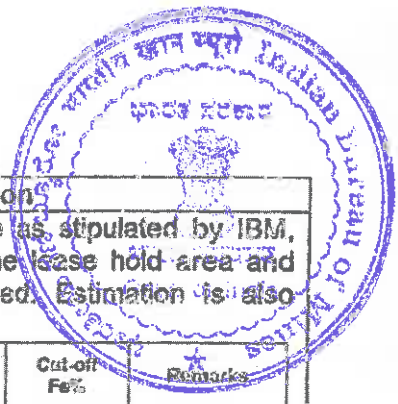
Bureau of Mines

ANNEXURE - 8

PART –IV A
REPORTING OF MINERAL RESOURCES

Sl.no	Contents	Explanation
1	Title & Ownership	M/s BHARAT MINES & MINERALS LIMITED (ML No.2245), KUMARASWAMY RANGE, SANDUR SCHIST BELT,DISTRICT: BALLARI, KARNATAKA, GOVT. OF KARNATKA Period of prospecting: 02.03.2016 to 18.03. 2016 Analysis completed on 23.06.2016.
2	Details of the area	Longitudes 76°35'21.4" and 76°35'45.4" and Latitudes 15°01'44.0" and 15°02'11.3". The block falls in Dharampur village of Kumaraswamy range. The block is covered in Survey of India Topo sheet No.57 A/12. Lease area is 24.47 Hectares.
3	Infrastructure and environment	The mine lease area is 20 km from Sandur town which can be approached from Bellary, Hospet, Donimalai and from Toranagallu railway station.
4	Previous Exploration	Nil; while the mine area has been exploited for iron ore
5	Geology	The Sandur Schist Belt is known for its economic deposits of iron and Manganese and studied in detail by many prominent workers like New Bold (1838), Foote (1895), Roy and Biswas(1983), Martin and Mukhopadhyay (1987 & 1993), Naqvi et.al. (1987) on various aspects like depositional environment, structure etc. Iron ore, banded ferruginous cherty quartzite, are intimately associated with gabbro of pre-tectonic and post tectonic origin. The hill ranges trend in NNW-SSE direction, which are similar to regional tectonic trend of the Sandur Schist Belt. The area has under gone two phases of deformation [F1 and F2] and metamorphism. The axial trace of F1 have NNW-SSE trend which is refolded by open F2 folds trending in ENW-WSE direction. The primary structure of banded iron ore formation is bedding and pene-contemporaneous faults; schistosity and fracture cleavage are also common. Repetitions of iron ore bands, which cause the thickening of ore at places, are due to diestrophic folds.
6	Aerial/Ground geophysical /Geochemical data	–
7	Technological Investigation	Exploratory drilling at 100m x 100m (G1, G2 and G3 level of UNFC)
8	Location of data points	Provided in the topographical and geological map on 1:1000 scale

Sl.no	Contents	Explanation
9	Sampling techniques	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, SiO_2 and Al_2O_3 analyses, whereas the third packet has preserved for future reference. 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 garm 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, SiO_2 and Al_2O_3 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. Total no. of primary samples analysed is 1113. Check samples – 61 nos.
10	Drilling Technique and drill sampling employed	Exploratory core drilling - 189.80m (4 BHs) RC Drilling - 691.00m (15BHs) Total Drilling - 880.80m (19 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 MECL, Chemical Laboratory, Utilities Complex, Nagpur by XRF method.
13	Moisture	-
14	Bulk Density	The specific gravity was determined on 5 no. of samples at Lab. and for computation of reserves, the factor 3.50 has been considered.
15	Resource estimation techniques	Reserves 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



<table>
<tr><th>Sl.no</th><th>Contents</th><th>Explanation</th></tr>
<tr><td></td><td></td><td>At threshold cutoff of 45% Fe as stipulated by IBM, the mineralized zone within the lease hold area and the ore reserves are estimated. Estimation is also been made at 55% Fe cut-off
<table>
<tr><th>Strike length (m)</th><th>Average thick (m)</th><th>Net Reserves (M.T)</th><th>Grade Fe%</th><th>Cut-off Fe%</th><th>Remarks</th></tr>
<tr><td>473.45</td><td>32.46</td><td>7.577</td><td>52.19</td><td>45</td><td></td></tr>
<tr><td>317.00</td><td>12.17</td><td>2.917</td><td>59.18</td><td>55</td><td></td></tr>
<tr><td>585.00</td><td>41.04</td><td>17.024</td><td>42.18</td><td>35</td><td></td></tr>
</table>
Raw assay data and zone data have been subjected for statistical studies to derive various parameters including sichel's 't' estimator.</td></tr>
<tr><td>16</td><td>Further work</td><td>An approximately 19.06 ha falling in north-eastern side and south-eastern side of the block could also be assessed for resource estimation by exploratory drilling of 8 boreholes. This would eventually augment the ore reserves, so that, it is prudent to auction the mine as single block in the interest of scientific mining. (After joint inspection report) dtd.25.02.2016 of office of the commissioner, DMG-Karnataka, Bangalore. No.DMG/MLS/MECL/2015-16.</td></tr>
<tr><td>17</td><td>Annexure/enclosures to the report</td><td>MECL reports includes all the relevant maps, sections, logs, analytical reports & fields photos</td></tr>
<tr><td>18</td><td>Any other information</td><td>Though the ore zone thickness is quite appreciable and impressive at 45% Fe cut-off, an attempt has also been made to evaluate the ore resources at a planning cut-off of 35% Fe. The mineralized zone has been persistent over the entire strike length of 585.00m along the wide area of 125m - 230m with an average thickness of 31.04m and the ore resources estimated is 17.024 million tonnes with the grade of 42.18 % Fe, 19.38% SiO_2 and 9.83% Al_2O_3.</td></tr>
</table>

