Scheme of Mining

1

Prepared under Rule 12 of M C D R 1988

(including Progressive Mine Closure Plan,

Prepared under Rule 23 B of MCDR, 1988)

of

Bhadigund Limestone Mine

M.L. No. 2560

Area: 40.12 Ha.

for the year 2013 – 14 to 2017 – 18

Type of land : Forest Land)

Category of Mine – "A" - FM

Situated in Bandigudda Village, Bhadravathy Taluk,

Shimoga District of Karnataka State.

Lessee:

M/s. SAIL – VISL - Bhadravathy.,

PREPARED BY	
KANTHARAJ. K.	K. T. RAMACHANDRA
RQP / GOA / 130 / 2000 / A	RQP/ BNG / 240 / 1900 / A

METAMORPHOSIS

BR. OFFICE & EN. & IND. RESEARCH LAB:
K S F BHAVAN, 1ST FLOOR, 4TH MAIN, 2ND CROSS, 2ND BLOCK,
KUVEMPU NAGAR, TUMKUR – 572 103.
TELEFAX : +91816 2270249.

HEAD OFFICE : # 143, 2ND FLOOR, 39TH MAIN, 4TH CROSS, 2ND STAGE,
B.T.M LAYOUT, BANGALORE – 560 068. PH : +9180 26783006.

स्टील अथारिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
विश्वेश्वरय्या आयरन एण्ड स्टील प्लान्ट
VISVESVARAYA IRON AND STEEL PLANT

TO WHOM IT MAY CONCERN:

AUTHORIZATION LETTER

This is to certify that, Sri K. Mahalingam, Dy. General Manager (Mines & Raw Materials) has been authorized to sign all the documents pertaining to Mining Plan / Scheme of Mining of Bhadigund Limestone Mines, over an extent of 40.12 Ha, being the M. L. No. 2560 situated in Bhandigudda village, Bhadravathi Taluk, Shimoga District of Karnataka state on behalf of Steel Authority of India Limited / Visvesvaraya Iron & Steel Plant, Bhadravathi.

V. G. SHANKER
Executive Director
SAIL / VISL

Date: 04/06/2012.

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
विश्वेश्वरैया आयरन एण्ड स्टील प्लान्ट
VISVESVARAYA IRON AND STEEL PLANT

AUTHORISATION LETTER

I K. MAHALINGAM Deputy General Manager (Mines & Raw Material) the undersigned, being the authorized person on behalf of the SAIL-VISL do hereby authorize the RQPs namely Mr. Kantharaj K and Mr. Ramachandra K T to prepare, submit and getting approval of Scheme of Mining from Indian Bureau of Mines in respect of our **Bhadigund** Limestone Mine of M/s. SAIL-VISL, which extends over an area of 49.12 Ha, bearing the M. L. No. **2660**, which is situated in Bhandigudda village, Bhadravathi Taluk of Shimoga District, Karnataka State.

DGM – Mines & RM
SAIL - VISL

DATE: 15/03/2013

PLACE : Bhadravathi

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
विश्वेश्वरैया आयरन एण्ड स्टील प्लान्ट
VISVESVARAYA IRON AND STEEL PLANT

CERTIFICATE OF UNDERTAKING

I undertake that I shall within a period of 180 (one hundred Eighty) days from the date of approval of Mining plan / Scheme of mining shall comply with the provision of Circular No. 2 / 2010 of chief controller of Mines, India Bureau of Mines, Nagpur issued vide letter No. 11013/3/MP/50 – CCOM VOL – VII dtd. 6.4.2010.

For Steel Authority of India Limited
Visvesvaraya Iron and Steel Plant

(K.MAHALINGAM)
Deputy General Manager (Mines & Raw mat.)

DATE: 15/03/2013

PLACE : Bhadravathi.

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
विश्वेश्वराया आयरन एण्ड स्टील प्लान्ट
VISVESVARAYA IRON AND STEEL PLANT

CERTIFICATE

This is to certify that the Scheme of Mining (including Progressive Mine Closure Plan) of **Bhadigund Limestone Mine** of M/s. SAIL, extends over an area of 40.12 Ha, being the M. L. No. **2660**, which is situated in Bhandigudda village, Bhadravathi Taluk of Shimoga District, Karnataka State, has been prepared in full consultation with me and I have understood its contents. I agree to implement the same in accordance with law.

For Steel Authority of India Limited
Visvesvaraya Iron and Steel Plant

(K.MAHALINGAM)
Deputy General Manager (Mines & Raw mat.)

DATE: 15/03/2013

PLACE : Bhadravathi

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
विश्वेश्वराया आयरन एण्ड स्टील प्लान्ट
VISVESVARAYA IRON AND STEEL PLANT

CERTIFICATE

This is to certify that the Progressive Mine Closure Plan of Bhadigund Limestone Mine of M/s. SAIL, extends over an area of 40.12 Ha, being the M. L. No. 2660, which is situated in Bhandigudda village, Bhadravathi Taluk of Shimoga District, Karnataka State complies all statutory rules, regulations, orders made by the Central or State Government, Statutory Organizations, Court etc., have been taken into consideration and wherever any specific permission is required the concerned authorities will be approached. And I also give an undertaking to the effect that all measures proposed in this closure plan will be implemented in a time bound manner.

For Steel Authority of India Limited
Visvesvaraya Iron and Steel Plant

(K.MAHALINGAM)
Deputy General Manager (Mines & Raw mat.)

DATE: 15/03/2013

PLACE : Bhadravathi.

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
विश्वेश्वरैया आयरन एण्ड स्टील प्लान्ट
VISVESVARAYA IRON AND STEEL PLANT

CERTIFICATE

This is to certify that, The provision of Mines Act 1952, Rules and Regulations made there under have been observed in the preparation of Scheme of Mining (including Progressive Mine Closure Plan) of Bhadigund Limestone Mine of M/s. SAIL, extends over an area of 40.12 Ha, being the M. L. No. 2660, which is situated in Bhandigudda village, Bhadravathi Taluk of Shimoga District, Karnataka State, Where specific permissions are required the applicant will approach Director General of Mines Safety, further. Standards prescribed by D G M S in respect of Miners Health will be strictly implemented..

For Steel Authority of India Limited
Visvesvaraya Iron and Steel Plant

(K.MAHALINGAM)
Deputy General Manager (Mines & Raw mat.)

DATE: 13/03/2013

PLACE : Bhadravathi.

CERTIFICATE

This is to certify that, provision of M C D R Rules, 1988, have been observed in the preparation of Scheme of Mining (including Progressive Mine Closure Plan) of **Bhandigaddda Limestone** Mine of **M/s. SAIL**, extends over an area of **40.12 Ha**, being the **M. L. No. 2660**, which is situated in Bhandigudda village of Bhadravathi Taluk of Shimoga District, Karnataka state. Wherever the specific permissions are required, the applicant will approach the concerned authorities of Indian Bureau of Mines for granting the permission. It is also certified that the information furnished in the above Scheme of Mining including Progressive Mine Closure Plan is true & correct to the best of my knowledge

KANTHARAJ. K
RQP / GOA / 130 / 2000 / A.

RAMACHANDRA K T
RQP / BNG / 040 / 1985 / A.

CERTIFICATE

This is to certify that, The provision of Mines Act 1952, Rules and Regulations made there under have been observed in the preparation of Scheme of Mining (including Progressive Mine Closure Plan) of **Bhandigudda Limestone Mine** of **M/s. SAIL**, extends over an area of **40.12 Ha** being the **M. L. No. 2660**, which is situated in Bhandigudda village of Bhadravathi Taluk of Shimoga District, Karnataka state. Where specific permissions are required the applicant will approach Director General of Mines Safety, further, Standards prescribed by D G M S in respect of Miners Health will be strictly implemented.

15/3/13

KANTHARAJ. K
RQP / GOA / 130 / 2000 / A.

RAMACHANDRA K T
RQP / BNG / 040 / 1988 / A.

CERTIFICATE

This is to certify, that the plans and sections are prepared based on the lease map duly authenticated by the State Government.

15/3/13

KANTHARAJ. K
RQP / GOA / 130 / 2000 / A.

RAMACHANDRA K T
RQP / BNG / 040 / 1988 / A.

CONTENTS

CONTENTS

CONTENTS

Cont...

CONTENTS

List of Annexure	
Details / Description of Annexure	Annex. No.
Copy of Lease Deed	1
Copy of the letter of approval of Scheme of Mining	2
Copy of the letter of Environment Clearance	3
Copy of letter of Forest Clearance	4
List of leases held by the lessee	5
List of boreholes drilled	6
Analysis report with log	7
Analysis report analyzed by NABL laboratory	8
Environment monitoring report	9
Photo ID & Address proof of authorized person	10
Copy of the R Q P's certificate	11
Feasibility report	12
Area, Volume and tonnage calculations – Reserves & Resources	13
Area, Volume and tonnage calculations – production programme	14
Abandonment cost for five years	15 - 19
Bank Guarantee	20

List of Plates		
Details / Description of Plates.	Scale	Plate No.
Key Plan showing the Environment Plan showing the monitoring locations	1 : 50000	1
Location plan	–	2
Lease Sketch	1 : 7920	3
Surface Plan	1 : 2000	4
Geological Plan	1 : 2000	5
Geological Cross Sections	1 : 1000	6
Geological Longitudinal Cross Section	1 : 1000	7
Borehole Logs	1 : 200	8
1st Year Production and Development Plan for the year 2013 - 14	1 : 2000	9
2nd Year Production and Development Plan for the year 2014 - 15	1 : 2000	10
3rd Year Production and Development Plan for the year 2015 - 16	1 : 2000	11
4th Year Production and Development Plan for the year 2016 - 17	1 : 2000	12
5th Year Production and Development Plan for the year 2017 - 18	1 : 2000	13
Section showing the working limits of Projections of workings	1 : 1000	14
Dump section	1 : 1000	15
Conceptual Plan	1 : 2000	16
Environmental Plan	1 : 5000	17
Environment management plan	1 : 2000	18
P M C P Plan	1 : 2000	19
Mine photographs		20
Boundary pillar photographs		21
G C P photographs		22

TEXT

SCHEME OF MINING OF BHANDIGUDDA LIMESTONE MINE BEING THE M. L. NO. 2660 OF M/s. SAIL – VISL - BHADRAVATHY.

(Prepared under Rule No. 12 of M C D R 1988)

INTRODUCTION.

M/s. Steel Authority of India having their Steel Plant at Bhadravathi under the name **Visweswaraya Iron & Steel Ltd.,** which is undertaken by Government of India. This lease was initially granted over an area of **97.12 Ha** during the year 1963. Where presently the entire area falls under Forest. Thereafter this lease has been renewed two times the first renewal was on 1983 and second was on 2003. During the second renewal **57.00 ha** of forest land was surrendered to the Government and only **40.12 ha** was retained for Mining purpose, where more or less entire area is broken. Both the renewals were for a period of Twenty years. The last renewal i e the second renewal was renewed on 16.05.2003 and it was effected from 01.04.2003 onwards for a period of twenty years; presently this lease is valid till 31.03.2023. A copy of the lease deed is enclosed as **Annexure No. 1.** A copy of the lease sketch is enclosed as **Plate No. 3.**

Presently this lease is having a valid Scheme of Mining prepared for the year 08-09 to 2012-13 and the same was approved vide your office letter No. MS / SMG / Lst – 112 – SZ dated 27.06.2008 a copy of the said approval letter is enclosed as **Annexure No. 2.** The said Scheme of Mining is valid till 31.03.2013. Similarly a Scheme of Mining needs to be prepared for the forth coming years i.e from 2013 – 14 to 2017 – 18 for a period of five years and accordingly the said ensuing scheme has been prepared and submitting for your kind approval.

This Scheme of Mining is approved subject to the conditions / stipulations indicated in the Scheme of Mining approval letter No. RNT/Smg/III-5/Lst-192-SZ Dt. 25.6.13

25/6/13

खान नियंत्रक (दा.मा)
Controller of Mines (S. Z.)
भारतीय खान ब्यूरो
Indian Bureau of Mines
बेंगलूरु / BANGALORE

KANTHARAJ. K
RQP / GOA / 132 / 2009 / A

RAMACHANDRA K.T
RQP / BNG / 040 / 1988 / A

This mine is being operated by mechanized means and opencast method of mining. This mine's rated capacity is to produce 1,00,000 tonnes of Limestone per annum, where there is a Environment clearance from the State Level Environment Impact Assessment Authority, Karnataka to produce 1.00 lakh tonnes of Limestone a copy of the Environment Clearance is enclosed as **Annexure No. 3.**

Since the Entire area of **40.12 ha** falling under forest, Forest Clearance was obtained for entire 40.12 ha. A copy of the forest diversion obtained so is enclosed as **Annexure No. 4.**

PART–I

1.0 REVIEW OF ~~MINING PLAN~~ / SCHEME OF MINING:

1.1 **Name of Mine** Bhandigudda Limestone Mine

Apart from this lease, Lessee has two more leases which is Kenchapur Quartz Mine and Kammangundi Iron ore mine, the details of these mines are furnished in the prescribed format and enclosed as **Annexure No. 5.**

Location and accessibility:

The said mine falls in the village Bhandigudda under the survey No 1 (part) of Bhadravathi Taluk, Shimoga district of Karnataka State. This Mine lies towards east of northeast of Bhadravathi town and is at a distance of 18.0 Kms (Aerial distance). This mine is accessible by all weather roads from Bhadravathi town till the mine site. A key plan showing the lease area and its surrounding up to 10.0 kms is enclosed as **Plate No.** 1 and location Map showing the lease area and its accessibility is enclosed as **Plate No.** 2. A surface plan showing the detailed survey of the said mine with contour interval of 5.0 M and all the surface features is enclosed as **Plate No. 4.**

Apart from the above survey, G P S reading of all the boundary pillars has been recorder by W G S 84 datum the latitude and longitude of the are shown in below table:

Sl. No.	B P No.	Latitude (N)	Longitude (E)
1	A	13° 53' 02.7"	75° 50' 45.9"
2	B	13° 53' 09.3"	75° 50' 47.2"
3	C	13° 53' 07.9"	75° 50' 55.3"
4	D	13° 53' 09.3"	75° 51' 06.7"
5	E	13° 53' 08.2"	75° 51' 12.3"
6	F	13° 53' 11.9"	75° 51' 15.0"
7	G	13° 53' 11.3"	75° 51' 15.9"
8	H	13° 53' 09.5"	75° 51' 15.5"
9	I	13° 53' 01.2"	75° 51' 22.0"
10	J	13° 52' 58.2"	75° 51' 21.1"
11	K	13° 52' 56.4"	75° 51' 29.5"
12	L	13° 52' 55.5"	75° 51' 30.7"
13	M	13° 52' 50.4"	75° 51' 30.5"

Apart from the establishing and fixing above boundary pillars, Three Ground Control Points (GCP) has been fixed and linked with the boundary pillars.

The details of G C Ps are shown below:

G C P No.	Details of G C P	Latitude (N)	Longitude (E)	RL
1	Water Tank	13° 53' 04.4"	75° 50' 43.2"	760.50
2	Mariyamma temple	13° 53' 07.7"	75° 50' 34.9"	765.10
3	Taluk boundary pillar	13° 53' 11.5"	75° 51' 33.2"	868.07

RP – A lies towards 132° 30' with respect to north from G C P No 1 (Water tank) at a distance of 110.00 M and similarly it lies 118° 10' with respect to north from G C P No 2 (Temple) at a distance of 374.00 M. Few photographs of the Mine working, boundary pillars and G C P are enclosed as **Plate No. 20,** 21 & 22 respectively. All the GCP points are marked on Environment Plan and enclosed as **Plate No.** 17.

1.2 Particulars of the Approved Mining Plan / Scheme.
(Under M C R or M C D R Indicate Approval Letter No. & Date)

Presently this lease is having a valid Scheme of Mining prepared for the year 08 -09 to 2012 - 13 and the same was approved vide your office letter No. MS / SMD / Lst – 112 – 82 dated 27.06.2008 a copy of the said approval letter is enclosed as **Annexure No. 2.** The said Scheme of Mining is valid till 31.03.2013.

1.3 Date of commencement of Mining Operation.

Subsequent to the grant of the mining lease in the year 1963.

1.4 Review of compliance Position of Mining Plan / Scheme:

a. **Deficiencies, if any, that existed in the Approved Mining Plan / Scheme to be taken note of and rectified by incorporating suitable proposals for implementation in the scheme of mining.**

No deficiencies were pointed out

b. **Review of compliance Position of Salient features of the Mining Plan/ Scheme on chapter wise basis bringing out marked deviations, if any, and justifications/ reasons thereof. Items to be covered may include exploration, mine development, exploitation, afforestation programme, reclamation and rehabilitation, control of dust noise and ground vibrations and any other significant features.**

i. **Exploration:**

No exploration was proposed during the last scheme period from 2008 – 09 to 2012 -13, as the exploration, which was carried out by DMG and by NMDC was more than sufficient. Below table shows the details of exploration carried out

Sl No.	Exploration agency	No of B H drilled	Cumulative meterage	Remarks.
1.	Department of Mines & Geology	39	2,434.19	Core drill
2.	National Mineral Development Corporation Ltd	14	1,801.10	Core drill
	Total	53	4,235.29	

Totally 67 boreholes were drilled, after surrendering the area of 57.00 Ha and retaining only 40.12 ha for mining purpose, about 9 boreholes were gone outside the lease area. So only 53 boreholes are considered for reserves estimation and to establish the geological structure

A list of boreholes drilled by DMG and NMDC is enclosed as **Annexure No. 6** and few typical logs of the same is enclosed as **Plate No. 5.** Since the exploration has been carried out by way of core drilling in early sixties by DMG & NMDC the analysis report of the same is not available However the grades so available with the log descriptions are enclosed as **Annexure No. 7.** Two face samples of Limestone analyzed by N. A R L laboratory is enclosed as **Annexure No. 8.**

ii) **Mine Development & Exploitation**

Proposed and achieved quantities of production and development are given in below table

Year	Development - Qty : tonnes		
	Proposed	Achieved	% of variation
2008 – 09	5,000	Nil	-
2009 – 10	Nil	10,000	+ 100.00
2010 – 11	5,000	Nil	-
2011 – 12	Nil	Nil	- 100.00
2012 – 13 **	5,000	Nil	100.00
Total	15,000	10,000	- 33.33

** indicates till Feb 2013.

During the last scheme, it was proposed to handle 15,000 tonnes of waste, against only 10,000 tonnes has been handled. This was mainly due to the less production when compared with the proposals.