CERTIFICATE

This is to certify that the details exploration for iron ore has been carried out in M/s Bharat Mines & Minerals Limited (ML No.2245), district Ballari, Karnataka by Mineral Exploration Corporation Limited (MECL) on behalf of Department of Mines & Geology (DMG), Karnataka. The exploration has been done upto G1 and G2 level of UNFC and the report has been prepared in accordance with the Minerals (Evidence of Mineral Contents) Rule 2015 specified under Mineral Auction Rule, 2015. The duly filled in format Part-IV-A of the report as per MEMC Rule is attached herewith.

(Signature)
Mineral Exploration Corporation Limited
(CPSE under Ministry of Mines, Govt. of India
Nagpur, Maharashtra

ANNEXURE-9a

YEARWISE PRODUCTION & DEVELOPMENT PROGRAM (Bench & Section wise)

1st YEAR

				IRON ORE						SILICEOUS IRON ORE						WASTE					
Sec-tions	No. of Benches	Level (mRL) Top	Bottom	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Total Waste*
S2-S2'	4	970	963	0	60	0	3.0	0	0	35	60	2100	2.8	5880	5292	0	60	0	2.0	0	420
		963	956	0	60	0	3.0	0	0	42	60	2520	2.8	7056	6350	0	60	0	2.0	0	504
		956	949	61	60	3660	3.0	10980	9882	0	60	0	2.8	0	0	0	60	0	2.0	0	732
		949	942	96	60	5760	3.0	17280	15552	0	60	0	2.8	0	0	0	60	0	2.0	0	1152
sub-total						***9420***		***28260***	***25434***			***4620***		***12936***	***11642***			***0***		***0***	***2808***
S2a-S2a'	3	963	956	20	50	1000	3.0	3000	2700	35	50	1750	2.8	4900	4410	0	50	0	2.0	0	550
		956	949	24	50	1200	3.0	3600	3240	102	50	5100	2.8	14280	12852	0	50	0	2.0	0	1260
		949	942	190	50	9500	3.0	28500	25650	21	50	1050	2.8	2940	2646	0	50	0	2.0	0	2110
sub-total						***11700***		***35100***	***31590***			***7900***		***22120***	***19908***			***0***		***0***	***3920***
S3-S3''	3	963	956	30	60	1800	3.0	5400	4860	0	60	0	2.8	0	0	0	60	0	2.0	0	360
		956	949	60	60	3600	3.0	10800	9720	0	60	0	2.8	0	0	0	60	0	2.0	0	720
		949	942	83	60	4980	3.0	14940	13446	0	60	0	2.8	0	0	0	60	0	2.0	0	996
sub-total						***10380***		***31140***	***28026***			***0***		***0***	***0***			***0***		***0***	***2076***
S4a-S4a'	4	970	963	0	30	0	3.0	0	0	0	30	0	2.8	0	0	0	30	0	2.0	0	0
		963	956	11	30	330	3.0	990	891	0	30	0	2.8	0	0	0	30	0	2.0	0	66
		956	949	46	30	1380	3.0	4140	3726	0	30	0	2.8	0	0	0	30	0	2.0	0	276
		949	942	33	30	990	3.0	2970	2673	0	30	0	2.8	0	0	0	30	0	2.0	0	198
sub-total						***2700***		***8100***	***7290***			***0***		***0***	***0***			***0***		***0***	***540***
Grand Total						***34200***			***92340***			***12520***			***31550***			***0***		***0***	***9344***