During the last scheme period, there was no specified location of dumping the waste, but it was only discussed it will be dumped outside the main pit. Accordingly it was dumped outside the pit. The waste was dumped on the existing waste dump which lies towards west of the main pit i e between the co – ordinate and ordinate E . 300 to E . 1600 and N . 950 to N . 800 by increasing approximately 2.00 mts height

Year	ROM - Production - Qty : tonnes		
	Proposed	Achieved	% of variation
2008 – 09	1,01,000	34,808	- 55.54
2009 – 10	1,01,000	48,326	- 52.15
2010 – 11	1,01,000	27,988	- 72.29
2011 – 12	1,01,000	52,667	- 47.85
2012 – 13 **	1,01,000	20,000	- 83.83
Total	5,05,000	1,83,789	- 64.00

** indicates till Feb 2013

Basically, this limestone mine is a captive mine for the Steel industry situated at Bhadravathi. During the last above five years, there was less production, this is mainly due the requirement of the captive industry. As there was no sufficient raw material like Iron ore to feed to the plant. Hence there is a less in productions.

During the last scheme period, the production was proposed mainly in the main pit / quarry, accordingly the production was achieved from main pit only.

Review of plantation details

Year	Plantation Qty : in Nos.		
	Proposed	Achieved	Location
2008 – 09	2,000	2,000	Within the lease opposite to Canteen adjacent to road
2009 – 10	2,000	1,100	
2010 – 11	2,500	2,500	
2011 – 12	2,500	2,500	
2012 – 13 **	2,500	NIL	
Total	11,500	8,100	

** indicates till Feb 2013.

1.80 Ha has been covered under plantation and the survival rate is about 60 %.

Review of Environmental monitoring Details

Regular monitoring of quality of air, noise, water, soil, in core zone & buffer zone the report of the same is enclosed as **Annexure No. 9.** And the details are discussed in the foregoing paragraph **Environment Management Plan vide Para 9.0**

Land Reclamation & Rehabilitation.

In the last approval of scheme of mining along with the EMCP, it was proposed to retain the pit as a water pond, which will cater the wild inhabitants, agriculture / sericulture purpose. Since the deposit is not totally exhausted, so presently it cannot be created as a pond. This will be taken only at the conceptual stage.

Waste Management.

About 10,000 tonnes of waste was generated against proposed 15,000 tonnes. The generated waste was dumped in the area earmarked for the purpose. This was systematically dumped in a phase wise manner.

x. **Review of Compliance Position of conditions and stipulations imposed, if any, while approving Mining plan/Scheme In case non-compliance, partial compliance, detailed justification reasons thereof may be furnished along with proposal for compliance in ensuing period.**

There are no any special conditions and stipulation was imposed while approving the Scheme of Mining. The conditions so imposed is the general condition, a copy of the same is enclosed as **Annexure No. 2.** However the some of the imposed conditions are detailed below:

1. A copy of EIA / EMP report, approved by MoEF, New Delhi, should be submitted to this office as well as Regional Controller of Mines, Indian Bureau of Mines, Bangalore, within one month of its approval along with the copy of the approval letter.

2. The company shall establish environment monitoring cell. Environment monitoring cell of the company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core and buffer zone, as per the department of the Environment guidelines and keeping in view IBM's circular 3 / 92, season wise every year or by engaging preferably the services of an Environmental laboratory by MoEF approved / CPCB. The data so generated shall be maintained in a bound page

register kept for the purpose and the same shall be made available to the inspecting officer on demand.

3. The validity period of the financial assurance should be renewed before the expiry of the same and should be submitted to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, under intimation to this office.

4. A yearly report shall be submitted to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore before 1st of every setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved mine closure plan.

x. **Review of compliance of violations pointed out after inspections made under MCDR, 1988 during the last five years. The position emerging out of the yearly review of mining plan/scheme while checking up implementation in the field shall also be taken note of at this stage.**

There was no inspection during the last five years.

x. **Any other points requiring attention in the interest of proper mine design Development, Conservation and Environment & Ecology of the area.**

With due conservation of mineral, management is interested to operate the mine very scientific & systematic method of mining. Moreover to the utilize the mineral resources very much conservative, the limestone is now classified in to two parts one is High CaO where CaO is more than 45 % while the other is Low CaO where CaO varies form 35 to 45 in which sub grade and low grade is also included.

Since the material is used for a captive steel industry, the low CaO will be blended with the high CaO with the required proportion based on the generation of the material and will be transported to the captive Steel Industry which is situated at Bhadravathi.

PART - II

2.0 PROPOSAL UNDER SCHEME OF MINING FOR THE NEXT FIVE YEARS.

2.1 Name and Address of the Lessee.

M/s. Visweswaraya Iron & Steels Plant Ltd., of SAIL.
P. O Box No. 126
Bhadravathi, Shimoga District - 577301
Ph +91 8282 671627
Fax +91 8282 2716 11

Since the firm is Limited and public sector Company, so company has authorized **Mr. K. Mahalingam – Dy G M (Mines & Raw Material)** to sign all the related papers / document in connection with the Bhandigudda Limestone mine, the authorization letter is enclosed under certificates and the photo ID and address proof is enclosed as **Annexure No. 10.**

2.2 Name and Address, Registration Number of the Recognized Persons together with the Validity Date / Person employed under Rule 42 (i) (b) who has prepared the mining scheme.

Name	KANTHARAJ. K	RAMACHANDRA K T
Address	C/o METAMORPHOSIS	
	Branch office and Environment Laboratory:	
	K S E Bhavan, 4th Main, 2nd Cross, 2nd Block,	
	Kuvempu Nagar, TUMKUR – 572 103	
	Head Office:	
	# 43, 2nd Floor, 4th Cross, 39th Main, Behind CSTRI	
	BTM layout, 1 Stage,	
	BANGALORE – 560 068	
RQP No.	RQP / GOA / 130 / 2000 / A	RQP / BNG / 040 / 1988 / A
Validity	5th October, 2022	09.10.2020
Tel Fax No:	+91 80 26785005, +91 816 2285200 & +91 816 4021036	
Mobile	+91 94483 84321	+91 9686808415
E - mail	kantharaj@metamorphosis-india.com, rachi@metamorphosis-india.com	

Copy of the RQP certificates of the above RQP's is enclosed as **Annexure No. 11**

2.3 Mineral (s) to be mined. : Limestone

2.4 Area and date of expiry of lease. :

The lease has been renewed two times; the first renewal was in way back 1981, and second was on 01.04.2006 with effect from 01.04.2003. During the second renewal **87.00 ha** of forest land was surrendered to the Government and only **40.12 ha** was retained for Mining purpose, now the total extent of the Mining Lease is **40.12 Ha** and this lease is valid till 31.03.2023.

2.5 Date of expiry of five years period for which approved on last occasion:

Date of expiry of previous Mining Plan / Scheme - 31.03.2013.

3.0 RESERVES.

3.1 Category – wise (Proved, Probable and Possible) Reserves Estimated in earlier Mining Plan / Scheme with grades.

The Grade – wise / Category wise reserves furnished in the earlier Scheme of Mining for Limestone is indicated below

Unit : 000 tonnes

Category	ROM Limestone	UNFC Code
A. MINERAL RESERVES :		
Proved	5,073	1 1 1
Probable	7,694	1 2 1 & 1 2 2
Total (A)	**12,767**	
B. REMAINING RESOURCES :		
Feasibility		2 1 1
Pre-feasibility		2 2 1 & 2 2 2
Measured		3 3 1
Indicated		3 3 2
Inferred		3 3 3
Reconnaissance	6,442	3 3 4
Total (B)	**6,442**	
Total (A+B)	**19,209**	-

3.2 Depletion of Reserves.

During the last Scheme period i e till 28.02.2013 the mining operation was merely small quantity hence the total production was only 1,85,789 tonnes and the proved reserves was depleted by the same quantity and the balance reserves is **12.583 million tonnes**.

3.3 Additional Reserves Established category-wise (with basis and parameters considered).

Based on the UNFC, the deposit appears to be strata bound of regular habit being the geological axis as G1, Economic axis E 1 and the feasibility axis F1. The feasibility study of the report is enclosed as **Annexure No. 12.** No additional reserves have been established. But after updating the geology in detail and re-casting all the geological cross sections considering the available exploration data, techno – economic feasibility and all the technical and practical constraints, entire pit is re designed and the reserves are re estimated as per the U N F C guideline, where there is reduction in reserves to an extent of **2.319 million tonnes.** The re-estimated reserve is furnished in the fore going paragraphs.

This area has been explored by Department of Mines & Geology, Government of Karnataka and National Mineral Development Corporation Ltd., a public sector company way back in early sixties. The details of the exploration carried out by the above said agencies are shown in below table:

Sl No.	Exploration agency	No of D H drilled	Cumulative meterage	Remarks.
1	Department of Mines & Geology	39	2,424.19	Core drill
2	National Mineral Development Corporation Ltd.,	14	1,801.10	Core drill
	Total	53	4,235.29	

Totally 62 boreholes were drilled, after surrendering the area of **57.00 Ha** and retaining only **40.12 ha** for mining purpose, about 9 boreholes were gone outside the lease area. So only 53 core drill boreholes are considered for reserves estimation and to establish the geological structure.

The above said 53 boreholes are drilled at an interval of 200 X 200, 100.0 M X 100.0 M and also at places it drilled in spacing of 50 M X 50 M by covering an area of 28.00 ha. Cross section were prepared at an interval of 100.0 M. based on the available exploration data and the surface geological mapping coupled together, it was found that the Limestone body extends over an length of 900.0 M, width of the limestone is varying from 100.0 M to 500.0 M width an average width of 300.0 M. And the depth of the limestone is more than 300.00 M. The Bore Hole No BGD 05, BGD12 & BGD 13 has proved the limestone deposit up a depth of 182.0 M, 335.0 M & 347.5 M respectively. But for the estimation of the reserves 652.0 MRL (i.e up to a depth of 50.0 M from the bottom most of the pit) is considered. Though the limestone persists below, but only few boreholes has encountered, hence it is only considered up to 652.0 M MRL.

Method of estimation:

The estimation of ore reserves is made by conventional parallel cross section method using geological cross section. The geological cross sections are prepared at a regular interval of 100 M across the strike of the ore body. The area of individual litho units in the each and every cross section of respective benches is calculated separately. The volume between the cross section is arrived on the basis of the averaging the area of parallel cross section i. e. ((S1 + S2) / 2) and multiplying sectional interval. Tonnage is arrived by multiply by its bulk density. For estimating the reserves only the core drill data are considered.

Categorization of Limestone:

While establishing the reserves, + 35 % CaO is considered as the cutoff grade and also as threshold value. Since the limestone is used for steel manufacturing industry only two type of limestone is categories and the parameters so considered for establishing the ore reserves are shown in below table:

Category / Grade	CaO in %	R_2O_3	MgO	SiO_2	Bulk Density	Recovery	Sec. Interval
High CaO	45	5.0 % max	2.00 – 5.00	6.5 max	2.5	95.0 %	100.00
Low CaO	+35 / -45%		3.00	12.0 max	2.5	95.0 %	100.00
Shales / Phyllites Inter Clay / Waste	Generated from the R C M about 5 %				2.5		100.00

A Geological plan showing the different litho unit and its structural attitudes, drilled holes are marked and enclosed as **Plate No. 5,** and the geological cross sections are prepared at regular interval of 100 M and longitudinal section has been prepared along N 950 (I – I'), showing the different litho units and limits of proved reserves which is enclosed as **Plate No. 6 & 7.** A typical borehole logs is enclosed as **Plate No. 8.**

Since the exploration has been carried out by way of core drilling in early sixties by DMG & NMDC the analysis report of the same is not available. However the grades so available with the log descriptions are enclosed as **Annexure No. 7.** Two face samples of Limestone analyzed by N A B L laboratory is enclosed as **Annexure No. 8.**

3.4 **Category wise updated Reserves with grade. (Indicate end use grade with analysis), as well as marginal grades.**

Subsequent to the depleted reserves of 1.83,789 tonnes up to Feb - 2013, the balance reserves is 12.583 **million tonnes** including both proved and probable reserves which corresponds to the earlier reserves furnished in the last scheme of Mining.

But after updating the geology in detail and re-casting the all the geological cross sections considering the available exploration data, techno – economic feasibility and all the technical and practical constraints, and also considering the U N F C guidelines that the drill grid up to 200 mts considering 1 1 1 and 200 – 400 grid as 1 2 2, entire pit was re designed and the reserves were re estimated. Where there is reduction in the reserves to an extent of **2.319 million tonnes** (including both proved and probable). The re-estimated reserve is furnished in the below table:

Reserves as on 01/04/2013					Unit :000' MT
Category	Limestone - R O M			Waste rock	UNFC Code
	High CaO	Low CaO	Total		
A. MINERAL RESERVES :					
Proved Mineral Reserves	5,332	2,919	**8,251**	1,950	1 1 1
Probable Mineral Reserves	2,013	-	**2,013**	100	1 2 2
Total (A)	**7,345**	**2,919**	**10,264**	**2,050**	
B. REMAINING RESOURCES :					
Feasibility	4,690	-	**4,690**	235	2 1 1
Pre-feasibility					2 2 2
Measured					3 3 1
Indicated					3 3 2
Inferred	4,277	2,926	**7,203**	374	3 3 3
Reconnaissance					3 3 4
Total (B)	**8,967**	**2,926**	**11,893**	**609**	
Total (A+B)	**16,312**	**5,845**	**22,157**	**2,659**	

Note: reserves furnished in the above table is as on 01.04.2013, this is by considering the depletion up to 31.03.2013 as per approved Scheme of mining.

Details of Section wise / category wise insitu ore reserves (proved) established is given below:

Unit :000' MT

Proved Mineral Reserves 1 1 1, as on Reserves as on 25/02/13				
Cross Sec. Between	Limestone R O M			Waste Rock
	High CaO	Low CaO	Total	
E 900 / E : 1000	817	181	998	311
E 1000 / E : 1100	1,538	269	1,807	606
E 1100 / E : 1200	1,332	328	1,660	580
E 1200 / E : 1300	948	1,190	2,138	360
E 1300 / E : 1400	479	956	1,435	132
E 1400 / E : 1550	213	-	213	11
Total	**5,332**	**2,919**	**8,251**	**1,950**

The details of calculation of area, volume and tonnage of the above proved reserves is enclosed as **Annexure No. 13.**

Details of level wise / category wise insitu ore reserves (proved) established is furnished below:

Unit :000' MT

Proved Mineral Reserves 1 1 1, as on Reserves as on 25/02/13				
Bench R L	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
730	107	-	107	51
724	89	14	103	199
718	80	114	194	242
712	63	176	239	242
706	205	222	427	231
700	454	355	809	224
694	830	390	1,220	219
688	694	396	1,090	129
682	741	466	1,207	108
676	581	326	907	87
670	506	228	734	81
664	392	84	476	58
658	348	76	424	48
652	242	72	314	48
Total	**5,332**	**2,919**	**8,251**	**1,950**

Details of Section wise / category wise insitu ore reserves (Probable) established is given below:

Unit :000' MT

Probable Mineral Reserves 1 2 2, as on Reserves as on 25/02/13				
Cross Sec. Between	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
E: 1350 / E : 1400	804		804	40
E: 1400 / E : 1550	1,209		1,209	60
Total	2,013	-	2,013	100

The details of calculation of area, volume and tonnage of the above proved reserves is enclosed as **Annexure No. 13.**

Details of level wise / category wise insitu ore reserves (probable) established is furnished below:

Unit :000' MT

Probable Mineral Reserves 1 2 2, as on Reserves as on 25/02/13				
Bench R L	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
742	12		12	
736	235		235	12
730	196		196	10
724	343		343	17
718	418		418	20
712	411		411	21
706	398		398	20
Total	2,013	-	2,013	100

Details of Section wise / category wise insitu ore reserves established is given below:

Unit :000' MT

Measured Remaining Resources 2 1 1, as on Reserves as on 25/02/13				
Cross Sec. Between	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
E: 900 / E : 1000	287		287	14
E: 1000 / E : 1100	731		731	37
E: 1100 / E : 1200	654		654	33
E: 1200 / E : 1300	779		779	39
E: 1300 / E : 1400	1,255		1,255	62
E: 1400 / E : 1550	1,004		1,004	50
Total	4,690		4,690	235

The details of calculation of area, volume and tonnage of the above proved reserves is enclosed as **Annexure No. 13.**

Details of level wise / category wise insitu ore reserves established is furnished below:

Unit :000' MT

Measured Remaining Resources 2 1 1, as on Reserves as on 25/02/13				
Bench R L	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
736	35		35	2
730	38		38	2
724	53		53	3
718	90		90	5
712	157		157	8
706	182		182	9
700	245		245	12
694	317		317	16
688	403		403	20
682	489		489	24
676	557		557	28
670	520		520	26
664	604		604	30
658	692		692	35
652	308		308	15
Total	4,690		4,690	235

The above said measured resources are totally blocked due to the lease boundary constraints.

Details of Section wise / category wise insitu ore reserves established is given below:

Unit :000MT

Inferred Remaining Resources 3 3 3, as on Reserves as on 25/02/13				
Cross Sec. Between	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
E 900 / E 1000	87	21	108	5
E 1000 / E 1100	566	21	587	29
E 1100 / E 1200	795	73	868	42
E 1200 / E 1300	656	91	747	44
E 1300 / E 1400	342	1,022	1,364	75
E 1400 / E 1550	652	1,506	2,158	108
E 1550 / E 1650	806	96	902	42
E 1650 / E 1750	373	96	469	23
Total	4,277	2,926	7,203	374

The details of calculation of area, volume and tonnage of the above proved reserves is enclosed as **Annexure No. 13**

Details of level wise / category wise insitu ore reserves established is furnished below:

Unit :000' MT

Inferred Remaining Resources 3 3 3, as on Reserves as on 25/02/13				
Bench R L	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
736	83		83	4
730	278		278	14
724	312		312	16
718	384	54	438	36
712	338	62	400	20
706	397		397	20
700	321	473	794	40
694	169	486	655	33
688	187	394	581	29
682	153	330	483	24
676	282	284	566	28
670	270	242	512	26
664	484	217	701	35
658	447	221	668	33
652	172	153	325	17
Total	4,277	2,926	7,203	374

4.0 CONCEPTIAL MINING PLAN.

For any mine, Preparation of plan / Conceptual Mine Plan amounts to, fore-seeing in totality and planning for mining and related activities through-out its life span, till such time all the usable mineral / ores are exhausted to the techno - economical limits and the norms laid down by the government agencies from time to time do play important roles.

Therefore, preparation of ideal conceptual mine plan for any mine is difficult and such plan prepared, remains acceptable only under given circumstances. It cannot be over looked that, any such plan undergoes amendments and revisions in the course of progressive stages of exploration and exploitation. It is always borne in mind to bring back near natural shape to the area and its economic value is elevated. It is further ensured that, there is positive contribution to the environment and socio -economic development of the region.

4.1 Anticipated Life of Mine:

Based on the above available reserves of proved which is to an extent of **10.264 million tonnes,** considering the present production of 1.00 lakh tonnes per year the life of the mine will remain more than 100 years. But the management has having the plan to increase the production in future / next scheme period and in conceptual stage, by considering the same the life of the mine would be about 20 years.

Exploration Proposed:

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

This area has been explored by Department of Mines & Geology, Government of Karnataka and National Mineral Development Corporation Ltd., a public sector company way back in early sixties. The details of the exploration carried out by the above said agencies are shown in below table:

Sl No.	Exploration agency	No of B H drilled	Cumulative meterage	Remarks
1.	Department of Mines & Geology	19	2,434.19	Core drill
2.	National Mineral Development Corporation Ltd.,	14	1,801.40	Core drill
	Total	53	4,235.59	

A list of borelocles drilled by DMG and NMDC is enclosed as **Annexure No. 6** and few typical logs of the same is enclosed as **Plate No. 8.**

Since the exploration has been carried out by way of core drilling in early sixties by DMG & NMDC the analysis report of the same is not available. However the grades so available with the log descriptions are enclosed as **Annexure No. 7.** Two nos samples of Limestone and one waste sample drawn by dumps is analyzed by N A B L laboratory is enclosed as **Annexure No. 8.**

The above said 53 borehcles are drilled at an interval of 200 X 200, 100.0 M X 100.0 M, covering an area of 23.00 ha, and 12.00 ha of area needs to be explored fully which is towards west and south western part of the lease. The below table shows the year wise proposed exploration.

Year		No. of holes	Total meterage
First	2013 – 14	10	400.00
Second	2014 – 15	5	200.00
Third	2015 – 15	5	200.00
Fourth	2016 – 17	4	160.00
Fifth	2017 – 18	NIL	
Total		**24**	**960.00**

4.7 Mine development (Ultimate pit limit), optimum exploitation and utilization of mineral.

Taking into consideration of geology and its structural attitudes opencast method of mining is opted where as the mode of working is by mechanized. Since the mode of working is mechanized so the height of the bench is kept 6.00 M max and the width of the bench is kept minimum 10.00 M with an overall bench slope of 31°. The details of production and development till the conceptual period are furnished in below table

The below table shows the production for the successive blocks of five year till the lease period.

Qty. in '000 MT.

Blocks of Five years	Proposed production	Proposed Development
Ensuing scheme period		
1st block (2013 – 14 to 2017 - 18)	500	161
Conceptual period		
2nd block (2018 – 19 to 2022 - 23)	2,000	600
3rd block (2023 – 24 to 2027 – 28)	3,500	625
4th block (2028 – 29 to 2032 - 33)	4,264	664
Total	**10,264**	**2,050**

Presently there are two pits the dimensions of the pits are mentioned below:

(Units in M on an average.)

Pit No.	Pit dimensions.			Area in Ha
	Length	Width	Depth	
1.	580	303	33	17.55
2.	250	150	42	3.75
Total				**21.30**

Though there is two pits presently, but at the conceptual stage, both the pit will get merge and will become one pit. The dimension of the pit will be as below:

(Units in M on an average.)

Pit No.	Pit dimensions.			Area in Ha
	Length	Width	Depth	
1.	900	280	90	25.25

4.8 Waste and Sub grade Mineral Management.

Waste Management / Disposal of waste:

The waste which is likely to generate is topsoil, shales, phyllites and clays and intercalated lime from the limestone which are non – toxic in nature. The total waste likely to generate till the conceptual period is **2.050 million tonnes**, in which **0.113 million tonnes** is topsoil and the balance of 1.937 million tonnes is of waste rocks.

The below table shows the proposed development for the successive blocks of five years till the conceptual period.

Qty: '000 M.T.

Blocks of Five years	Proposed Development
Ensuing scheme period	
1st block (2013 – 14 to 2017 - 18)	161
Conceptual period	
2nd block (2018 – 19 to 2022 - 23)	600
3rd block (2023 – 24 to 2027 – 28)	625
4th block (2028 – 29 to 2032 - 33)	664
Total	**2,050**

The waste rock consists of topsoil, Phyllite, Shale and intercalated Clay. This solid wastes are non – toxic in nature and will be disposed off in the non-mineralized barren ground within the mining lease area earmarked for the purpose.

Two locations are identified for this purpose where one location is an existing dump which lies towards northwestern part of the lease and the other is proposed dump which lies towards southwestern part of the lease. About **6.50** ha of area is earmarked for the purpose (including the existing dump area of 2.00 Ha), where both the area can accommodate about **2.00 million** tonnes of waste. The dumping will be done in phase wise and systematic manner where the dump height does not exceed 30.00 M, and each phase / slice height will not be more than 10.00 M. This area will be sufficient till the life of the mine / conceptual stage.

During the scheme period, the existing northwestern dump will be laterally extended by occupying an additional area of **0.750 ha.** This area can accommodate about 1,70,000 tonnes of waste. The dumping will be done up to 730 MRL where the average height will be 20 M. This area is sufficient for the ensuing scheme period.

Subsequent to the scheme period, **1.776 million tonnes** (excluding the topsoil) of waste is likely to generate till the conceptual period, part of this waste i.e **1.40 million tonnes** will be dumping on the southwestern dump by occupying additional area of **3.75 ha** where this area can accommodate about **1.500 million tonnes.** Dumping will be made up to 725 M R L with an average height of 20.0 M, while the balance water of **0.376 million tonnes** will be backfilled towards the northern portion of the lease area between the ordinates and co – ordinates E : 1220 to E : 1320 and N : 1120 to 1220 by occupying an area of 0.900 ha. This area is proposed for back filling because geologically this area is exposed by dyke and the

shape of the lease area appears to be nose, where working cannot be projected in future coming years.

Thus the area made available for dumping till the conceptual period. The below table shows the details of dumping.

Location of dumping	Capacity In mil. tonnes	Qty., will be dumped	Level in MRL	Area in ha. (L * W) in M.
Northwestern dump	0.170	0.161	730.00	(220 * 75) 1.600
Southwestern dump	1.500	1.400	725.00	(350 * 140) 4.900
Back filling	0.500	0.376	765.00	(110 * 080) 0.900
Total	**2.170**	**1.937**		**7.400**

The ultimate disposition and advancement of dumps is marked on the conceptual plan and enclosed as **Plate No. 14**, and cross section showing the Dump disposition is enclosed as **Plate No. 15.** Thus the area available for dumping is sufficient till the end of the life of the mine.

All the dumps during the course of mining shall be protected as mentioned below.

1. Toe wall shall be constructed all along the toe of the dumps.
2. Garland drains will be provided to arrest the surface runoff and wash off of the dump material.
3. Retention walls will be constructed to check washing of silt, with a dimension of Height 1.50 – 2.0 M and a width of 1.50 M.
4. In addition to above, if any additional protective measures are required, such as bunds, trenches, drains, rubble walls, embankment etc, the same will be constructed.
5. where ever the gully plugs, check dams will be constructed.

During the course of dumping the portion of the dump slopes which becomes inactive / dead, will be terraced and Planted with suitable local species, by seeking guidance from the Forest Department. Due care will be taken to protect the afforested area from fire, pests and cattle's. For healthy growth of the saplings, proper dosage of fertilizer / manuring will be provided, and water will be provided as and when required.

Proposed plantation during the ensuing Scheme of Mining Period and till conceptual stage is given in below table.

Area in Ha.

Period / Block of five years	No. of saplings proposed to plant	Proposed area to be planted	Location / Remark
1st block (13 – 14 to 17 - 18)	12,000	4.00	Near office and stn. Bldg.
2nd block (17 - 18 to 22 - 23)	9,000	3.00	Dump slopes
3rd block (22 - 23 to 27 - 28)	Will be furnishing in next Scheme of Mining		
4th block (27 - 28 to 32 - 33)	Will be furnishing in next Scheme of Mining		
Gr. Total	**21,000**	**7.00**	

The Plantation programme for ensuing scheme period and up to Conceptual plan period, is marked on the Conceptual plan and enclosed as **Plate No. 16.**

Sub grade mineral management.

Mainly the sub grade mineral in this mine is the limestone which is categorized as low CaO. Though it is low CaO the Cao is ranging from 35 to 45 % which is about 37.36 % of the total reserves. Since the limestone generated in this mine is used in their captive steel industry situated at Bhadravathi, the low Cao will be blended proportionately along with the high CaO and the same will be fed to the captive steel industry. Due to any constraints if the same can not blended it will be stacked in the area earmarked for the purpose.

Environmental Aspects with specific reference to Reclamation Measures.

With due concern towards Environmental Protection and company's social responsibility, management has the engaged services of external agencies to monitor season wise environment parameters. The data so generated is helpful in taking necessary steps to mitigate adverse effects due to mining.

Land restoration and reclamation is very much essential in any mining industry. Presently the proved reserves is up to 652 MRL, but whereas the limestone persists below this level and due to practical and due to the lease boundary constraints entire deposit cannot be worked. Hence no backfilling is proposed in the main pit. This can be done only when additional area is granted as Mining Lease, only after exploiting entire deposit it can be planned for back filling. But as at today it is proposed to backfill part of the pit which is towards northern portion of the lease area between the ordinates and co – ordinates E 1220 to E 1320 and N 1120 to 1220 by occupying an area of **0.900** ha. This area is proposed for back filling, because, geologically this area is exposed by dyke and the shape of the lease area appears to be nose, where working cannot be projected in future / coming years.

The ore bearing area will be mechanically mined out upto the ultimate pit limit maintaining required bench height and width with due consideration for slope stability. As a result, a pit will be formed. The ultimate pit will be about 800 M X 315 M approximately which covers an area of 25.250 ha approximately will be used for the ground water recharge pond.

The quantity of waste likely to generate till the conceptual period is about 1.311 million tonnes (including the topsoil) and entire quantity is planned to dump within the lease area. There no backfilling is proposed.

The land use details as at present, till scheme period and Conceptual stage is shown in the tabular form.

Unit in Hs.

Type of activity	Present	Scheme	End of the Mine's life
Area under mining	21.300	21.300	25.250
Storage for top soil	0.500	0.500	0.500
Overburden/ Dumps	2.000	2.750	6.500
Mineral storage / Sub-grade stock	0.500	0.500	0.500
Infrastructure (Workshops, Office)	0.500	0.500	0.500
Roads	0.750	0.750	0.750
Railways	-		-
Green Belt / plantation	1.800	5.800	5.800
Tailing Pond	-		-
Effluent Treatment Plant /Factory	-		-
Mineral Beneficiation Plant			
Township Area	-		-
Others (to be specified) Canal	-		-
Area remains undisturbed.	12.770	8.320	0.320
Total	**40.120**	**40.120**	**40.120**

Thus in brief, the Conceptual Mining Plan of said mines envisages a methodical & systematic approach to mine development.

5.0 MINING

5.1 Salient description of Present Mining Method.

Existing Parameters of the working benches:

During the last Scheme of Mining period, it was proposed to work by mechanized means where the average height of the benches were maintained 6.0 M and width of the benches were maintained 10.0 M maintaining the pit slope of 31 degree.

Presently there are two pits the dimensions of the pits are mentioned below.

(Units in M on an average.)

Pit No.	Pit dimensions.			Area in Ha
	Length	Width	Depth	
1.	580	303	38	17.55
2.	250	150	42	3.75
Total				21.30

This mine is being operated by mechanized means and opencast method of mining. This mine's rated capacity is to produce **1,50,000 tonnes** of Limestone per annum, where there is a Environment clearance from the State Level Environment Impact Assessment Authority, Karnataka to produce the same. A copy of the Environment Clearance is enclosed as **Annexure No. 3.**

Proposed parameters of the working benches:

During the last Scheme of Mining period, it was proposed to work by mechanized means where the average height of the benches were maintained 6.0 M and width of the benches were maintained 10.0 M maintaining the pit slope of 31 degree. The same method and mode of operation is continued in the ensuing Mining Scheme Period also. This method and mode of operation is taken into account mainly by consideration of all the parameters and the geological attitudes of the ore body and mine is proposed to work with conventional opencast method of mining, in which faces are gradually advanced sideward lowering benches to win lower level ores. Mode of mining is mechanized with a bench system is adopted to work the deposit.

Based on the mode and method of mining adopted and taking into the consideration of geological parameters of the ore body and the geo-technical field observations made thereof, the mining Pit is designed such that the height is about 6.00 M and the width is 10 M, maintaining 31° pit slope along the footwall and the hanging wall side. These slopes are designed based on conditions of the strata and structural attitudes of both hanging wall and footwall formations.

The Ultimate Pit Limit so drawn on the basis of the field studies, exploration data and the present geological mapping carried out so far in the area remains very tentative. However, based on the future exploration the defined, **ULTIMATE PIT LIMIT** is likely to change. The said Ultimate Pit Limit is demarcated on the geological plan and enclosed as **Plate No. 5.**

Since there is drilling and blasting in this said mine, to excavate / exploit the ore, initially, it will be drilled and blasted. Hydraulic excavators will be deployed for mineral winning/excavation of the ore and loading the same in tipper trucks. For transportation 10 tonne dumpers will be used to stock yard, sub-grade stock and even up to factory. Since the Limestone is hard in nature the drilling and blasting will be restricted only to the hard strata. While the wastes are soft in nature the same will be removed with the help of the excavators. The ore and waste will be exploited separately. The waste will be carried to the waste dump and it will be disposed off. The ore will be carried to the to the steel factory for the manufacture of Iron & Steel. The roads with in the pit will be maintained at 1: 16 gradient, where ever it is not possible to maintain due to practical constraints it will be maintained at 1: 12. For the future development and production a systematic mine working is proposed for the next five years keeping the long benches and good width for the movement of the mining machineries and for transportation. One Motor grader / wheel loader will be continuously deployed for road maintenance for smoother operation of the mining machineries and transportation.

The benches so not properly maintained, the rectification of the same is done during the first two years of the ensuing scheme period the same are depicted in the production and development plan enclosed as **Plate No. 9 & 10.**

Drilling and Blasting:

Since the mining is proposed to work by mechanized and the benches are kept 6.0 M height and the limestone is a material which is hard to very hard in nature it requires the drilling and blasting to exploit the same. On an average about 300 – 350 tonnes of material required to be drilled and blast. The broad blasting parameters are determined for the blasting pattern and blast design, which are as follows:

...hole diameter is normally 115 mm and the depth of the hole is 7.0 meters inclusive of sub grade drilling of 1.0 meters to avoid toe formation. Blasting pattern is generally square or staggered with burden ranging from 3.0 to 3.5 meters and spacing of 3.5 to 4.0 meters.

Usually single / double row of holes is blasted along free face to achieve optimum powder factor, best fragmentation and minimized adverse impacts on account of blasting. Maximum numbers of holes will be blasted at a time in a round are generally limited to 75 to 80 with inter hole delay detonators to mitigate adverse impacts such as air blast, throw and the ground vibration. Holes are electrically detonated using shot in detonators.

ANFO types of explosives are used for blasting with 20 to 25 percent, proportion of primer booster cartridges and rest as column charge. About 20 kgs of explosives are loaded in 115 mm diameter holes and powder factor ranging between 6 to 8 tons per kgs of explosives is achieved.

5.2 Yearly pit – wise Development Plan proposed depicted on plans and sections :

Year wise locations of development and production blocks with respective co ordinates / ordinates and working RLs are shown in table below:

Year	YEAR WISE PRODUCTION AND DEVELOPMENT BLOCKS		
	Pit No.	Ordinates / Co – ordinates	Working RLs.
1st year 13 – 14	1	E : 980 to E : 1230 & N : 850 to N : 980	700 / 724
2nd year 14 – 15	1	E : 970 to E : 1260 & N : 820 to N : 1050	700 / 724
3rd year 15 – 16	1	E : 980 to E : 1250 & N : 850 to N : 1025	694 / 700
4th year 16 – 17	1	E : 1000 to E : 1175 & N : 920 to N : 1035	694 / 700
5th year 17 – 18	1	E : 1140 to E : 1250 & N : 900 to N : 1020	694 / 700

The working Limits of Limestone and its development are shown on the respective year wise production and development plans which is enclosed as **Plate No. 9 to 13**, the year wise proposed working limits are shown of the geological cross section along with the structure and disposition of the ore body and waste rock which is enclosed as **Plate No. 14.**

5.3 Year wise Production plan proposed for next Five years along with grade. Blending Proposal, if any, may be indicated.