2nd YEAR

				IRON ORE						SILICEOUS IRON ORE						WASTE					
Sec-tions	No. of Benches	Level (mRL) Top	Bottom	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Total Waste
S2-S2'	6	984	977	43	60	2580	3.0	7740	6966	0	60	0	2.8	0	0	0	60	0	2.0	0	516
		977	970	47	60	2820	3.0	8460	7614	23	60	1380	2.8	3864	3478	0	60	0	2.0	0	840
		970	963	0	60	0	3.0	0	0	40	60	2400	2.8	6720	6048	0	60	0	2.0	0	480
		963	956	0	60	0	3.0	0	0	55	60	3300	2.8	9240	8316	0	60	0	2.0	0	660
		956	949	75	60	4500	3.0	13500	12150	30	60	1800	2.8	5040	4536	0	60	0	2.0	0	1260
		949	942	100	60	6000	3.0	18000	16200	0	60	0	2.8	0	0	0	60	0	2.0	0	1200
sub-total						***15900***		***47700***	***42930***			***8880***		***24864***	***22378***			***0***		***0***	***4956***
S2a-S2a'	3	963	956	57	50	2850	3.0	8550	7695	0	50	0	2.8	0	0	0	50	0	2.0	0	570
		956	949	38	50	1900	3.0	5700	5130	15	50	750	2.8	2100	1890	0	50	0	2.0	0	530
		949	942	43	50	2150	3.0	6450	5805	6	50	300	2.8	840	756	0	50	0	2.0	0	490
sub-total						***6900***		***20700***	***18630***			***1050***		***2940***	***2646***			***0***		***0***	***1590***
S3-S3'	3	963	956	24	60	1440	3.0	4320	3888	32	60	1920	2.8	5376	4838	0	60	0	2.0	0	672
		956	949	41	60	2460	3.0	7380	6642	0	60	0	2.8	0	0	0	60	0	2.0	0	492
		949	942	48	60	2880	3.0	8640	7776	0	60	0	2.8	0	0	0	60	0	2.0	0	576
sub-total						***6780***		***20340***	***18306***			***1920***		***5376***	***4838***			***0***		***0***	***1740***
S4a-S4a'	4	970	963	38	30	1140	3.0	3420	3078	0	30	0	2.8	0	0	0	30	0	2.0	0	228
		963	956	27	30	810	3.0	2430	2187	0	30	0	2.8	0	0	0	30	0	2.0	0	162
		956	949	53	30	1590	3.0	4770	4293	0	30	0	2.8	0	0	0	30	0	2.0	0	318
		949	942	57	30	1710	3.0	5130	4617	0	30	0	2.8	0	0	5	30	150	2.0	300	642
sub-total						***5250***		***15750***	***14175***			***0***		***0***	***0***			***150***		***300***	***1350***
Grand Total						***34830***			***94041***			***11850***			***29862***			***150***		***300***	***9636***

**Note-Total waste includes 10% intercalated waste in ore zone*

SRIPAD PUJAR
QUALIFIED PERSON

S.V.R. ACHAR
QUALIFIED PERSON

ANNEXURE - 9a

ANNEXURE-9b

YEARWISE PRODUCTION & DEVELOPMENT PROGRAM (Bench & Section wise)

3rd YEAR

				IRON ORE						SILICEOUS IRON ORE						WASTE					
Sec-tions	No. of Benches	Level (mRL) Top	Bottom	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Total Waste*
S2-S2'	3	956	949	8	60	480	3.0	1440	1296	0	60	0	2.8	0	0	0	60	0	2.0	0	96
		949	942	41	60	2460	3.0	7380	6642	0	60	0	2.8	0	0	0	60	0	2.0	0	492
		942	935	251	60	15060	3.0	45180	40662	0	60	0	2.8	0	0	0	60	0	2.0	0	3012
sub-total						*18000*		*54000*	*48600*			*0*		*0*	*0*			*0*		*0*	*3600*
S2a-S2a'	1 each	942	935	260	50	13000	3.0	39000	35100	0	50	0	2.8	0	0	0	50	0	2.0	0	2600
S3-S3'		942	935	212	60	12720	3.0	38160	34344	0	60	0	2.8	0	0	0	60	0	2.0	0	2544
S4-S4'		942	935	15	70	1050	3.0	3150	2835	0	70	0	2.8	0	0	0	70	0	2.0	0	210
S4a-S4a'		942	935	38	30	1140	3.0	3420	3078	0	30	0	2.8	0	0	0	30	0	2.0	0	228
Grand Total						*45910*			*123957*			*0*			*0*			*0*		*0*	*9182*

4th YEAR

				IRON ORE						SILICEOUS IRON ORE						WASTE					
Sec-tions	No. of Benches	Level (mRL) Top	Bottom	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Total Waste
S2-S2'	5	963	956	8	60	480	3.0	1440	1296	0	60	0	2.8	0	0	15	60	900	2.0	1800	1896
		956	949	52	60	3120	3.0	9360	8424	0	60	0	2.8	0	0	0	60	0	2.0	0	624
		949	942	65	60	3900	3.0	11700	10530	0	60	0	2.8	0	0	0	60	0	2.0	0	780
		942	935	58	60	3480	3.0	10440	9396	0	60	0	2.8	0	0	0	60	0	2.0	0	696
		935	928	155	60	9300	3.0	27900	25110	0	60	0	2.8	0	0	0	60	0	2.0	0	1860
sub-total						*20280-*		*60840*	*54756*			*0*		*0*	*0*			*900*		*0*	*5856*
S2a-S2a'	3	949	942	26	50	1300	3.0	3900	3510	0	50	0	2.8	0	0	5	50	250	2.0	500	760
		942	935	54	50	2700	3.0	8100	7290	0	50	0	2.8	0	0	0	50	0	2.0	0	540
		935	928	115	50	5750	3.0	17250	15525	0	50	0	2.8	0	0	0	50	0	2.0	0	1150
sub-total						*9750*		*29250*	*26325*			*0*		*0*	*0*			*250*		*500*	*2450*
S3-S3'	3	949	942	0	60	0	3.0	0	0	0	60	0	2.8	0	0	13	60	780	2.0	1560	1560
		942	935	65	60	3900	3.0	11700	10530	0	60	0	2.8	0	0	27	60	1620	2.0	3240	4020
		935	928	100	60	6000	3.0	18000	16200	0	60	0	2.8	0	0	0	60	0	2.0	0	1200
sub-total						*9900*		*29700*	*26730*			*0*		*0*	*0*			*2100*		*4800*	*6780*
S4-S4'	1	935	928	85	70	5950	3.0	17850	16065	0	70	0	2.8	0	0	0	70	0	2.0	0	1190
sub-total						*5950*		*17850*	*16065*			*0*		*0*	*0*			*0*		*0*	*1190*
Grand Total						*45880*			*123876*			*0*			*0*			*3550*		*5300*	*16276*