Below table shows the year wise production and development of Limestone for the ensuing scheme period:

Year wise production and Development schedule — Unit :000 MT

Year	Limestone - R O M			Waste Rock	Stripping ratio	Total Handling
	Total	High CaO	Low CaO			
1st year 13 – 14	100	80	20	71	1: 0.71	171
2nd year 14 – 15	100	78	22	75	1: 0.75	175
3rd year 15 – 16	100	100		5	1: 0.05	105
4th year 16 – 17	100	100		5	1: 0.05	105
5th year 17 – 18	100	86	14	5	1: 0.05	105
Total	**500**	**444**	**56**	**161**	**1: 0.32**	**661**

Below table shows the year wise / level wise production and development schedule for Limestone:

Unit : 000 MT

1st Year wise production and Development schedule 13 - 14						
Bench RL	Limestone - R O M					Waste Rock
	Total	High CaO	CaO %	Low CaO	CaO %.	
724						10
718						12
712						20
706	8	8	50.12			24
700	92	72	50.68	20	42.38	5
Total	**100**	**80**	**50.62**	**20**	**42.38**	71

During the first year, five benches from 700 to 724 RL which are inwards south western part will be extended towards southwestern side. And the ordinates and co ordinates of working are given in the above **chapter 5.2**

Unit : 000 MT

2nd Year wise production and Development schedule 14 -15						
Bench RL	Limestone - R O M					Waste Rock
	Total	High CaO	CaO %	Low CaO	CaO %	
724						14
718						12
712						22
706						22
700	100	78	49.80	22	43.90	2
Total	100	78	49.80	22	43.90	75

During the second year also five benches from 700 to 724 RL which are towards south and south western part will be extended towards southerly. And the ordinates and co ordinates of working are given in the above **chapter 5.2**

Unit : 000 MT

3rd Year wise production and Development schedule 15-16						
Bench RL	Limestone - R O M					Waste Rock
	Total	High CaO	CaO %	Low CaO	CaO %	
694	100	100	48.59	-	-	5
Total	**100**	**100**	**48.59**			**5**

During the third year only one bench will be opened at 694 RL which is at the centre of the pit, extending laterally in northwest – south east direction with an average width of 50.0 mts. And overall length of 120 mts And the ordinates and co ordinates of working are given in the above **chapter 5.2**

Unit : 000 MT

4th Year wise production and Development schedule 16-17						
Bench RL	Limestone - R O M					Waste Rock
	Total	High CaO	CaO %	Low CaO	CaO %	
694	100	100	51.30	-	-	5
Total	**100**	**100**	**51.30**	-	-	**5**

During the fourth year also, only one bench will be worked at 694 RL, the bench of the third year will be extended towards north. And the ordinates and co ordinates of working are given in the above **chapter 5.2**

Unit : 000 MT

5th Year wise production and Development schedule 17-18						
Bench RL	Limestone - R O M					Waste Rock
	Total	High CaO	CaO %	Low CaO	CaO %	
694	100	86	49.06	14	42.20	5
Total	**100**	**86**	**49.06**	**14**	**42.20**	**5**

During the fifth year also, only one bench will be worked at 694 RL, the bench of the fourth year bench will be extended towards east. And the ordinates and co ordinates of working are given in the above **chapter 5.2. and** Area, Volume & Tonnage calculations of all the above five years is shown in similar form and enclosed as **Annexure No. 1d**.

The working Limits of Limestone and its development are shown on the respective year wise production and development plans which is enclosed as **Plate No. 9 to 13**, the year wise proposed working limits are shown of the geological cross section along with the structure and disposition of the ore body and waste rock which is enclosed as **Plate No. 14**

During the first two years, upper benches are developed towards southern side. The development can be proposed towards northern side, because, the benches are already developed more or less up to the lease boundary, however during the course of working the development will be done. So during the last three years only bottom benches are proposed

5.4 **Any changes in the proposed Method of mining & deployment of Machinery, together with the reason thereof.**

There is no change in proposed method of mining and deployment of Mining Machinery

5.5 **List of Mining Machinery under use / proposed along with Projected Norms of performance / output for individual Main items of Equipment / Machinery.**

Below table shows the list of mining machineries deployed at this mines:

Sr. No.	Equipment / Machinery	Manufacturer	No. of units	Engine H P	Capacity	Loading rate / Hr.
1	Hydraulic Excavator	Komatsu L&T	1	110	0.9 Cu.M.	200 tons
2	Water Tanker	TATA	1	120	8,000 ltr.	
3	Passenger Van	TATA	1	65	15 Seater	
4	Screw compressor	Ingersol Rand	1	169	450 cfm	
5	Wheel Loader		1	210	1.8 CuM	200 tons
6	Drill machine	Atlas Copco	2		100-115mm	
7	Tippers	Tata	15	115	10.0 tonnes	

The efficiency (i.e availability & utility) as specified for the 1 hydraulic excavator deployed at the mine can handle **0.288 million tonnes** of material as given below:

300 working days X 8-hrs/day X standard rate of handling 200 TPH X average efficiency 80 % X average availability 75 % X No. of units 1 = **0.288 million tonnes**. As said above the equipment to be handled is **0.175 million tonnes** during the second year of scheme period.

Though one loading unit is more sufficient to handle the required capacity one more wheel loader is kept for handling the waste material and also it will be used for miscellaneous work, such as dump leveling and clearing of haulage roads and etc.

Calculation of requirement of Tippers – for hauling of ROM:

On an average about **0.100 million tonnes** (1.00 lakh tonnes) of ore needs to be handled and transported every year from mine to Steel factory which is 18.00 kms (one side) for which 9 tippers are required to fulfill the same. The details of calculation of the same are shown below:

Qty. can handle per truck per trip	:	10.0 tonnes
No. of tippers deployed per day	:	9
No. of trips per trucks per day	:	4
No. of days operated in a year	:	300

Qty. = 9 * 4 * 300 = 1,08,000 Tonnes (0.108 million tonnes)

Considering the lead distance from the mine head to the factory site which is between 18.0 kms one way.

Calculation of requirement of tipper – for hauling of Rejection:

On an average about **0.075 million tonnes** (75,000 tonnes) of waste needs to be handled every year from mine to dump site for which 4 tipper trucks are required to fulfill the same. The details of calculation of the same are shown below:

Qty. can handle per trip per tipper	8.0 tonnes
No. of tippers deployed per day	04
No. of trips per tipper per day	08
No. of days operated in a year	300

Qty. = 04 * 08 * 300 = 76,800 Tonnes.

Hence the waste to be handled max. is 75,000 tonnes during the second year of the scheme period considering the lead distance from the mine head to the dump site which is between 6 to 7 kms.

Adequacy of Drilling Machine:

Considering the annual production of 0.100 million tonnes, on an average the daily production would be 350 tonnes a day. To produce this on an average about 140 - 150 CuM needs to be drilled and blasted, where 3 – 4 holes needs to be drilled and blasted with a cumulative meterage of 21 - 28 M. One drill unit is required to drill out where one unit can drill up to 100 M a day.

6.0 HANDLING OF WASTE / SUB – GRADE MATERIALS:

6.1 **Rate of yearly generation of wastes and proposals for disposals of waste for next Five years. (Indicate sequence of dumping with necessary plans and sections):**

Presently there are six existing dumps, the dimensions of the same are mentioned below:

(Units in M on an average, volume in CuM)

Pit No.	Dump dimensions.					Area in Ha
	Length	Width	Height	Volume	Tonnage	
1.	30	25	3	2,250	3,600	0.08
2.	170	70	10	1,19,000	1,90,400	1.19
3.	120	25	8	24,000	38,400	0.36
4.	50	20	4	4,000	6,400	0.10
5.	60	20	5	6,000	9,600	0.12
6.	70	30	6	12,600	20,160	0.21
				Total	**2,68,560**	**2.00**

All the above dumps are serially numbered and showed on Surface Plan enclosed as **Plate No. 4**. In all the above dumps, mainly Shale, Phyllite and friable silica is dumped. An analysis report of the dump material analyzed by NABL accredited laboratory is enclosed as **Annexure No. 2.**

The yearly generation of waste such as topsoil, shales and phyllites and the intercalated waste generated from the Limestone is mentioned is furnished in below table:

Qty: MT.

Year	Topsoil	Waste	Total
1st year 13 - 14	-	71,000	71,000
2nd year 14 – 15	-	75,000	75,000
3rd year 15 – 16	-	5,000	5,000
4th year 16 – 17	-	5,000	5,000
5th year 17 - 18	-	5,000	5,000
Total	**-**	**1,61,000**	**1,61,000**

During the ensuing scheme period the production and development are proposed within the broken up area, hence no topsoil is generated. Two face samples of Limestone analyzed by N.A.B.L laboratory is enclosed as **Annexure No. 3.**

Year wise locations of dumping blocks with respective co-ordinates / out crop area and RLs are shown in table below:

YEAR WISE DUMPING BLOCKS FOR WASTE

Year	Dump	Ordinates / Co ordinates	Extent	RLs
1st year 13 – 14	North	N : 1050 - N : 1130 & E : 790 - E : 850	0.350	710 - 720
2nd year 14 – 15	Western	N : 1070 - N : 1130 & E : 740 - E : 880	0.400	710 - 720
3rd year 15 – 16	- do -	N : 1070 to N : 1150 & E : 815 to E : 950	Over the same dump	720 - 730
4th year 16 – 17	- do -			
5th year 17 – 18	- do -			

The location of said dump is shown on the respective production & plan enclosed as **Plate No. 9 to 13** and a cross section showing the dump disposition is marked on the dump section and enclosed as **Plate No. 15.**

During the scheme period, presently, the existing northwestern dump which lies within the lease area will be laterally extended by occupying an additional area of **0.750 ha.** This area can accommodate about 1, 70,000 tonnes of waste. The dumping will be done up to 720 MRL where the average height will be 10 M. This area is sufficient for the first two year of the ensuing scheme period. The waste generating during the next three years will be dumped over the said dump up to 730 MRL after leaving 10 – 15 M barrier from the edge of the dump.

The waste such as clay, shale and phyllite, will be dumped in the area earmarked for the purpose such that the height of the dump will not exceed 20.0 M. Initially the dumping will be done up to 720 MRL (10.0 M height) there after the same dump will be increased by additional height of 10.0 M (up to 730.0 MRL), terracing and pitching will be done at an interval of 10.0 M. The details of scheme of dumping are discussed in the subsequent paragraphs.

6.1.1. Build up of dumps from year to year to be shown in yearly plans and sections with description of the method and manner of disposal of waste rock, designed capacity & height of individual dumps, and precautions envisaged for confinement of the dumps together with design details of the protective works.

The waste generated during the scheme period will be dumped within the lease area, earmarked for the purpose. The land profile chosen for the dumping is plateau with minor undulation, initially it will be dumped up to 720 MRL (10.0 M height) there after the same dump will be increased by additional height of 10.0 M (up to 730.0 MRL), terracing and pitching will be done at an interval of 10.0 M. The buildup of dumps on yearly basis is

indicated in **Plate No. 9 to 13.** And a Cross Section showing the year wise dump disposition is shown in **Plate No. 15.**

Waste generated at the mine is transported to dumping site by ten-ton capacity tipper. A wheel loader is continuously provided to level waste material unloaded by tipper Trucks and spread laterally in area earmarked. Continuous movements of tipper trucks while unloading consolidate the ground. Water is regularly sprinkled in rounds over the dumps to control the blowing dust. Thus, with dozing, end tipping and consolidation dump is built up in stages.

While building up, dumps are properly graded and terraced with provision of contour drainage. Terracing is always accompanied with plantation for stabilization of terraced slopes. As far as possible, dumps are erected in low lying areas. It is always ensured that, dump height does not exceed 30.0 M or tallest growing trees of the region. Dump slopes are suitably protected from any environmental damages, providing all the protective measures described as below:

Year wise proposed plantation for the ensuing Scheme of Mining is given in below table:

Years	No. of saplings proposed to plant	Area in Ha. Proposed to be covered	Location / Remark
1st year 13 – 14	2,250	0.75	Near office and statutory building
2nd year 14 – 15	2,250	0.75	
3rd year 15 – 16	1,500	0.50	
4th year 16 – 17	3,000	1.00	
5th year 17 – 18	3,000	1.00	
Gr. Total	**12,000**	**4.00**	

Plantation will be carried out by seeking guidance from the Forest and any concerned Department. Preferably local species will be planted. Due care will be taker to protect the plantated area from fire, pests and cattle's. For healthy growth of the saplings, proper dosage of fertilizer / manuring will be provided, and water will be provided as and when required. Apart from the plantation, to protect the erosion due to monsoon and surface run off the protective measures such as trenching and retention wall are constructed.

The year wise proposed protective measure for the ensuing Scheme period is given in below table:

Years	Trench			Retention wall			Location / Remark
	L	W	D	L	W	H	
1st year 13 – 14	250	0.50	0.50	250	0.75	1.00	Dump top
2nd year 14 – 15	200	0.50	0.50	200	0.75	1.00	- do -
3rd year 15 – 16	150	0.50	0.50	150	0.75	1.00	do
4th year 16 – 17	150	0.50	0.50	150	0.75	1.00	- do -
5th year 17 – 18	150	0.50	0.50	150	0.75	1.00	- do -
Gr. Total	**900**	**0.50**	**0.50**	**900**	**0.50**	**0.50**	**- do -**

Sub grade mineral management.

Mainly the sub grade mineral in this mine is the limestone which is categorized as low CaO. Though it is termed as low CaO the percentage of Cao is ranging from 35 to 45 %, because the feed to the steel factory is taken as + 45 as cut off. During the ensuing scheme period the generation of the low CaO is about 11.20 % of total production. This material generation is incidental to the working of higher grade of ROM. Below table shows the year wise production of low CaO:

Unit : MT

Year	Total ROM
1st year 13 – 14	20,000
2nd year 14 – 15	22,000
3rd year 15 – 16	-
4th year 16 – 17	-
5th year 17 – 18	14,000
Total	**56,000**

Since the limestone generated in this mine is used for their captive steel industry situated at Bhadravathi, the low Cao will be blended proportionately along with the high CaO and the same will be fed to the captive steel industry. Due to any constraints if the same cannot blended it will be stacked in the area earmarked for the purpose. The location of the same is shown on the EMP plan enclosed as **Plate No**. 18 and also on Conceptual plan enclosed as Plate No. 16.

USE OF MINERALS.

Changes proposed in the use of mineral, if any, with reasons.

Limestone produced form this mine will be utilized for their own captive Iron and Steel manufacturing Industry situated at Bhadravathi.

Changes in Specifications, if any, imposed by the User Industries and / or specifications required in case of new User industries, if any.

No changes are made in the specifications.

Efforts made for the utilization of the sub grade mineral:

Mainly the sub grade mineral in this mine is the limestone which is categorized as low CaO. Though it is termed as low CaO, the percentage of Cao is ranging from 35 to 45 %, because the feed to the steel factory is taken as + 45 as cut off. During the ensuing scheme period the generation of the low CaO is about 11.20 % of total production. This material generation is incidental to the working of higher grade of ROM. Since the limestone generated in this mine is also used for their captive steel industry situated at Bhadravathi, the low Cao will be blended proportionately along with the high CaO and the same will be fed to the captive steel industry. Due to any constraints if the same cannot blended it will be stacked in the area earmarked for the purpose. The location of the same is shown on the EMP plan enclosed as Plate No. 18 and also on Conceptual plan enclosed as Plate No. 16.

MINERAL BENEFICIATION.

Results of any Beneficiation investigation conducted and change made in the existing mineral Beneficiation plant and Tailing disposals, if any, with benefits expected (necessary flow sheet and tailing dam design etc., to be submitted as applicable), Design and capacity of the tailing pond.

Beneficiation test done, if any, on sub grade mineral including fines and proposal for installation of new additional Beneficiation facility, if any.

NOT APPLICABLE AS THERE IS NO MINERAL BENEFICIATION PLANT

6.0 ENVIRONMENTAL MANAGEMENT PLAN.

During the last scheme period, the waste handling was only 10,000 tonnes. This material was dumped in the existing dump on the quary No. 2 (Presently termed as Northwestern dump). To protect the same only the protective bund was constructed with an overall length of 200 mts with a width of 1.00 mts and height of 1.50 mts. This protective measure was adopted to mainly contain the wash off during the monsoon.

Apart from this, about 1.80 ha of plantation was carried out towards west of the mineral storage area by planting 8,100 saplings of local species such as casurina, acacia and etc. the survival growth was about 60 – 70%.

As per the guidelines, the monitoring of the Environmental parameters such as Air, Water and Noise were monitored in house and the analysis report of the same is enclosed as **Annexure No. 9.** Based on the analysis it is found that all the values are within the permissible limit. The details of the values are furnished in foregoing pages.

6.0 Environmental Management Plan

Salient Features.	Proposals as per approved mining plan (indicate date of approval of mining plan.)		Position at the end of 5 years of mining plan period (Justification to be given for any marked deviation)		Proposal for the next 5 years plan period		
1	2		3		4		
Top soil storage. Preservation and utilization.	There was no proposal of topsoil generation.		No generation of topsoil		Since the workings are proposed within the worked out pit no topsoil is anticipated.		
Waste dump management.	The waste likely to generate was supposed to dump within the lease area.		As per the proposals it was dumped within the lease area on the northwestern dump		The waste likely to generate is 1.61 million tonnes (inc. topsoil) the same will be dumped within the lease area, the detail scheme of dumping is furnished in the above paragraph 6.1.1 and 6.1.1		
	Year	Waste Rock in tonnes	Year	Waste Rock in tonnes	Year	Waste Rock in tonnes	
	2008 - 09	5,000	2008 - 09	Nil	13 – 14	71,000	
	2009 – 10	Nil	2009 – 10	10,000	14 – 15	75,000	
	2010 – 11	5,000	2010 – 11	Nil	15 – 16	5,000	
	2011 – 12	Nil	2011 – 12	Nil	16 – 17	5,000	
	2012 – 13	5,000	2012 – 13	Nil	17 – 18	5,000	
	Total	**15,000**	**Total**	**10,000**	**Total**	**1,61,000**	

1	2	3	4
Land Reclamation and rehabilitation. **Plantation program.**	No proposals were made during the scheme period. The proposed plantation during the plan period is given below:	No reclamation was carried out. The achieved plantation during the plan period is given below:	No proposals are made during the ensuing scheme period. The proposed plantation during the Scheme period is given below:

Year	Area in Ha	Total saplings proposed	Year	Area in Ha	Within the lease	Year	Area in Ha	Total saplings proposed
2008 - 09	No area was given	2,000	2008 - 09	1.80	2,000	13 – 14	0.75	2,250
2009 - 10		2,000	2009 – 10		1,100	14 – 15	0.75	2,250
2010 – 11		2,500	2010 – 11		2,500	15 – 16	0.50	1,500
2011 – 12		2,500	2011 – 12		2,500	16 – 17	1.00	3,000
2012 – 13		2,500	2012 – 13	-	Nil	17 – 18	1.00	3,000
Total		**11,500**	**Total**	**1.80**	**8,100**	**Gr. Total**	**4.00**	**12,000**
	The survival rate of the plantation is about 60 %							
Precautions proposed for survival & protection of plantations.	It was proposed to take care from cattle's and pesticides.		Care was taken.			It is proposed to take due care, to protect the afforested area from fire & pests. Plants will be provided fertilizer / Manuring regularly for healthy growth and adequate water as and when required. It is proposed to plant the saplings near and surrounding office and structural blings.		

1		2	3	4
Quality of Air		As per the norms and the guidelines laid down by the MoEF / IBM monitoring was carried out	Accordingly it was carried out, a copy of the monitoring report is enclosed as **Annexure No. 9**	It is proposed to carry out the Environment Monitoring of all the parameters as per the norms.
Quality & makeup of water including surface & ground water.		No water is drawn / fetch from surface / ground water.		
Noise level	**Source of noise to be identified.**	The source identified are, noise generated from mining machinery, transportation of trucks and drilling.	Identified sources are, noise generated from mining machinery, transportation of trucks and drilling.	The source identified are, noise generated from mining machinery, transportation of trucks and drilling.
The values so obtained of the environment monitoring are well within the limit and the brief description of the same is discussed in foregoing pages.				
Vibration	**Pattern of blast holes & design of blast with details of sufficient number of experimental blast conducted to be given.**			Blast hole diameter is normally 100 mm and the depth of the hole is 7.0 meters inclusive of sub drilling of 1.0 meters to avoid toe formation. Blasting pattern is generally rectangular or staggered with burden ranging from 3.0 to 3.5 meters and spacing of 3.5 to 4.0 meters. Usually single row of holes is blasted along the face to achieve optimum powder factor. Maximum numbers of holes will be blasted at a time are generally limited to 10 to 15.

Treatment of mine water and effluent / toxic substances before discharge.	No treatment and discharged is carried out of mine water effluents / toxic substance	No treatment and discharged is carried out of mine water effluents / toxic substance		There is no any treatment of any mine water, as there is no discharge of mine water. During the monsoon the rain water will be collected in the pit and the same will get dry subsequent to the monsoon, hence no arrangements are made for discharge of the rain water.
Re – circulation of treated water.	Since there is no any beneficiation plant, hence no re-circulation of water.	Since there is no any beneficiation plant, hence no re-circulation of water		Since there is no any beneficiation plant, hence no re-circulation of water

AIR MONITORING:

Totally seven locations (including both core and buffer zone) was identified to know the air quality in which three in buffer zone and four in core zone. Below table shows the locations monitored

Sl. No	Zone	Location / Station	Code	Remarks
1	Buffer Zone	Bhandigadda village	A - 2	The values so obtained found within the permissible limit.
2		Badanchal village	A - 3	
3		Gangur	A – 4	
4	Core Zone	During operation	A - 1	
5		Loading	A - 5	
6		Drilling	A - 6	
7		Haulage	A - 7	

CORE ZONE:

In the core zone totally four monitoring location were identified to monitor the air quality, accordingly it was monitored and the data so obtained has been compiled location wise to know the quality of air for the period August 2011 to January 2013. The below table shows the lowest, highest and the average values for the above said period:

Location		Operation	Loading	Drilling	Haulage
Temperature	Low	28.00	27.00	27.00	27.00
	High	36.00	34.00	35.00	35.00
	Average	**30.36**	**30.00**	**30.14**	**29.57**
RPM	Low	28.41	27.01	26.56	27.05
	High	38.78	34.45	55.02	62.05
	Average	**36.84**	**36.94**	**37.40**	**36.65**
So2	Low	1.30	2.01	1.06	1.98
	High	2.18	3.80	4.01	2.97
	Average	**1.74**	**2.60**	**2.04**	**2.42**
NoX	Low	3.98	4.09	3.90	3.46
	High	12.20	16.6	18.4	12.00
	Average	**7.64**	**8.80**	**9.23**	**7.41**

Based on the above data, it is observed that, the values are well within the permissible limits in all the location of the core zone. However the report of the same is enclosed as Annexure No. 9. (Note : for all the average value estimation, please see the enclosed Annexure No. 9)

BUFFER ZONE:

Similarly in the buffer zone, three monitoring location were identified to monitor the air quality accordingly it was monitored and the data so obtained has been compiled location wise to know the quality of air for the period August 2011 to January 2013. The below table shows the lowest, highest and the average values for the above said period:

Location		Bhandigudda village	Badenahal village	Gangur village
Temperature	Low	27.00	26.00	26.00
	High	31.00	32.00	31.00
	Average	**28.43**	**28.29**	**28.00**
RPM	Low	23.80	27.04	25.98
	High	28.11	29.05	32.10
	Average	**25.86**	**27.41**	**29.02**
So2	Low	0.75	1.05	1.05
	High	1.80	2.08	2.42
	Average	**1.23**	**1.61**	**1.61**
NoX	Low	1.97	2.08	1.90
	High	8.10	10.60	5.24
	Average	**4.51**	**5.02**	**4.84**

Based on the above data, it is observed that, the values are well within the permissible limits in all the location of the buffer zone. However the report of the same is enclosed as **Annexure No. 9. (Note** for all the average value estimation please see the enclosed **Annexure No. 9)**

WATER MONITORING:

Totally, nine locations (including both core and buffer zone) was identified to know the water quality in which two in buffer zone and seven in core zone. Below table shows the locations / stations monitored.

Sl. No.	Zone	Location / Station	Remarks
1.	Core Zone	Mine Pit water **	The values so obtained found within the permissible limit
2.		Mine Canteen Water	
3.	Buffer Zone	Bhandigudda Village	
4.		Bhadenal Village	
5.		Gangur village	
6.		Yermedoddi village	
7.		Dodderi village	
8.		Belegere Village	
9.		Balekatte village	

** accumulated during monsoon

CORE ZONE:

In the core zone totally two monitoring location were identified to monitor the water quality, accordingly it was monitored and the data so obtained has been compiled location wise to know the quality of water for the period August 2011 to January 2013. The below table shows the lowest, highest and the average values for the above said period:

Location		Mine pit water	Canteen water
Temperature	Low	27.00	26.00
	High	29.00	28.00
	Average	**27.71**	**27.14**
pH	Low	7.00	7.00
	High	7.40	7.50
	Average	**7.21**	**7.14**
TDS	Low	370.00	400.00
	High	410.00	420.00
	Average	**383.86**	**411.43**
Hardness	Low	180.00	190.00
	High	210.00	220.00
	Average	**200.00**	**193.57**
DO	Low	7.90	8.10
	High	10.20	10.00
	Average	**9.44**	**9.20**
Alkalanity	Low	140.00	145.00
	High	180.00	185.00
	Average	**159.57**	**163.57**
Chloride	Low	16.00	16.00
	High	24.00	22.00
	Average	**20.86**	**20.00**

Based on the above data, it is observed that the values are well within the permissible limits in all the locations of the core zone. However the report of the same is enclosed as **Annexure No. 9.** (Note : for all the average value estimation, please see the enclosed **Annexure No. 9**)

BUFFER ZONE:

Similarly in the buffer zone, seven monitoring location were identified to monitor the water quality, accordingly it was monitored and the data so obtained has been complied location wise to know the quality of water for the period August 2011 to January 2013. The below table shows the lowest, highest and the average values for the above said period.

Location		Bhani gudda	Baccena hal	Gangar	Vennae dodd	Dodderi	Baiegeri	Baic hatte
Temp- erature	Low	27.00	27.00	27.00	27.00	27.00	27.00	26.00
	High	29.00	28.30	28.00	25.00	29.00	28.00	29.00
	Average	**28.00**	**27.71**	**27.57**	**28.14**	**27.71**	**27.57**	**27.86**
pH	Low	7.20	7.10	7.20	7.10	7.20	7.00	7.23
	High	7.50	7.50	7.50	7.10	7.70	7.50	7.53
	Average	**7.40**	**7.23**	**7.36**	**7.17**	**7.47**	**7.23**	**7.34**
TDS	Low	380.00	360.30	410.00	410.00	410.00	390.00	410.00
	High	442.00	426.30	485.00	430.00	480.00	465.00	440.00
	Average	**412.43**	**381.14**	**397.29**	**425.00**	**443.57**	**432.14**	**429.29**
Hardness	Low	170.00	165.30	150.00	180.00	175.30	190.00	180.00
	High	230.00	220.30	250.00	260.00	280.00	260.00	280.00
	Average	**202.14**	**197.86**	**212.14**	**227.14**	**230.00**	**224.29**	**226.43**
DO	Low	8.30	8.30	7.00	8.90	8.10	8.70	8.30
	High	10.20	10.10	10.30	10.30	9.90	13.10	10.40
	Average	**9.10**	**9.38**	**9.34**	**9.56**	**9.09**	**9.24**	**31.36**
Chlo- rides	Low	125.00	130.00	130.00	125.00	140.00	135.00	125.00
	High	190.00	190.00	185.00	190.00	190.00	175.00	195.00
	Average	**167.86**	**163.57**	**160.71**	**165.00**	**168.57**	**159.29**	**164.29**
Fluoride	Low	8.00	8.00	9.00	11.00	0.00	10.00	17.00
	High	14.00	25.00	28.00	28.00	26.00	25.00	18.30
	Average	**14.29**	**12.71**	**12.86**	**14.57**	**14.57**	**15.43**	**15.86**

Based on the above data, it is observed that, the values are well within the permissible limits in all the locations of the buffer zone. However the report of the same is enclosed as Annexure No. 9. (Note for all the average value estimation, please see the enclosed Annexure No. 9)

NOISE MONITORING:

Totally, seven locations (including both core and buffer zone) were identified to know the noise levels in which three in buffer zone and four in core zone. Below table shows the locations / stations monitored.

Sl. No.	Zone	Location / Station	Code	Remarks
1	Buffer Zone	Bhandigudda village	NS – 1	The values so obtained found within the permissible limit.
2		Badanchal village	NS – 2	
3		Gangur village	NS – 3	
4	Core Zone	During operation	NS – 4	
5		Loading	NS – 5	
6		Haulage road	NS – 6	
7		Drilling	NS – 7	

CORE ZONE:

In the core zone totally four monitoring location were identified to know the noise levels, accordingly it was surveyed and the data so obtained has been complied location wise to know the noise level for the period August 2011 to January 2013. The below table shows the Minimum, Maximum and L equivalent values for the above said period

Location		Operation	Loading	Drilling	Haulage
Noise level	Min. (ave)	52.89	31.31	81.64	67.29
	Max. (ave)	64.29	85.29	87.79	79.39
	L. Eqn	**51.80**	**84.14**	**80.24**	**74.57**

Based on the above data, it is observed that the values are well within the permissible limits in all the locations of the core zone. However the report of the same is enclosed as **Annexure No. 9.** (Note for all the average value estimation, please see the enclosed **Annexure No. 9**).

BUFFER ZONE:

In the core zone totally three monitoring location were identified to know the noise levels accordingly it was surveyed and the data so obtained has been complied location wise to know the noise level for the period August 2011 to January 2013. The below table shows the Minimum, Maximum and L equivalent values for the above said period:

Location		Bhandigudda	Badrachal	Gangur
Noise level	Min. (ave)	51.86	48.0	50.75
	Max. (ave)	56.57	54.0	54.65
	L. Equ	46.14	45.5	47.14

Based on the above data, it is observed that, the values are well within the permissible limits in all the locations of the core zone. However the report of the same is enclosed as **Annexure No. 9**. (**Note**: for all the average value estimation, please see the enclosed **Annexure No. 9**). **Annexure No. 9**)

In line with above, Environmental Management Plan prepared for ensuing scheme of mining 2013 – 2018 and the same is enumerated in subsequent following pages. A key plan showing the Environmental Monitoring station is enclosed as **Plate No. 1**. An environmental Plan showing the environmental details and the monitoring station is enclosed as **Plate No. 17**. A report of Environment Monitoring carried out is enclosed as **Annexure No. 9**. The value so generated is within the permissible limits. And Environment Management Plan showing the year wise proposed environment protective measures such as plantation, dumping is enclosed as **Plate No. 18**.

10.0 ANY OTHER INFORMATION:

With due emphasis on environment and mineral conservation, the management will do the methodical & conscientious approach of mine development.

PART – C
PROGRESSIVE MINE CLOSURE PLAN

11.0 INTRODUCTION :

(a) **Name of the Lessee** : M/s. Steel Authority of India – Visvesvaraya Iron and Steel Ltd., - Bhadravathi

(b) **Location of the area** :

The said mine falls in the village Bhandigudda, under the survey No. 1 (part) of Bhadravathi Taluk, Shimoga district of karnataka State. This Mine lies towards east of northeast of Bhadravathy town and is at a distance of 18.0 Kms (Aerial distance). This mine is accessible by all weather roads from Bhadravathy town till the mine site. A key plan showing the lease area and its surrounding up to 10.0 kms is enclosed as **Plate No. 1** and location Map showing the lease area and its accessibility is enclosed as **Plate No. 2**. Detailed survey of the said mine with contour interval of 5.0 M along with the surface features is enclosed as **Plate No. 4**.

Apart from the above survey, G P S reading of all the boundary pillars has been recorded by WGS 84 datum the latitude and longitude of the are shown in below table,

Sl. No.	B P No.	Latitude (N)	Longitude (E)
1	A	13° 53' 32.0"	75° 50' 45.5"
2	B	13° 53' 09.3"	75° 50' 47.2"
3	C	13° 53' 07.9"	75° 50' 55.3"
4	D	13° 53' 09.0"	75° 51' 06.7"
5	E	13° 53' 08.2"	75° 51' 12.3"
6	F	13° 53' 11.9"	75° 51' 13.0"
7	G	13° 53' 11.0"	75° 51' 15.9"
8	H	13° 53' 09.5"	75° 51' 15.5"
9	I	13° 53' 01.2"	75° 51' 22.0"
10	J	13° 52' 58.2"	75° 51' 21.1"
11	K	13° 52' 56.1"	75° 51' 20.5"
12	L	13° 52' 53.5"	75° 51' 20.7"
13	M	13° 52' 50.8"	75° 51' 30.5"

Apart from the establishing and fixing above boundary pillars. Three Ground Control Points (GCP) has been fixed and linked with the boundary pillars. The details of G C Ps are shown below:

G C P No.	Details of G C P	Latitude (N)	Longitude (E)	Rela
1	Water Tank	13° 53' 04.4"	75° 30' 43.2"	704.50
2	Mariyamma temple	13° 53' 07.7"	75° 30' 34.9"	703.10
3	Taluk boundary pillar	13° 53' 11.5"	75° 31' 53.2"	868.97

BP – A lies towards 132° 30' with respect to north from G C P No 1 (Water tank) at a distance of 110.00 M and similarly it lies 118° 10' with respect to north from G C P No 2 (Temple) at a distance of 374.00 M.

Few photographs of the Mine working, boundary pillars and G C P are enclosed as **Plate No. 20, 21 & 22** respectively. All the GCP points are marked on Environment Plan and enclosed as Plate No. 17.

(c) **Extent of the area** : 40.12 Ha.

(d) **Type of lease area** : Forest

(e) **Present Land Use Pattern :**

Below table shows the present land use occupied by various activities

Unit in Ha.

Type of activity	Present Total
Area under mining	21.300
Storage for top soil	0.500
Overburden/ Dumps	2.000
Mineral Storage / Sub-grade stack	0.500
Infrastructure (Worksheps, Office)	0.500
Roads	0.750
Railways	
Green Belt	1.800
Tailing Pond	
Effluent Treatment Plant	
Mineral Separation Plant	
Township Area	
Others (to be specified) Canal	
Area for future use	12.770
Total	**40.120**

(f) **Method of Mining**

Conventional Opencast method is opted by mechanized mode of operation.

(g) **Mineral Processing** There is no mineral processing involved.

12.1 **Reason for Closure:**

Mainly the ROM generated in this mine will be utilized for their own captive Steel manufacturing industry. Hence no closure of mine within the ensuing scheme period. However due to certain unforeseen it needs to be closed as the guidelines / norm the closure plan will be submitted.

12.2 **Statutory obligations:**

Since the mine is active and it is operational, all the statutory formalities are completed. Since the Scheme of Mining period is completing on 31.03.2013, a fresh scheme of mining has been prepared and submitted for approval.

12.3 **Progressive Mine Closure Plan Preparation:**

The same R.Q.Ps. who has prepared the Scheme of Mining, has prepared progressive Mine Closure Plan. The detail of the R.Q.P is briefed under 'introduction' chapter vide para name of the R.Q.P preparing the mining plan

12.4 **MINE DESCRIPTION:**

12.5 GEOLOGY:

Regional Geology.

Basically the said area falls in Bababudan group which belong Dharwar supergroup of Precambrian age.

The central curvilinear greenstone belt of Karnataka running from south of Srirangapatna to north of Gadag. This belt is named as "Chitradurga Schist Belt", this synthesizes the stratigraphy and structure of Dharwar Super Group and it is subdivided as follows: (by Mr. Sreehariri at GSI mon vol 112 1981)

Group	Formations	Major lithology
	Hiriyur	Greywacke, Argillite with minor basic and Intermediate volcanics, Banded Ferruginous Cherts and polymictic conglomerate.
Dharwar Super Group	Ingaldhal	Basic volcanics with minor proportions of Acidic fractionates, thin beds pelagic sediments and sulphide / oxide facies of Iron formations
	Vanivilas	Banded Iron Formations, Manganese formations limestone Polymictic Conglomerates (Tuffs) and Quartzite
	Bababudan	Iron formations with local alterations of cross bedded quartzite, amygduloir basalt

The schist belt is divisible into three techno stratigraphic units. The lowest unit consists of Bababudan group, which deformed into a tightly appressed syncline, the middle unit comprises the various Ingaldhal formations and is deformed into an open fold system. The entire sequence except for the lowest part of the Bababudan group near the contact with the basement where the grade of Metamorphism attains the lower amphibolites facies. The lithological units in this Belt include Limestone, Green stones, quartz, amphibolites, shale and phyllite and which are metamorphosed igneous rocks.

The general strike of the Lithological formation follows the trend of the hillocks which is trending NNW – SSE and the dips are easterly vertical to sub – vertical.

Local Geology

Entire area is covered with thin cap of topsoil. However, the normal succession of litho units encountered from the surface studies and updating of the geological map annually.

Topsoil
Limestone
Shale / Phyllite
Alter intrusive (Dykes)

The ore formations in-general are associated with the Shale and Phyllite and clays on both the hanging and foot wall side. The geological formation as revealed from the field studies and exploration data is as follows.