**Note-Total waste includes 10% intercalated waste in ore zone*

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

ANNEXURE-9/b

ANNEXURE-9c

YEARWISE PRODUCTION & DEVELOPMENT PROGRAM (Bench & Section wise)

5th YEAR

				IRON ORE						SILICEOUS IRON ORE						WASTE					
Sec-tions	No. of Benches	Level (mRL) Top	Bottom	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Recovery 90%	Area sqm	Influ Mtr	Volu Cum	BD t/cum	Quantity tonnes	Total Waste
S2-S2'	7	977	970	0	60	0	3.0	0	0	0	60	0	2.8	0	0	28	60	1680	2.0	3360	3360
		970	963	0	60	0	3.0	0	0	0	60	0	2.8	0	0	19	60	1140	2.0	2280	2280
		963	956	0	60	0	3.0	0	0	0	60	0	2.8	0	0	49	60	2940	2.0	5880	5880
		956	949	48	60	2880	3.0	8640	7776	0	60	0	2.8	0	0	0	60	0	2.0	0	576
		949	942	49	60	2940	3.0	8820	7938	0	60	0	2.8	0	0	0	60	0	2.0	0	588
		942	935	49	60	2940	3.0	8820	7938	0	60	0	2.8	0	0	0	60	0	2.0	0	588
		935	928	188	60	11280	3.0	33840	30456	0	60	0	2.8	0	0	0	60	0	2.0	0	2256
sub-total						*20040*		*60120*	*54108*			*0*		*0*	*0*			*5760*		*0*	*15528*
S2a-S2a'	9	991	984	0	50	0	3.0	0	0	0	50	0	2.8	0	0	40	50	2000	2.0	4000	4000
		984	977	0	50	0	3.0	0	0	0	50	0	2.8	0	0	42	50	2100	2.0	4200	4200
		977	970	0	50	0	3.0	0	0	0	50	0	2.8	0	0	38	50	1900	2.0	3800	3800
		970	963	0	50	0	3.0	0	0	0	50	0	2.8	0	0	40	50	2000	2.0	4000	4000
		963	956	0	50	0	3.0	0	0	0	50	0	2.8	0	0	46	50	2300	2.0	4600	4600
		956	949	0	50	0	3.0	0	0	0	50	0	2.8	0	0	34	50	1700	2.0	3400	3400
		949	942	0	50	0	3.0	0	0	0	50	0	2.8	0	0	40	50	2000	2.0	4000	4000
		942	935	57	50	2850	3.0	8550	7695	0	50	0	2.8	0	0	0	50	0	2.0	0	570
		935	928	149	50	7450	3.0	22350	20115	0	50	0	2.8	0	0	0	50	0	2.0	0	1490
sub-total						*10300*		*30900*	*27810*			*0*		*0*	*0*			*14000*		*7400*	*30060*
S3-S3'	8	984	977	0	60	0	3.0	0	0	0	60	0	2.8	0	0	30	60	1800	2.0	3600	3600
		977	970	0	60	0	3.0	0	0	0	60	0	2.8	0	0	40	60	2400	2.0	4800	4800
		970	963	0	60	0	3.0	0	0	0	60	0	2.8	0	0	43	60	2580	2.0	5160	5160
		963	956	0	60	0	3.0	0	0	0	60	0	2.8	0	0	40	60	2400	2.0	4800	4800
		956	949	0	60	0	3.0	0	0	0	60	0	2.8	0	0	48	60	2880	2.0	5760	5760
		949	942	0	60	0	3.0	0	0	0	60	0	2.8	0	0	48	60	2880	2.0	5760	5760
		942	935	0	60	0	3.0	0	0	0	60	0	2.8	0	0	48	60	2880	2.0	5760	5760
		935	928	154	60	9240	3.0	27720	24948	0	60	0	2.8	0	0	0	60	0	2.0	0	1848
sub-total						*9240*		*27720*	*24948*			*0*		*0*	*0*			*17280*		*17280*	*37488*
S4-S4'	3	949	942	0	70	0	3.0	0	0	0	70	0	2.8	0	0	16	70	1120	2.0	2240	2240
		942	935	0	70	0	3.0	0	0	0	70	0	2.8	0	0	20	70	1400	2.0	2800	2800
		935	928	90	70	6300	3.0	18900	17010	0	70	0	2.8	0	0	19	70	1330	2.0	2660	3920
sub-total						*6300*		*18900*	*17010*			*0*		*0*	*0*			*3850*		*7700*	*8960*
Grand Total						*45880*			*123876*			*0*			*0*			*41430*		*32380*	*92036*

**Note-Total waste includes 10% intercalated waste in ore zone*

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

ANNEXURE-9/c

ANNEXURE - 1D

State Level Environment Impact Assessment Authority-Karnataka

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

No. SEIAA 12 MIN 2007 Date: 31-01-2019

TRANSFER OF ENVIRONMENTAL CLEARANCE

Preamble:

Attention is invited to the Environment Clearance Letter No. SEIAA 12 MIN 2007 dated 9th October 2009 regarding grant of Environmental Clearance to M/s. Bharat Mines and Minerals for undertaking mining of iron ore production (M.L.No. 2245) in Nandihalli Village, Sandur Taluk, Bellary District.

The Department of Mines and Geology vide letter No.DMG/MLS/AUC/'C'-2245/2018-19 Dated: 06-10-2018 has issued letter of intent from "M/s. Bharat Mines and Minerals, ML No: 2245" Block for iron ore in Nandihalli Village, Sandur Taluk, Bellary District of 24.47 Hectare Area Forest Land 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 06-10-2018 as the "preferred bidder" for the "C category" of mine – M/s. Bharat Mines and Minerals in an e-auction process to transfer the EC granted to M/s. Bharat Mines and Minerals vide E.C. letter No. SEIAA 12 MIN 2007 dated 9th October 2009 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 SEIAA 12 MIN 2007 dated 9th October 2009 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 SEIAA 12 MIN 2007 dated 9th October 2009.

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.

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

Room No. 706, 7th Floor, 4th Gate, M.S. Building, Bangalore - 560 001 Phone : 080-22032497 Fax: 080-22254377
Website : http://seiaa.kar.nic.in http://seiaa.karnataka.gov.in http://environmentclearance.nic.in
e-mail: msseiaakarnataka@gmail.com

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. Bharat Mines & Minerals, "Singhi Sadan", Infantry Road, Cantonment, Bellary-583 104 Karnataka by the State Level Environment Impact Assessment Authority, Karnataka vide letter No. SEIAA 12 MIN 2007 dated 9th October 2009 for Iron Ore Mines at Nandhihalli Village, Sandur Taluk, Bellary 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 SEIAA 12 MIN 2007 dated 9th October 2009.
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.

(N.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. Bharat Mines & Minerals, "Singhi Sadan", Infantry Road, Cantonment, Bellary-583 104 Karnataka.
(6) Guard File.

ANNEXURE - II

No.8-63/2000-FC (376(F)
Government of India
Ministry of Environment and Forests
F.C. Division

Paryavaran Bhawan,
CGO Complex, Lodhi Road,
New Delhi - 110 003.
Dated: 20 .3.2001

To,
The Secretary (Forests)
Govt. of Karnataka
Bangalore

Sub: Renewal of mining lease No. 2245 in favour of M/s Bharat Mines & Minerals over 37.225 hectare of forest land in Bellary District

Sir,

I am directed to refer to your letters No.FEE 32 FFM 2000 dated 24.6.2000, 14.8.2000 and 24.10.2000 on the above mentioned subject seeking prior approval of the Central Govt. in accordance with Section-2 of Forest (Conservation) Act, 1980 and to say that the proposal has been examined by the Advisory Committee constituted by the Central Government under Section 3 of the aforesaid Act.

2. After careful consideration of the proposal of the State Government and on the basis of the recommendation of the above mentioned Advisory Committee, the Central Government hereby conveys its approval under Section-2 of the Forest (Conservation) Act ,1980 for renewal of mining lease No. 2245 in favour of M/s Bharat Mines & Minerals over 26.20 hectare of forest land in Bellary District i.e. the forest land which was granted approval earlier under Forest (Conservation) Act, 1980 in 1997 and has since been totally broken up subject to following conditions:-

a Legal status of forest land shall remain unchanged.
b. Lease period shall be for 20 years w.e.f. 6.4.2001.
c. The user agency will be allowed use of 0.30 ha. forest land (road) which is the only route to access the mining lease area subject to condition that the user agency gives a commitment to maintain the road.
d. Phased reclamation plan will be implemented by the user agency at their cost.
e. The forest land shall not be used for any purpose other than that specified in the proposal.
f. Fencing, protection and regeneration of the safety zone area will be done at the project cost. Besides this, afforestation over one and a half times of safety zone area in degraded forest elsewhere will be done at the project cost.
g Demarcation of mining lease area will be done on the ground using four feet high, reinforced cement concrete pillars with serial numbers, forward & back bearings and distance from pillar to pillar at project cost.

SRIPAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

h. The approval under the Forest (Conservation) Act, 1980 is subject to the clearance under the Environmental Protection Act, 1986, if required.

i. Any other condition that the State Govt. or the Chief Conservator of Forests (Central), Regional Office, Bangalore may impose from time to in the interest of conservation, protection or development of forests.

Yours faithfully,

(R. K. GUPTA)
Asst. Inspector General of Forests

Copy to,

1. The Principal Chief Conservator of Forests, Government of Karnataka, Bangalore.
2. The Nodal Officer, Office of the Principal Chief Conservator of Forests, Government of Karnataka, Bangalore.
3. The Chief Conservator of Forest (Central) , Regional Office, Bangalore.
4. RO(HQ), New Delhi
5. M/s Bharat Mines & Minerals, Pannaraja Compound, Fort, Bellary-583102, Karnataka.
6. Guard file.

20.3.2001

(R. K. GUPTA)
Asst. Inspector General of Forests

8-63/2000-FC

PROCEEDINGS OF THE GOVERNMENT OF KARNATAKA

Sub:- Renewal of mining lease No.2245 in favour of M/s. Bharath Mines and Minerals, Bellary for Iron Ore Mines over an area of 26.20 ha in Nandihally Village, Sandur Taluk, Bellary District.

- - -

READ:

1) Letter No.A5(B1)MNG.CR.1/2000-2001, dated 12-5-2000 of the Principal Chief Conservator of Forests, Bangalore
2) Letter No.A5(B1)MNG.CR.11/2000-2001, dated 11-7-2000 of the Principal Chief Conservator of Forests, Bangalore.
3) Letter No.A5(B1)MNG.CR.13/92-93, dated 19-8-2000 of the Principal Chief Conservator of Forests, Bangalore.
4) Letter No.A5(B1) MNG.CR.13/92-93(II), dated 20-10-2000 of the Principal Chief Conservator of Forests, Bangalore.
5) Letter No.A5(B1)MNG.CR.13/92-93, dated 3-1-2001 of the Principal Chief Conservator of Forests, Bangalore.
6) State Government letter Nof even number dated 24-6-2000, 14-8-2000, 30-8-2000, 19-9-2000, 24-10-2000 and 24-1-2001.
7) Government of India, Regional Office, Bangalore letter No.F(C)A/11.1/105/KAR/MIN dated 26-4-2000 and 5-10-2000.
8) Government of India letter No.8-63/2000, dated 24-8-2000 and 20-3-2001.

PREAMBLE:

The Principal Chief Conservator of Forests, Bangalore had sent proposal vide his letter dated 12-5-2000 read at (1) above for diversion of forest land over an area of 26.20 ha. in Nandihally Village of Sandur Taluk of Bellary District in favour of M/s. Bharat Mines and Minerals, Bellary for a period of 10 years with effect from 6-4-2001, in accordance with Forest (Conservation) Act, 1980 subject to certain conditions.

The Proposal of Principal Chief Conservator of Forests was recommended to Government of India, Ministry of Environment and Forests, New Delhi vide letter of even number dated 24-6-2000 read at (6) above and its approval was sought under section (2) of the Forest (Conservation) Act, 1980 for the renewal of mining leage No.2245 Nandihally village, Sandur Taluk, Bellary District.

The Government of India, Regional Office, Bangalore vide its letter dated 26-4-2000 and 5-10-2000 read at (7) above had sought certain clarifications and additional information on the proposal. They were also sent through subsequent letter dated 30-8-2000 and 24-1-2001 read at (6) above.

The Principal Chief Conservator of Forests had again submitted proposal for the surrendered area of 13.86 hectare in Nandihally Village, S.M. Block, Sandur Taluk, Bellary District in favour of M/s. Bharat Mines and Minerals, Bellary under the

.....2.

Forest (Conservation) Act, 1980 with certain terms and conditions for a period of 10 years with effect from 7-4-200 This was also recommended to Government of India by Governme of Karnataka vide letter of even number dated 14-8-2000 read at (6) above.

The Principal Chief Conservator of Forests vide his letter dated 20-10-2000 and 3-1-2001 read at (4) and (5) respectively has informed Government that the User agency ha remitted a sum of Rs.4,13,700/- through D.D.No.202612 dated 26-9-2000 being penalty amount imposed for 2.10 ha. X 4 time Rs.49,250/- per hactare for having encroached the Forest are of 2.10 ha. outside the leased area. This report of the Principal Chief Conservator of Forests was forwarded to Government of India on 24-10-2000 by the State Government read at (6) above.

After careful consideration of the proposal of the State Government and on the recommendation of the Advisary Committee constituted by the Central Government under secti of the afore said Act. Government of India has conveyed it final approval under section 2 of the Forest (Conservation) Act, 1980 for renewal of mining lease No.2245 in favour of M/s.. Bharat Mines and Minerals over 26.20 ha. of forest lan in Bellary District i.e. the forest land which was granted approval earlier under Forest (Conservation) Act, 1980 in 1 subject to certain conditions.