General strike	: NNW – SSE with local variation of 10 to 15 degrees on either side
Dip	: moderate to sub vertical dips, general dips northerly
Thickness of	: True thickness of both limestone and Dolomite varies from 100 to 150 meters.
Type of ore	: Limestone which is hard in nature

A Geological plan showing the geological features is enclosed as **Plate No. 5.**

12.2 RESERVES:

Based on the UNFC, the deposit appears to be strata bound of regular habit being the geological axis as G1, Economic axis E 1 and the feasibility axis F1. The feasibility study of the report is enclosed as **Annexure No. 12.** No additional reserves have been established. But after updating the geology in detail and re-casting all the geological cross sections considering the available exploration data, techno – economic feasibility and all the technical and practical constraints, entire pit is re designed and the reserves are re estimated as per the U N F C guideline, where there is reduction in reserves to an extent of 2.319 **million tonnes.** The re-estimated reserve is furnished in the fore going paragraphs.

This area has been exhaustively explored by Department of Mines & Geology, Government of Karnataka and National Mineral Development Corporation Ltd., a public sector company way back in early sixties.

The details of the exploration carried out by the above said agencies are shown in below table.

Sl No.	Exploration agency	No of B H drilled	Cumulative meterage	Remarks.
1.	Department of Mines & Geology	39	2,434.19	Core drill
2.	National Mineral Development Corporation Ltd.	14	1,801.10	Core drill
	Total	53	4,235.29	

Totally 62 boreholes were drilled, after surrendering the area of **57.00 Ha** and retaining only **40.12 ha** for mining purpose, about 9 boreholes were gone outside the lease area. So only 53 core drill boreholes are considered for reserves estimation and to establish the geological structure.

The above said 53 boreholes are drilled at an interval of 200 X 200, 400.0 M X 400.0 M covering an area of 28.00 ha. Cross section were prepared at an interval of 100.0 M based on the available exploration data and the surface geological mapping coupled together, it was found that the Limestone body extends over an length of 900.0 M, width of the limestone is varying from 100.0 M to 500.0 M with an average width of 320.0 M. And the depth of the limestone is more than 100.0 M. The Bore Hole No. BGD 05, BGD12 & BGD 13 has proved the limestone deposit up a depth of 182.0 M, 335.0 M & 147.5 M respectively but for the estimation of the reserves 652.0 MRL (i.e up to a depth of 50.0 M from the bottom most of the pit) is considered. Though the limestone persists below, but only few boreholes are encountered, hence it is only considered up to 652.0 M MRL.

Method of estimation:

The estimation of ore reserves is made by conventional parallel cross section method using geological cross section. The geological cross sections are prepared at a regular interval of 100 M across the strike of the ore body. The area of individual litho units in the each and every cross section of respective benches is calculated separately. The volume between the cross section is arrived on the basis of the averaging the area of parallel cross section i. e. (S1 + S2) / 2) and multiplying sectional interval. Tonnage is arrived by multiply by its bulk density. For estimating the reserves only the core drill data are considered.

Categorization of Limestone:

While establishing the reserves, + 35 % CaO is considered as the cutoff grade and also as threshold value. Since the limestone is used for steel manufacturing industry only two type of limestone is categories and the parameters so considered for establishing the ore reserves are shown in below table.

Category / Grade	CaO in %	Fe_2O_3	MgO	SiO_2	Bulk Density	Recovery	Sec. Interval
High CaO	+45	3.0 % max	2.00 – 5.00	6.5 max	2.5	95.0 %	100.00
Low CaO	35 / -45%	–	2.00	12.0 max	2.5	95.0 %	100.00
Shale / Flyash					2.5		100.00
Iron Clay / Waste	Generated from the R O M about 5 %						

A Geological plan showing the different litho unit and its structural attitudes, drilled holes are marked and enclosed as **Plate No. 5**, and the geological cross sections are prepared at regular interval of 100 M and longitudinal section has been prepared along N: 950 (L – L') showing the different lithounits and limits of proved reserves which is enclosed as Plate No. 6 & 7. A typical borehole logs is enclosed as **Plate No. 8.**

Since the exploration has been carried out by way of core drilling in earlier stages by [illegible] & MECC the analysis report of the same is not available. However the studies so available are enclosed as **Annexure No. 7.** Two face samples of Limestone and one sample of waste dump analysed by N A B L laboratory is enclosed as **Annexure No. 8.**

Subsequent to the depleted reserves of 1,83,789 tonnes up to Feb - 2013, the balance reserves is 12.583 **million tonnes** including both proved and probable reserves which compared with the earlier reserves furnished in the last scheme of Mining.

We after updating the geology in detail and re-casting the all the geological cross sections considering the available exploration data, techno – economic feasibility and all the technical and practical constraints, and also considering the U. N F C guidelines that the drill grid up to 200 mts considering 1 1 1 and 200 – 400 grid as 1 2 2, entire pit was re designed and the reserves were re estimated. Where there is reduction in the reserves to an extent of **2.319 million tonnes** (including both proved and probable). The re-estimated reserve is furnished in the below table:

Reserves as on 01/04/2013					Unit :000' MT
Category	Limestone - R O M			Waste rock	UNFC Code
	High CaO	Low CaO	Total		
A. MINERAL RESERVES :					
Proved Mineral Reserves	5,332	2,919	8,251	1,950	1 1 1
Probable Mineral Reserves	2,013	-	2,013	100	1 2 2
Total (A)	**7,345**	**2,919**	**10,264**	**2,050**	
B. REMAINING RESOURCES :					
Feasibility	4,690	-	4,690	235	2 1
Pre-feasibility					2 2 2
Measured					3 3 1
Indicated					3 3 2
Inferred	4,277	2,926	7,203	374	3 3 3
Reconnaissance					3 3 4
Total (B)	**8,967**	**2,926**	**11,893**	**609**	
Total (A+B)	**16,312**	**5,845**	**22,157**	**2,659**	

Note: reserves furnished in the above table are as on 01.04.2013, this is by considering the depletion up to 31.03.2013 as per approved Scheme of mining.

Details of Section wise / category wise insitu ore reserves (proved) established is given below:

Unit :000' MT

Proved Mineral Reserves 1 1 1, as on Reserves as on 25/02/13				
Cross Sec. Between	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
E: 900 / E : 1000	817	181	998	371
E: 1000 / E : 1100	1,538	269	1,807	605
E: 1100 / E : 1200	1,337	323	1,660	550
E: 1200 / E : 1300	948	1,190	2,138	360
E: 1300 / E : 1400	479	936	1,435	132
E: 1400 / E : 1550	213	-	213	11
Total	5,332	2,919	8,251	1,950

The details of calculation of area, volume and tonnage of the above proved reserves is encloses as Annexure No. 13.

Details of level wise / category wise insitu ore reserves (proved) established is furnished below:

Unit :000' MT

Proved Mineral Reserves 1 1 1, as on Reserves as on 25/02/13				
Bench R L	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
730	107	-	107	61
724	89	14	103	199
718	80	114	194	212
712	63	176	239	242
706	205	222	427	231
700	454	355	809	224
694	830	390	1,220	219
688	694	396	1,090	129
682	741	466	1,207	108
676	581	326	907	87
670	506	228	734	81
664	392	84	476	58
658	348	76	424	49
652	242	72	314	38
Total	5,332	2,919	8,251	1,950

Details of Section wise / category wise insitu ore reserves (Probable) established is given below:

Unit :000' MT

Probable Mineral Reserves 1 2 2, as on Reserves as on 25/02/13				
Cross Sec. Between	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
E: 1300 / E : 1400	804		804	43
E: 1400 / E : 1550	1,209		1,209	57
Total	2,013	-	2,013	100

The details of calculation of area, volume and tonnage of the above proved reserves is encloses as Annexure No. 13.

Details of level wise / category wise insitu ore reserves (probable) established is furnished below:

Unit :000' MT

Probable Mineral Reserves 1 2 2, as on Reserves as on 25/02/13				
Bench R L	Limestone - R O M			Waste Rock
	High CaO	Low CaO	Total	
742	12		12	-
736	235		235	12
730	196		196	10
724	343		343	17
718	418		418	20
712	411		411	21
706	398		398	20
Total	2,013	-	2,013	100

12.3 MINING METHOD:

Taking into the consideration of geological parameters of the ore body and the geo-technical field observations made hereof, it is opted to work the mine by way of Mechanized mode and the method with conventional opencast mine with a bench system is adopted to work the deposit. The mining Pit is designed such that the height is about 6.00 M and the width is 30 M maintaining 31° pit slope along the footwall and the hanging wall side. These slopes are designed based on conditions of the strata and structural attitudes of both hanging wall and footwall formations. Faces are gradually advanced sideward lowering benches to win lower level ore.

Since there is drilling and blasting in this said mine, to excavate / extract the ore and waste initially, it will be drilled and blasted. Hydraulic excavators will be deployed for removal/winning/excavation of the ore and loading the same in tipper trucks. For transportation 10 tonne tippers will be used to stack yard, waste dumps and even up to Factory. Since the Limestone is hard in nature the drilling and blasting will be restricted only for this hard strata. While the wastes are soft in nature the same will be retrieved with the help of the excavators. The ore and waste will be exploited separately. The waste will be carried to the waste dump and it will be disposed off. The ore will be carried to the to the Cement factory for the manufacture of the cement. The roads with in the pit will be maintained at 1 : 16 gradient, where ever it is not possible to maintain 1 : 16 due to practical constraints it will be maintained at 1 : 12.

Drilling and Blasting:

Since the mining is proposed to work by mechanized and the benches are kept 6.0 M height and the limestone is a material which is hard to very hard in nature it requires the drilling and blasting to exploit the same. On an average about 300 – 350 tonnes of material required to be drilled and blast.

The broad blasting parameters are determined for the blasting pattern and blast design, which are as follows

Blast hole diameter is normally 115 mm and the depth of the hole is 7.0 meters inclusive of sub grade drilling of 1.0 meters to avoid toe formation. Blasting pattern is generally square or staggered with burden ranging from 3.0 to 3.5 meters and spacing of 3.5 to 4.0 meters. Usually single / double row of holes is blasted along free face to achieve optimum powder factor, best fragmentation and minimized adverse impacts on account of blasting. Maximum numbers of holes will be blasted at a time in a round are generally limited to 15 to 20 with normal delay detonators to mitigate adverse impacts such as air blast, throw and the ground vibration. Holes are electrically detonated using electric detonators.

ANFO types of explosives are used for blasting with 20 to 25 percent, proportion of primer/ booster cartridges and rest as column charge. About 20 kgs of explosives are loaded in 115 mm diameter holes and powder factor ranging between 6 to 8 tons per kgs of explosives is achieved.

12.4 MINEARL BENEFICIATION:

No Beneficiation plant exists or proposed and as of date. But lessee intends to put up a mobile Crushing cum Screening plant.

13.0 REVIEW OF IMPLEMENTATION OF MINING PLAN / SCHEME OF MINING.

13.1 **Name of Mine** : Bhandigudda Limestone Mine

13.2 **Particulars of the Approved Mining Plan / Scheme.**

Presently this lease is having a valid Scheme of Mining prepared for the year 08 -09 to 2012 – 13 and the same was approved vide your office letter No. MS / SMG / Lst – 112 – 82 dated 27.06.2008 a copy of the said approval letter is enclosed as **Annexure No. 2.**

13.3 **Date of commencement of Mining Operation.**

Subsequent to the grant of the mining lease in the year 1963

13.4 **Review of compliance Position of Mining Plan / Scheme**

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

The deficiencies which were pointed out were rectified prior to approval of the Scheme of Mining

13.4 B **Review of compliance Position of Salient features of the Mining Plan/Scheme on chapter wise basis bringing out marked deviations, if any, and justifications/ reasons thereof.**

i Exploration:

No exploration was proposed during the last scheme period from 2008 – 09 to 2012 -13, as the exploration which was carried out by DMG and by NMDC was more sufficient. A list of boreholes drilled by DMG and NMDC is enclosed as **Annexure No. 6** and few typical logs of the same is enclosed as **Plate No. 8**

5. Mine Development & Exploitation

Proposed and achieved quantities of production and development are given in below table

Year	Development - Qty : tonnes		
	Proposed	Achieved	% of variation
2008 – 09	5,000	Nil	-
2009 – 10	Nil	10,000	+ 100.00
2010 – 11	5,000	Nil	-
2011 – 12	Nil	Nil	100.00
2012 – 13 **	5,000	Nil	- 100.00
Total	15,000	10,000	- 33.33

** indicates till Feb 2013.

During the last scheme, it was proposed to handle 15,000 tonnes of waste, against only 10,000 tonnes has been handled. This was mainly due to the less production when compared with the proposals

During the last scheme period, there was no specified location of dumping the waste, but it was only discussed it will be dumped outside the main pit. Accordingly it was dumped outside the pit. The waste was dumped on the existing waste dump which lies towards west of the main pit i.e between the co – ordinate and ordinate E : 800 to E : 1000 and N 950 to N 970 by increasing approximately 2.00 mts height.

Year	R O M - Production - Qty : tonnes		
	Proposed	Achieved	% of variation
2008 – 09	1,01,000	34,808	- 65.54
2009 – 10	1,01,000	48,326	- 52.15
2010 – 11	1,01,000	27,988	- 72.29
2011 – 12	1,01,000	52,697	- 47.85
2012 – 13 **	1,01,000	20,000	- 83.83
Total	5,05,000	1,83,789	- 64.00

** indicates till Feb 2013.

Basically, this limestone mine is a captive mine for the Steel industry situated at Bhadravathi during the last above five years, there was less production, this is mainly due the requirement of the captive industry. As there was no sufficient raw material like iron ore to feed to the plant. Hence there is a less in productions.

During the last scheme period, the production was proposed mainly from the main pit / quarry accordingly the production was achieved from main pit only.

Review of plantation details :

Year	Plantation - Qty : in Nos.		
	Proposed	Achieved	Location
2008 – 09	2,000	2,000	Within the lease opposite to Canteen adjacent to road
2009 – 10	2,000	1,100	
2010 – 11	2,500	2,500	
2011 – 12	2,500	2,500	
2012 – 13 **	2,500	NIL	
Total	11,500	8,100	

** indicates till Feb, 2013

1.80 Ha has been covered under plantation and the survival rate is about 60 %

Review of Environmental monitoring Details

Regular monitoring / survey for air, noise, water, soil, in core zone & buffer zone the report of the same is enclosed as **Annexure No. 9.** And the details are discussed in the above paragraph **Environment Management Plan vide Para 9.0**

Land Reclamation & Rehabilitation.

In the last approval of scheme of mining along with the PMCP, it was proposed to retain the pit as a water pond, which will cater the wild inhabitants, agriculture / sericulture purpose. Since the deposit is not totally exhausted, so presently it cannot be created as a pond. This will be taken only at the conceptual stage

Waste Management.

About 10,000 tonnes of waste was generated against proposed 15,000 tonnes. The generated waste was dumped in the area earmarked for the purpose. This was systematically dumped in a plain wise manner

13.4 C **Review of Compliance Position of conditions and stipulations imposed, if any, while approving Mining plan/Scheme In case non-compliance, partial compliance, detailed justification reasons thereof may be furnished along with proposal for compliance in ensuing period.**

There are no any special conditions and stipulation was imposed while approving the Scheme of Mining. The conditions so imposed is the general condition, a copy of the same is enclosed as **Annexure No. 2.** However the some of the imposed conditions are detailed below:

1. A copy of EIA / EMP report, approved by MoEF, New Delhi, should be submitted to this office as well as Regional Controller of Mines, Indian Bureau of Mines, Bangalore, within one month of its approval along with the copy of the approval letter.

2. The company shall establish environment monitoring cell. Environment monitoring cell of the company shall continue monitoring ambient air quality, dust fall rate, water quality, soil sample analysis and noise level measurements on various stations established for the purpose both in the core and buffer zone, as per the department of the Environment guidelines and keeping in view IBM's circular 3 / 92, season wise every year or by engaging preferably the services of an Environmental laboratory by MoEF approved / CPCB. The data so generated shall be maintained in a bound page register kept for the purpose and the same shall be made available to the inspecting officer on demand.

3. The validity period of the financial assurance should be renewed before the expiry of the same and should be submitted to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, under intimation to this office.

4. A yearly report shall be submitted to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore before 1st of every setting forth the extent of protective and rehabilitative works carried out as envisaged in the approved mine closure plan.

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

There was no inspection during the last five years.

13.4 E **Any other points requiring attention in the interest of proper mine design, Development, Conservation and Environment & Ecology of the area.**

With due conservation of mineral, management is interested to operate the mine, very scientific & systematic method of mining. Moreover to the utilize the mineral resources very much conservative, the limestone is now classified in to two parts one is High CaO where CaO is more than 45 % while the other is Low CaO where CaO varies from 35% to 45% in which sub grade and low grade is also included. Since the material is used for a captive steel industry, the low CaO will be blended with the High CaO with the required proportion based on the generation of the material and will be transported to the captive Steel Industry which is situated at Bhadravathi.

14.0 **Progressive Mine closure Plan**

14.1 **Mined out land.**

As on date the mined out land is 21.300 ha, presently no proposal can be given for reclamation and rehabilitation measures in the mine out land, because the entire mined out pit is still active. However, the details of the present & up to ensuing Scheme period are tabulated in below table.

Unit in Ha.

Type of activity	Present Total	Scheme Total
Area under mining	21.300	21.300
Storage for top soil	0.500	0.500
Overburden/ Dumps	2.000	2.750
Mineral storage / Sub-grade stack	0.500	0.500
Infrastructure (Workshops, Office)	0.500	0.500
Roads	0.750	0.750
Railways		
Green Belt / plantation	1.800	9.800
Tailing Pond		
Effluent Treatment Plant /Factory		
Mineral Beneficiation Plant		
Township Area		
Others (to be specified) : Canal		
Area for future use	12.770	8.020
Total	**40.120**	**40.120**

14.2 Water Quality Management

Surface Water: There are no surface water bodies within the lease area.

Ground water:

Water sources in the area are Ground water and rain water. The general ground water table in this area 50 – 60 M below the general ground level and more over the mining activities are confined above the ground water table. Hence no hydrogeology studies are proposed. However in due course of time, in any case if happens to touch the ground water, the hydro-geological studies will be continued to know the impact of the ground water on mining activity.

14.3 Air Quality management

The Air Quality management in present ensuing Scheme of Mining period is briefly discussed under the chapter Air Quality headed by Environment Management Plan.

14.4 Waste Management

The yearly generation of waste such as topsoil, shales and phyllites and the intercalated waste generated from the Limestone is mentioned is furnished in below table: -

			Qty: MT.
Year	Topsoil	Waste	Total
1st year 13 – 14	-	71,000	71,000
2nd year 14 – 15	-	75,000	75,000
3rd year 15 – 16	-	5,000	5,000
4th year 16 – 17	-	5,000	5,000
5th year 17 – 18	-	5,000	5,000
Total	**-**	**1,61,000**	**1,61,000**

During the ensuing scheme period the production and development are proposed within the broken up mines, hence no topsoil is generated.

Year wise locations of dumping blocks with respective co-ordinates / ordinates and RLs are shown in table below.

Year	YEAR WISE DUMPING BLOCKS FOR WASTE		
	Dump	Ordinates / Co – ordinates	Extents in RLs.
1st year 13 – 14	North	N : 1050 - N : 1130 & E : 790 - E : 880	0.350 Ha. 710 - 720
2nd year 14 – 15	Western	N : 1070 N : 1130 & E : 740 E : 880	0.450 Ha. 710 - 730
3rd year 15 – 16	- do -	N : 1070 to N : 1150 & E : 815 to E : 950	Over the same dump 720 - 730
4th year 16 – 17	- do -		
5th year 17 – 18	- do -		

The location of said dump is shown on the respective production & plan enclosed as **Plate No. 9 to 13** and a cross section showing the dump disposition is marked on the dump section and enclosed as **Plate No. 15.**

During the scheme period present existing northwestern dump which lies within the lease area will be laterally extended by occupying an additional area of **0.750 ha.** This area can accommodate about 1,70,000 tonnes of waste. The dumping will be done up to 720 MRL where the average height will be 10 M. This area is sufficient for the first two year of the ensuing scheme period. The waste generating during the next three years will be dumped over the said dump up to 730 MRL after leaving 10 – 15 M barrier from the edge of the dump.

The waste such as clay, shale and phyllite, will be dumped in the area earmarked for the purpose such that the height of the dump will not exceed 20.0 M. Initially the dumping will be done up to 720 MRL (10.0 M height) there after the same dump will be increased by additional height of 10.0 M (up to 730.0 MRL), terracing and pitching will be done at an interval of 10.0 M. The details of scheme of dumping are discussed in the subsequent paragraphs.

The waste generated during the scheme period will be dumped within the lease area, earmarked for the purpose. The land profile chosen for the dumping is plateau with minor undulation, initially it will be dumped up to 720 MRL (10.0 M height) there after the same dump will be increased by additional height of 10.0 M (up to 730.0 MRL), terracing and pitching will be done at an interval of 10.0 M. The buildup of dumps on yearly basis is indicated in **Plate No. 9 to 13**. And a Cross Section showing the year wise Dump disposition is shown in **Plate No. 15.**

Waste generated at the mine is transported to dumping site by 16 ton capacity tippers. A wheel loader is continuously provided to level waste material unloaded by tipper Trucks and spread laterally in area earmarked. Continuous movements of tipper trucks while unloading consolidate the ground. Water is regularly sprinkled in roads over the dumps to control the blowing dust. Thus, with dozing, end tipping and consolidation dump is built up in stages.

While building up, dumps are properly graded and terraced with a provision of contour drainage. Terracing is always accompanied with plantation for stabilization of terraced slopes. As far as possible, dumps are created in low-lying areas. It is always ensured that dump height does not exceed 30.0 M or tallest growing trees of the region. Dump slopes are suitably protected from any environmental damages, providing all the protective measures described as below.

Year wise proposed plantation for the ensuing Scheme of Mining is given in below table

Years	No. of saplings proposed to plant	Area in Ha. Proposed to be covered	Location / Remark
1st year 13 – 14	2,250	0.75	
2nd year 14 – 15	2,250	0.75	
3rd year 15 – 16	1,500	0.50	Near office and
4th year 16 – 17	3,000	1.00	statutory building
5th year 17 – 18	3,000	1.00	
Gr. Total	**12,000**	**4.00**	

Plantation will be carried out by seeking guidance from the Forest and any concerned Department. Preferably local species will be planted. Due care will be taken to protect the afforested area from fire, pests and cattle's. For healthy growth of the saplings, proper dosage of fertilizer / manuring will be provided, and water will be provided as and when required. Apart from the plantation, to protect the erosion due to monsoon and surface run off the protective measures such as trenching and retention wall are constructed. The year wise proposed protective measure for the ensuing Scheme period is given in below table

Years	Trench			Retention wall			Location / Remark
	L	W	D	L	W	H	
1st year 13 – 14	250	0.50	0.50	250	0.75	1.00	Dump toe
2nd year 14 – 15	200	0.50	0.50	200	0.75	1.00	- do -
3rd year 15 – 16	150	0.50	0.50	150	0.75	1.00	- do -
4th year 16 – 17	150	0.50	0.50	150	0.75	1.00	- do -
5th year 17 – 18	150	0.50	0.50	150	0.75	1.00	- do -
Gr. Total	**900**	**0.50**	**0.50**	**900**	**0.50**	**0.50**	- do -

14.5 **Top Soil Management**

Area proposed for the mining activity is more or less in the exposed pit, hence no topsoil is anticipated.

14.6 **Tailing Dam Management** : NOT APPLICABLE.

14.7 **Infrastructure.** Since the mine is operation from past four decades, the lessee Provides all the required infrastructure facilities.

14.8 **Disposal of Mining Machinery.**

At present there is no any disposal of any mining machineries, however the lessee company is a Public Sector Company. In any case if the same needs to be disposed off prior to the shelf time of the mining machineries, it will be transferred to the other mining unit operated by the same company.

14.9 **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 31 degree and providing the safety equipment like safety shoe, Hand gloves and etc, to employees. As a part of security, security guard will be deployed for watch and ward round the clock.

14.10 **Disaster Management and Risk Assessment**

Since the mine is under operation from past more than few decades, as of now no disaster is visualized. The disaster and the risk may occur due to natural calamity such as earthquake, landslide, collapse and etc. However in such cases the emergency services required for help like Police station, Fire station, Hospital, Ambulance services and its contact Nos., are available with the Mines Manager. And also the emergency services Nos. are displayed on the notice board at important places.

14.11 **Care and Maintenance during Temporary Discontinuance**

Lessee proposes to work continuously, till the conceptual stage as such there is no temporary discontinuance of the mine. However due to unforeseen situation if mines happens to be a temporary discontinuance due to strike, lockout & any order passed by the government, court and etc, lessee will take due care of mines by providing the fencing the pit, deploying the security guards for watch and ward of the mine. Payment will be made to all the employees as per the statute and providing medical and other facilities. More so, it is a public sector company, all the legal and statutory formalities will be done accordingly.

15.0 Economic Repercussions of Closure of Mine and Man Power Retrenchments.

Manpower retrenchment, compensation to be given, socio-economic repercussions and remedial measures consequent to the closure of mines should be described, specifically stating the following.

Number of local residents are employed in the mine, status of the continuation of family occupation and scope of joining the occupation back.

Total number of employees employed in this mine is 27. Almost all the employees are employed locally, but for few technical personnel such as Mines manager, Geologist, Surveyor and etc.,

Compensation given or to be given to the employees connecting with sustenance of himself and their family members.

Since this mine is operated as a captive mine, the captive industry has been in operation since from 1923 (where as SAIL took over this in the year 1998). Hence the closure of the mine will not arise during the scheme period, however due to certain constraints if happen to be closed, the employee will be paid their compensation as per the laws and regulations. And if any financial / moral support is required the company will extend their co operation in this regard. When the mine put back into operation the same employees will be employed back.

Satellite occupations connected to the mining industry - number of persons engaged therein - continuance of such business after mine closes.

Most of the satellite occupations connected to the mining industry are not affected due to closure or otherwise of the mine. Managerial, technical & supervisory staff is likely to get employment within a reasonable period. Local labour can support them by joining other members of family in their traditional occupation. Hired equipment/ trucks easily get alternate engagement. However it will be applicable at the time of final mine closure plan.

Continued engagement of employees in the rehabilitated status of mining lease area and any other remnant activities.

Security & essential service people will continue to be employed for a purely short term/ temporary closure. Where operations are discontinued for longer period, it is not viable to continue with their employment and so these will be reduced to minimum, counseling will be extended for their rehabilitation. However this is applicable at the time of final mine closure plan.

Envisaged repercussions on the expectation of the society around due to closure of mines.

There will be some effect on their economy, communication and transportation but still their difficulties will be manageable to large extent. Compensation, socio-economic repercussions and remedial measure consequent to closure will be discussed at the time of submission of final mine closure plan.

16.0 Time Scheduling for abandonment.

Since the mine is active till the conceptual stage / life of the mine hence the abandonment is not applicable at this stage. However the partial abandonment like plantation, reclamation and other details in a tabular form for each and individual year wise are furnished in the subsequent para.

17.0 Abandonment cost.

The abandonment cost for such as plantation, construction of rubble wall, and etc are furnished in the prescribed Forms and enclosed as **Annexure No. 15 to 19.**

18.0 Financial Assurance.

Area for the Financial Assurance is calculated as per the CCOM's circular No. 4 / 2006, till the end of the Ensuing Mining Plan period and the details of land use considered is shown in below table

Sl. No.	Type of land use	Area of Land to use (in Ha)			The area is considered as fully reclaimed and rehabilitated	Net area considered for calculation
		Area put to use at start of Plan	Additional Requirement during plan period	Total		
		A	B	C = (A + B)	D	E = (C – D)
1	Area under mining	11.900		11.900		11.900
2	Dumps for top soil	0.500		0.500		0.500
3	Overburden dumps	2.000	0.750	2.750		2.750
4	Mineral storage	0.500		0.500		0.500
5	Infrastructure	0.500		0.500		0.500
6	Roads	0.750		0.750		0.750
7	Railways					
8	Green Belt	1.000	4.000	5.000		5.0000
9	Tailing pond					
10	Effluent treatment plant					
11	Beneficiation Plant					
12	Township area existing					
13	Others to be specified)					
	Area remains undisturbed	12.770			8.020	
	Total	**40.120**			**8.020**	**32.100**

The total area under utilization till the end of the Scheme of Mining Period: **32.100** Ha

Financial assurance @ Rs. 25.000/- per hector.

32.100 Ha X Rs. 25,000/ per ha. **Rs. 8.02,500/-**

The financial assurance being the sum of Rs. Eight Lakh Two Thousand Five Hundred Only.

The financial assurance in the form of bank guarantee submitted during the last approval of the scheme of mining over an amount of **Rs. 9,28,000/-** (The sum of Rs. Nine Lakh Twenty Eight Thousand) could not be renewed bankers constraints hence for the same amount fresh bank guarantee has been obtained and submitted to the Regional office, a copy of the bank guarantee and acknowledgement of the submission is enclosed herewith as **Annexure No. 20.** And F.M.C.P to this effect showing the land use is enclosed as **Plate No. 19.** Though the land use is less compared with the last scheme of mining, the last bank guarantee is only submitted.

19.0 **Certificates:** The required certificates are enclosed.

20.0 **Plan and sections:**

The required plans and sections are enclosed and the specific references are made in the relevant chapter as applicable

KANTHARAJ. K
RQP / GOA / 130 / 2006 / A

RAMACHANDRA. K. T.
RQP / BNG / 040 / 88 / A

This Scheme of Mining is approved subject to the conditions / stipulations indicated in the Scheme of Mining approval letter No. KAR/SOM/Bhandiguda/Lst-197-12 Date 25-6-13

25/6/13
भारत नियंत्रक (ए.जी.)
Controller of Mines (S. Z.)
भारतीय खान ब्यूरो
Indian Bureau of Mines
बेंगलूर / BANGALORE

ANNEXURES

ANNEXURE NO 1

ORIGINAL

ಕರ್ನಾಟಕ ಸರ್ಕಾರ
GOVERNMENT OF KARNATAKA
ಗಣಿ ಮತ್ತು ಭೂವಿಜ್ಞಾನ ಇಲಾಖೆ
Department of Mines and Geology

ಗಣಿ ಗುತ್ತಿಗೆ
MINING LEASE

Registered No. ML No. 2160

Name of Lessee/s Visvesvaraya Iron & Steel Plant (SAIL)

Date of Grant Renewal 27.09.2002 Date of Exp. 26.09.2012
Orig. Notification No. GAE 45 MGL 2001 Dated 16.5.2001

Period 20 (Twenty years) w.e.f. 01.11.2002

K.T.RAMACHANDRA
RQP/BNG/010/88/A

KANTHARAJ K.
RQP/GOA/130/2003/A

Lease 1927

GOVERNMENT OF KARNATAKA

MINING LEASE

This indenture made this ... day of ... (Month) ... between the Government of Karnataka (Hereinafter referred to as the "State Government" which expression shall, where the context so admits be deemed to include its successors and assigns) of the one part and when the lessee/lessees is or individual,

(a) When the lessee is an individual :

... (Name of person with address and occupation) hereinafter referred as "the lessee" which expression shall, where the context so admits, be deemed to include his heirs, executors, administrators, representative and permitted assigns),

(b) When the lessees are more than one individual :

... (Name of person with address and occupation) and ... (Name of person with address and occupation) hereinafter referred to as "the lessee which expression of all, where the context so admits, be deemed to include their respective heirs, executors, administrators, representatives and their permitted assigns),

(c) When the lessees is a registered firm :

... (Name and address of Partners) all of ... son of ... all carrying on business in partnership under the firm name and style of ... (Name of the firm) registered under Indian Partnership Act 1932 (9 of 1932) and having their registered office at ... in the town of ... hereinafter referred to as "the lessee" which expression where the context so admits be deemed to include all the partners of the said firm their representatives, heirs, executors, administrators and permitted assigns),

When the lessee is a registered company :

Visvesvaraya Iron and Steel plant / SAIL Bhadravathi (Post Office) Bhadravathi Taluk Shimoga Dist ... (Name of Company)

K MAHALINGAM
Asst General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT

Lease 1927

a company registered under Companies Act 1956 (Act 1 of 1956) and having its registered office at ... (Address) (hereinafter referred to as "the lessee" which expression shall where the context so admits be deemed to include its successors and permitted assigns) of the other part.

WHEREAS the lessee/lessees has have applied to State Government in accordance with the Mineral Concession Rules 1960 (hereinafter referred to as the said Rules) for a mining lease in respect of the lands described in PART I of the Schedule hereunder written and has/have deposited with the State Government the sum of Rs 10000-00 as security and the sum of Rs 500-00 towards expenses incurred in connection with the preliminary examination for a mining lease and whereas the lessee is in possession of a valid certificate of approved income tax clearance certificate (and WHEREAS the Central Government has approved the grant of this lease").

WITNESSETH that in consideration of the rents and royalties, covenants and agreements by and in these presents and the schedule hereunder written reserved and contained on the part of the lessee / lessees" to be paid, observed and performed, the State Government (with the approval of the Central Government)* hereby grants and demises upto the said lessees

All those the mines beds veins, seams of LIME STONE (state the mineral or minerals) (hereinafter and in the scheduled refers to as the minerals) situated, lying and being in or under the lands which are referred to in Part I the said schedule, together with the liberties, powers and privileges to be exercised enjoyed in connection herewith which are mentioned in PART II of the schedule subject restrictions and conditions as to the exercise and enjoyment of such liberties, powers privileges which are mentioned in PART III of the said schedule EXCEPT and reserved out are the demise up to the State Government the liberties, powers and privileges mentioned in PART IV of the said Schedule TO HOLD the premises hereby granted demised up to "the lessees/licensees from the ... for the term of 30 (Thirty years) upto 31-04-2009 hence next ensure YIELDING AND PAYING of up to the State Government the sum rents and royalties mentioned in PART V of the said Schedule at the respective times therein specified subject to the provisions contained in PART VI of the Schedule and the lessee/lessees hereby/covenant/covenants with the State Government as in PART VII of said Schedule expressed and the State Government hereby covenants with the lessee/lessees in PART VII of the Schedule is expressed AND it is hereby mutually agreed between the parties here to as in PART X of the said Schedule in expressed

IN WITNESS WHERE OF these presents have been executed in manner hereinafter appearing the day and year first above written.

The Schedule above referred to.

K MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577 301.

2

PART I

THE AREA OF THIS LEASE

LOCATION AND AREA OF THE LEASE :

All that tract of land situated at [illegible] area of about [illegible] in Pargana [illegible] the Registration District of Bardhaman Taluk [illegible] Sub district Srirampur [illegible] and Distt at [illegible] bearing Cadastral Survey Nos [illegible] containing an area of [illegible] or thereabouts delineated in plan hereto annexed and there on coloured [illegible] and bounded as follows:

On the North by Part of Sy no 1 Bhandigudda Village

On the South by —

On the East by —

and

On the West by Part of Sy no 1 Bhandigudda Village

hereinafter referred to the said lands

PART II

LIBERTIES, POWERS AND PRIVILEGES TO BE EXERCISED AND ENJOYED BY

THE LESSEE/LESSEES SUBJECT TO THE RESTRICTIONS AND CONDITIONS IN PART III

1. To enter upon land and search for mine work etc.,

Liberty and power at all times during the term demised to enter upon said lands and to search for, mine, bore, dig, drill for win, work, dress, process, convert, carry away and dispose of the said mineral/minerals.

2. To sink, drive and make pits shafts and inclines etc.,

Liberty and power for or in connection with any of the purposes mentioned in this part to sink, drive, make, maintain and use in the said lands any pits, shafts, inclines, drifts, levels, water ways, airways and other works (and to use, maintain, deepen or extend any existing works of the like nature in the said lands).

[illegible]
Asst. General Manager (Admn.) & Dy.
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
Bhadravati - 577301.

3. To bring and use machinery, agricultural, etc.

Liberty and power for or in connection with any of the purposes mentioned in to erect, construct and use [illegible] or under the said lands and engines, machinery, plant, [illegible] buildings, [illegible] bungalows, [illegible] and other works and conveniences as may be necessary for the purposes of this lease.

4. To make roads, ways and use existing roads and ways.

Liberty and power for or in connection with any of the purposes mentioned in this part to make any roads, railways, tramways and other ways in or over the said lands and to use, maintain and repair the same with or without horses, cattle wagons, locomotives or other vehicles over the same (or any existing tramways, railways road and other ways in or over the said lands, on such conditions may be agreed to.

5. To get building and road materials etc.,

5. Liberty and powers for or in connection with any of the purposes mentioned in this par to quarry and get, ordinary building stone and gravel and other building and road materials (except that of specified minor minerals) and ordinary clay and to use and manufacture the same and to manufacture with ordinary clay into bricks or tiles and to use such bricks or tiles not to sell any such material bricks or tiles.