GOVERNMENT ORDER NO.FEE 32 FFM 2000, BANGALORE, DATED:4-4-2001

After examining all aspects of the matter and inview of the approval accorded to the proposal by the Ministry of Environment and Forests, Government of India, New Delhi, Government are pleased to accord its approval (under section of the Forests Conservation Act, 1980) for the renewal of mining lease No.2245 in favour of M/s. Bharat Mines and Minerals, Bellary over an area of 26.20 hectare of forest land in Nandihally village of Sandur Taluk of Bellary District i.e. the forest land which was granted approval earlier under Forest (Conservation) Act, 1980 in 1997 and has since been totally broken up subject to following conditions:-

1. Legal status of forest land shall remain unchanged.
2. Lease period shall be for 20 years with effect from 6-4-2001.

...3.

(487)

3. The User agency will be allowed use of 0.30 ha. forest land (road) which is the only route to access the mining lease area subject to condition that the User agency gives a commitment to maintain the road.

4. Phased reclamation plan will be implemented by the User agency at their cost.

5. The forest land shall not be used for any purpose other than that specified in the proposal.

6. Fencing, protection and regeneration of the safety zone area will be done at the project cost. Besides this, afforestation over one and a half times of safety zone area in degraded forest elsewhere will be done at the project cost.

7. Demarcation of mining lease area will be done on the ground using four feet high reinforced ce concrete pillars with serial numbers, forward and back bearings and distance from pillar to pillar at project cost.

8. The approval under the Forest (Conservation) Act, 1980 is subject to the clearance under the Environmental protection Act, 1986, if required.

9. Any other condition that the State Government or the Chief Conservator of Forests (Central), Regional Office, Bangalore may impose from time to in the interest of conservation, protection or development of forests.

10. The lessee shall pay usual lease rent and supervision charges as prescribed by the Government from time to time.

11. The lessee shall open a firewood depot to supply firewood to the employees and labourers at the subsidised rates and the quantity to be prescribe the Deputy Conservator of Forests concerned.

12. The lessee shall undertake the afforestation measures in vacant area of the leased area.

13. The lessee shall carry out soil and water conservation measures and other necessary measures as advised by the Forest Department.

14. The lessee shall under take to protect rigidly the leased area and forest area surrounding the area upto one Km. from the leased area.

.....4.

15. The lessee shall not cut any trees without prior permission of the Forest Department and all produce of permitted fellings shall be handed over to Forest Department under cover of receipt.

16. The lessee shall abide by all the conditions prescribed by Government of India and Government of Karnataka.

17. The lessee shall execute an agreement with the Forest Department binding himself to abide by all usual conditions and terms as per orders of the Government as well as Principal Chief Conservator of Forests.

18. In case of violation of agreement condition of Forest Department shall have right to suspend the mining activities.

19. The lessee shall take-up the planting work on the static dumps during the advance mining operations.

BY ORDER AND IN THE NAME OF THE GOVERNOR OF KARNATAKA,

(K.T. VIJAYARAJ URS)
Under Secretary to Governmer
Forest, Environment & Ecology De

To

The Compiler, State Gazettee with a request to publish the government order and to send 50 copies to the Government and also to the Principal Chief Conservato of Forests and others.

Copy to:

1. Accountant General (Audit and Accounts), Karnataka, Bang
2. The Secretary to Government of India, Ministry of Environ and Forests, C.G.O.Complex, Lodhi Road, New Delhi.
3. The Chief Conservator of Forests(C), Regional Office, Southern Zone, Kendriya Sadana, II Block, 4th Floor, C & F Wing, 17th Main, Koramangala, Bangalore.
4. The Principal Secretary to Government, Commerce and Industries Department.
5. The Secretary to Government-II, Commerce and Industries
6. Principal Chief Conservator of Forests, Aranya Bhavan, Bangalore.
7. The Director, Mines and Geology Department, Bangalore.
8. The Chairman, Karnataka State Pollution Control Board, B
9. The Conservator of Forests, Bellary Circle, Bellary.
10. The Deputy Conservator of Forests, Bellary.
11. The Deputy Commissioner, Chitradurga.
12. The Deputy Conservator of Forests, Bellary Division, Bel
13. The Jnder Secretary to Government, Forest, Environment an Ecology Department (E & F)
14. M/s. Bharat Mines and Minerals, Bellary District (Pannar Compound, Fort, Bellary-583102.
15. Spare copies/ Section Guard File.

s.4

FEASIBILITY STUDY REPORT

1. General Mine description.

M/s Bharath Mines & Minerals Limited (ML No.2245) mine lease block in Sandur Taluka, Bellary District Over an extent of 24.47 Ha area of Forest Land of Kumarswamy range (Devadarigudda) 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 4 nos. of Core drill holes (189.80m) and 15 nos. of RC drill holes (691m) during 2016. These Bore holes are marked in Geological Plan and borehole logs are enclosed in Annexure.

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

Resource/reserves were updated by cross sectional method considering the IBM threshold values (+45% Fe for Iron Ore, +35% Fe for Siliceous 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.

SHARAD PUJAR
QUALIFIED PERSON

B.V.R. ACHAR
QUALIFIED PERSON

Proved Mineral Reserves (111) are estimated based on G1 level of exploration data (drilling- 50mx100m grid). Proved ore is considered upto 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.

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 is classified as Inferred mineral resources (333).

Although MECL has considered Bulk Density as 3.5 tons/cum which is high. However, a Bulk density of 3.0 tons/cum is considered for iron ore and for Siliceous ore, it is 2.8 tons/cum based on the experience in the sector. BD for waste is 2.0 tons/cum. Field testing of Bulk Density will be carried out after the start of the mine operation. A recovery of 90% has been considered.

Summary of updated Reserves

Category	UNFC	Iron ore in tonnes			
		Normal	Siliceous	Total	Avg Grade
A. Total Mineral Reserves					
Proved Mineral Reserves	G1 -111	2,995,326	328,079	3,323,405	52.19%
Probable Mineral Reserves	G2- 121	81,000	-	81,000	
B. Total Remaining Resources					
Feasibility Mineral Resource	G1-211	1,094,445	68,040	1,162,485	
Prefeasibility Mineral	G2-221				
Measured Mineral Resource	G1- 331				
Indicated Mineral Resource	G2- 332				
Inferred Mineral Resource	G3- 333	2,880,927	-	2,880,927	
Total (A+B)		**7,051,698**	**396,119**	**7,447,817**	

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

Production capacity as per CEC approved production limit is 1.24 LTPA and same is proposed in this plan period.

Summary of production program

Year	Iron Ore In tonnes	Waste in tonnes	Ore to waste ratio
First	124,000	9,344	1:0.08
Second	124,000	9,636	1:0.08
Third	124,000	9,182	1:0.07
Fourth	124,000	16,276	1:0.13
Fifth	124,000	92,036	1:0.74

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

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 45^0 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 ton 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 sufficient machinery. The list of them is given below.

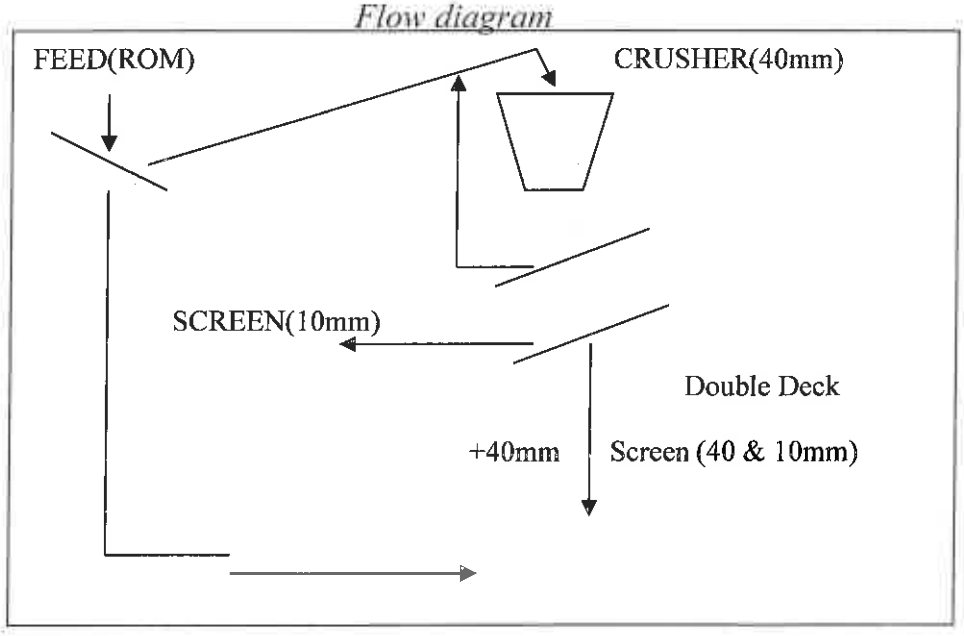
Type	Nos.	Size / Capacity
Wagon drill / Compressor	1	115mm
Excavator	2	0.9cum
Wheel Loader	1	1.0 cum
Tipper	5	16 tons
Jeep	1	5 Seat
Water Tanker	2	8000 Ltrs.
DG Set	1	33KVA
Crusher/Screening plants	1	100 TPH

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 then treated in the Screening Plant.

Flow diagram



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. Sandur-Narayanapura village road is passing at the NE side of the lease at a km away. Water for drinking and domestic purposes will be sourced from the Borewell from the nearby area. Ranjitpura (2km) is the nearest railway station and Marmugoa is the nearest port (400km). Donimalai township (3km) is having all facilities like Police outpost, Hospital, Post Office, School, Workshops etc.

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					

9. **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.

10. **Others like legal factors like tribal issues, national parks etc.**

Not applicable

11. **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 forseeble operating scenario.**

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

****