6. To use waters from streams etc.,

Liberty and power for or in connection with any of the purposes mentioned in this part but subject to the rights of any existing or future lessees and with the written permission of the Deputy Commissioner to appropriate and use water from any stream, water-courses, springs or other sources in or upon the said lands and divert set up or use any such stream or water-course, culverts, drains or reservoirs but not as to deprive any cultivated lands, villages bathing, or watering places for livestock of a reasonable supply of water as before necessitated nor in any way to foul or pollute any streams or springs. Provided that the lessee/lessees shall not interfere with the navigation in any navigable streams nor shall divert such stream with out the previous written permission of the State Government.

7. To use and for stacking, heaping or depositing purposes.

Liberty and Power to enter upon and use a sufficient part of surface of said lands for the purpose of stacking, heaping thereon any produce of the mines or works carried on and any equipment, earth and materials and substances dug or raised under the liberties and powers mentioned in this part.

[illegible]
Asst. [illegible]

4. Beneficiation and carrying away.

Liberty and power to enter upon and use a sufficient part of the said lands as may be necessary for beneficiating any ore produced from the said lands and to carry away such beneficiated ore.

5. To make coke (to be used in case of coal only):

Liberty and power upon the said lands to convert into coke any coal thus produced from the said lands and to carry away such coke.

6. To clear brushwood and to fell and utilise trees, etc.,

Liberty and power for or in connection with any of the purpose mentioned in this part and subject to the existing rights of others and save as provided in clause 3 of part III of this Schedule to clear undergrowth and brushwood and to fell and utilise any trees or timber standing or found on the said lands provided that the State Government may ask the lessee/lessees to pay for any trees or timber felled and utilised by him/them at the rates specified by the Deputy Commissioner or the State Government.

PART III

RESTRICTIONS AND CONDITIONS AS TO THE EXERCISE OF THE LIBERTIES, POWERS AND PRIVILEGES IN PART II.

1. No building etc. upon certain places.

No building or thing shall be erected, set up, placed and no surface operations shall be carried on in or upon any public pleasure ground, burning or burial ground or place held sacred by any class of persons or any house or village site, public road or other place which the State Government may determine as public ground nor in such manner as to injure or prejudicially affect any buildings, work, property or rights of other persons and no land shall be used for surface operations which is already occupied by persons other than the State Government for works or purposes not included in this lease. The lessee/lessees shall not also interfere with any right of way, well or tank.

2. Permission for surface operations in a land not already in use.

Before using for surface operations any land which has not already been used for such operations the lessee/lessees shall give to the Deputy Commissioner of the district two calendar months previous notice in writing specifying the name or other description of the situation and the extent of the land proposed to be so used and the purpose for which the same is required and the said land shall not be so used if objection is raised by the Deputy Commissioner within two months after the receipt by him of such notice unless the objections so stated shall on reference to the State Government be annulled or waived.

3. To cut trees in unreserved lands.

The lessee/lessees shall not, without the express sanction of the Deputy Commissioner and save as hereinafter provided cut down any timber or trees on the said lands but may with such sanction clear away the whole growth of underwood or undergrowth which interferes with the operations of himself and his/their servants. The Deputy Commissioner or the State Government may require the lessee/lessees to pay for any trees or timber so cut and utilised by him at the rates specified by the Deputy Commissioner or the State Government.

4. To enter upon reserved forest.

Notwithstanding anything in this Schedule contained the lessee/lessees shall not enter upon any reserved forest included in the said lands without Previous sanction in writing of the District Forest Officer nor fell, cut and use any timber or trees without obtaining the sanction in writing of that Officer nor otherwise than in accordance with such conditions as the State Government may prescribe.

(4A) The lessee/lessees shall not fell any trees in any forest area converted by this lease without reasonable notice to the Forest Officer and except in accordance with the provisions of the law relating to forests for the time being in force.

5. No mining operations within 50 meters of public works etc.,

The lessee/lessees shall not work or carry on or allow to be worked or carried on any mining operations at or to any point within a distance of 50 metres any railways [except with the previous written permission of the Railway Administration concerned] or under or beneath any ropeway or any ropeway trestle or station except under and in accordance with the permission of the authority owning the rope way or from any reservoir, canal or other public works such as public roads and buildings or inhabited site except with the previous written permission of the Deputy Commissioner or any other officer authorised by the State Government in this behalf and otherwise than in accordance with such instructions, restrictions and conditions and either general or special which may be attached to such permission. The said distances of 50 metres or 200 metres shall be measured in the case of railway, reservoir or canal horizontally from the outer toe of the bank or the outer edge of the cutting as the case may be and of building horizontally from the plinth thereof. In the case of village roads no working shall be carried on within the previous permission of the Deputy Commissioner or any other officer duly authorised by the State Government in this behalf and otherwise than in accordance with such directions restrictions and additions either general or special which may be attached to such permission. [No.1(51/65-Mll dated.26-2-62]

Explanation: For the purposes of this clause, the expression 'Railway Administration' shall have the same meaning as it is defined to have in the Indian Railway Act, 1890, in Clause 6 of Section 3 of the Act, 'Public Road' shall mean a road which has been constructed by artificially surfaced as district from a trace resulting from repeated use. Village road will include any trace shown in the revenue records as village road.

5. Facilities for adjoining Government licensees and lessees.

The lessee/lessees shall allow existing and future holders of Government licenses or leases over any land which is comprised in or adjoins or is reached by the land held by the lessee/lessees reasonable facilities of access thereto.

PROVIDED THAT no substantial hindrance or interference shall be caused by such holders of licenses or leases to the operations of the lessee/lessees under these presents and the lessee/lessees shall be entitled to compensation as may be mutually agreed upon between the lessee/lessees under these presents and fair compensation (as may be mutually agreed upon or in the event of disagreement as may be decided by the State Government) shall be made to the lessee/lessees by reason of the exercise of this liberty.

The lessee/lessees shall not appoint / let any child labourers to work in the mines, failing which action will be initiated to cancell / determined the mining lease.

PART IV

LIBERTIES, POWERS AND PRIVILEGES RESERVED TO THE STATE GOVERNMENT

1. To work other minerals.

Liberty and power for the State Government or any lessee/licencee or persons authorised by it in that behalf to enter into and upon the said lands and to search for, win, work, dig, get, raise, dress, process, convert and carry away any minerals other than the said minerals and any other substances, and for the above purposes to sink, drive, make, erect, construct, maintain and use such pits, shafts, machines, drifts, levels and other liner, waterways, airways, water courses, cisterns, reservoirs, engines, machinery, plant buildings, canals, tramways, railways and other work and conveniences as may be deemed necessary or convenient;

Provided that in the exercise of such liberty and power no substantial hindrance or interference shall be caused to with the liberties powers and privileges of the lessee/lessees under these presents and that the lessee/lessees shall be entitled to such fair compensation as may be mutually agreed upon or in the event of disagreement as may be decided by the State Government shall be made to the lessee/lessees for all loss or damage sustained by the lessee/lessees by reason or in consequences of the exercise of such liberty and power.

2. To make railways and roads.

Liberty and power to the State Government or any lessee or person authorised by it in that behalf to enter into and upon the said lands and to make upon over or through the same any railways, tramways or pipelines for any purpose other than those mentioned in part-II of these presents and to get from the said lands stones, gravel, earth and other

materials for making, maintaining and repairing such railways, tramways, and roads in connection with existing railways and roads and to use and repair at all times with or without horses, carts or other animals carriages, trucks, lines, locomotives, or other vehicles over or along such railways, tramways, roads, lines, and other ways for all purposes and as occasion may require PROVIDED ALWAYS that in the exercise of such liberty and power by such other lessee or person, no substantial hindrance or interference shall be caused to or with the liberties powers and privileges vesting, established under these presents and that fair compensation (as may be mutually agreed upon or in the event of disagreement as may be decided by the State Government) shall be made to the lessee/lessees for all loss or damage by substantial hindrance or interference shall be caused to or with the exercise by such lessee or person of such liberty and power.

PART V

RENTS AND ROYALTIES RESERVED BY THIS LEASE

1. To pay dead rent or royalty whichever is greater:

That lessee shall pay for every year except the first year of the lease dead rent as specified in clause 2 of the part. Provided that where the holder of such mining lease becomes liable under section 9 of the Act, to pay royalty for any mineral removed or consumed by him or by his agent, manager, employee, contractor sub-lessee from the leased area, he shall be liable to pay either such royalty or the dead rent in respect of the area whichever is higher.

2. Rate and mode of payment of dead rent:

Subject to the provision of Clause 1 of the Act, during the subsistence of the lease the lessee/lessees shall pay to the State Government annual dead rent for the lands demised and described in part-I of this Schedule, the rate for the time being specified in the third schedule to the Act in such manner, as may be, specified in this behalf by the State Government.

Sl. No.	Name of the Mineral	Dead rent fixed per hectare	Area of decimal lane	Dead rent payable	Total Payable	Dead rent in year
1.	LIMESTONE					
2.					per hectare	minimum
3.					per hectare	decimal
4.						
5.						

Here insert the manner in which and the time at which the dead rent, surface rent and water rate should be paid

3. Rate and mode of payment of royalty :

Subject to the provisions of Clause 1 of this part, the lessee/lessees shall during the subsistence of this lease pay to the State Government at such times and in such manner as

the State Government may prescribe royalty in respect of any mineral/minerals removed by him/them from the leased area at the rate for the time being specified in the Schedule to the Mines and Minerals (Regulation and Development) Act, 1957.

(3.A). The lessee/lessees shall not remove any ores of minerals from the lease area except under and in accordance with the conditions of a permit issued by the Director of Mines and Geology in Karnataka in payment by the lessee/lessees of the royalty due on the ores or minerals.

4. Payment of surface rent and water rate :

The lessee/lessees shall pay rent and water rate the State Government in respect of all part of the surface of the said lands which shall from time to time be occupied or used by the lessee/lessees under the authority of these present at the rate of Rs. .2.....50..... respectively per annum per hectare of the area so occupied or used and so in proportion for any area less than a hectare during the period from the commencement of such occupation or use until the area shall cease to be so occupied or used and shall as far as possible restore the surface laid so used to its original condition. Surface rent and water rate shall be paid as herein before detailed in Clause (2). PROVIDED THAT no such rent/water rate shall be payable in respect of the occupation and use of the area comprised in any roads or ways to which the public have full right of access.

5. Local and other cesses and taxes as prevalent in .....Bellary..... District.

PART VI

PROVISIONS RELATING TO THE RENTS AND ROYALTIES

Rent and royalties to be free from deduction etc.,

1. The rent water rate and royalties mentioned in Part V of this Schedule shall be paid free from any deductions to the State Government at ....Bellary..... .....and in such manner as the State Government may prescribe PROVIDED ALWAYS and it is hereby agreed that Rs. ..... the balance standing to the credit of the lessee/lessees on account of the deposit made by him/them as a lessee/lessees over an area which included the said lands shall be retained and accepted by the State Government in satisfaction of the rents and royalties mentioned in Part V until they reach that amount.

2. Mode of computation of royalty.

For the purpose of computing the said royalties the lessee/lessees shall keep a correct account of the mineral/minerals produced and dispatched the account as well as the weight of the mineral/minerals in stock or in the process of export may be checked by any Officer authorized by the Central or a State Government.

Asst. General Manager (Mines & Quarries)
for RELIANCE AUTHORITY OF INDIA LTD.
VINAYAKNAGAR COLONY & STEEL PLANT
Bellary - 583104.

there specify the mode of arriving at sale price/process of pits mouth of mineral/minerals)

3. Consequence of action if rents and royalties are not paid in time.

Should any rent, royalty or other sums due to the State Government under the terms and conditions of these presents be not paid by the lessee/lessees within the prescribed time, the same may be recovered together with simple interest due thereon at the rate of twenty four percent per annum on a certificate of such officer as may be specified by the State Government by general or special order in the same manner as an arrear of land revenue.

PART VII

THE COVENANTS OF THE LESSEE/LESSEES

1. Lessees to pay rents, royalties, Taxes, etc.

The lessee/lessees shall pay the rents and royalties reserved by this lease at such times and in the manner provided in PART V and VI of these presents and also pay and discharge all taxes, rates assessments and impositions whatsoever being in the nature of public demands which shall from time to time be charged, assessed or imposed by the authority of the Central and State Government upon or in respect of the premises and works of the lessee/lessees in common with other premises and works of alike nature except thereunto for land revenue.

2. To maintain and keep boundary marks in good order.

The lessee/lessees shall at his/their own expenses erect and at all times maintain and keep in repair boundary marks and pillars according to the demarcation to be shown in the plan annexed to this lease/licence. Such marks erect and pillars shall be sufficiently clear of the shrubs and other obstructions as to allow easy identifications.

3. To commence operations within a year and work in a workmanlike manner.

The lessee/licensee shall commence operation within a year from the date of execution of the lease and shall thereafter at all times during the continuance of this lease, search for, win, work and develop the said minerals without voluntary intermission in a skilful and workman like manner and prescribed under clause 12 hereinafter without doing or permitting to be done any unnecessary or avoidable damage to the surface of the said lands or the crops, buildings, structures, or other property for the purposes of this clause operation shall include the erection of machinery laying of a tramway or construction of a road in connection with the mine.

4. To indemnify Government against all claims.

The lessee/lessees shall make and pay such reasonable Satisfaction & compensation as may be assessed by lawful authority in accordance with the law in force on the subject

K. MANALINGAM
Asst. General Manager (Mines & Quarries)
for RELIANCE AUTHORITY OF INDIA LTD.
VINAYAKNAGAR COLONY & STEEL PLANT
Bellary - 583104.

...minerals)

...under the terms ... the prescribed ... at the rate ... ecified by the ... amount of ...

...lease at such ... also may ... the nature ... posed by the ... ies and works ... nature except ...

...maintain and ... shown in the ... ently clear of ...

...ance.

... the date of ... of this lease, ... mission as ... without doing ... to of the said ... of this clause, ... struction of ...

...compensation ... the subject ...

...ALINGAM ... Manager (Mines & RM) ... OF INDIA LTD. ... & STEEL PLANT ... - 577 301.

... damage, injury or disturbance which may be done by him/them or persons employed by him/them in exercising any of the powers granted by this lease and shall indemnify and keep indemnified the Central Government and the State Government against all claims which may be made by any person or persons in respect of any such damage, injury or disturbance and all costs and expenses in connection therewith.

4. To secure and keep in good condition pits, shafts etc.

The lessee/lessees shall during the subsistence of this lease well and sufficiently secure and keep open with timber or other durable means all pits shafts and that may be made or used on the said land, make and maintain sufficient fences to the satisfaction of the State Government round every such pit, shaft or working whether the same is abandoned or not and shall during the same period keep all working in the said lands, except such as may be abandoned inaccessible free from water and foul air as far as possible.

5. To strengthen and support the Mines to necessary extent.

The lessee/lessees shall strengthen and support to the satisfaction of the Railway administration concerned or the State Government, as the case may be, any part of the mine which in its opinion requires such strengthening or support for the safety of any railway, reservoirs, canal, road and any other public works or structures.

6. To allow inspection of working.

The lessee/lessees shall allow any officer author ised by the Central Government or the State Government in that behalf to enter upon the premises including any buildings, excavation or land comprised in the lease for the purpose of inspecting, examining, surveying prospecting and making plans there of sampling and collecting any data and the lessee/lessees shall with proper person employed by the lessee/ essees and acquainted with the mines and works effectually assist such officer, agents, servants and workmen in conducting every such inspection and shall afford them all facilities, information connected with the working of the mines which they may reasonably require and also shall and will conform to and observe all orders and regulations which the Central or State Governments as the result of such inspection of otherwise may from time to time deem fit to impose.

7. To report accidents.

The lessee/lessees shall without delay send to the Deputy Commissioner/Director of Mines and Geology a report of any accident causing death or serious bodily injury or serious injury to property or seriously affection or endangering life or property which may occur in the course of the operation under this lease.

8. To report discovery of other minerals.

The lessee/lessees shall report to the State Government, the discovery in the leased area of any mineral not specified in the lease within sixty days of such discovery, along with full particulars of the nature and position of such such find. If any mineral not

K. MALAIYAGAM
Asst. Chief. Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
BHADRAVATI - 577 301.

specified in the lease shall not without the consent of the Central Government dispose of such mineral or any such mineral included in the lease or a separate lease obtained therefore.

10. To keep records and account regarding production and employees etc.

The lessee/lessees shall at all times during the said term keep or cause to be kept at an office to be maintained upon or near the said lands correct and intelligible books of accounts which shall contain regular entries showing particulars of:

(1) Quantity and quality of the said mineral/ minerals received from the said lands;

(2) Quantity of the various qualities of the ores beneficiated or converted, (for example coal converted into coke)

(3) Quantities of the various qualities of the said mineral/minerals sold and exported separately.

(4) Quantities of the various qualities of the said mineral/minerals otherwise disposed of and the manner and purpose of such disposal.

(5) The prices and all other particulars of all sales of the said mineral/minerals.

(6) The number of persons employed in the mines or works or upon the said lands specifying nationality, qualifications and pay of the technical personnel.

(7) Such other facts, particulars and circumstances as the Central or the State Governments may from time to time required and shall also furnish free of charge to such officers and at such times as the Central and State Governments may appoint, true and correct abstracts of all or any such books of accounts and such information and returns to all or any of the matters aforesaid as the State Government may prescribed and shall at all reasonable times allow such officers as the Central Government of State Government shall in that behalf appoint, to enter into and have access to the said officers for the purposes of examining and inspecting the said books of accounts, plans and records and to make copies thereof and make extracts there from.

11. To maintain plans etc.

The lessee/lessees shall at all times during the said term maintain at the mine office correct, intelligible, up to-date complete plans sections of the mines in the said lands. They shall show all the operations workings, and all the trenches, pits and drillings made by the him/them in the course of operations carried on by him/them under the lease, faults and other disturbances encountered and geological data and all such plans and sections shall be amended an filled up by and from actual surveys to be made for that purposes at the end of

K. MALAIYAGAM
Asst. Chief. Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
BHADRAVATI - 577 301.

twelve months or any period specified from time to time and the lessee/lessees shall furnish free of charge to the Central and State Governments true and correct copies of such plans and section whenever required. Accurate records of all trenches, pits and buildings shall also

(a) The sub-soil and strata through which they pass

(b) Any minerals encountered

(c) Any other matter of interest and all data required by the Central or the State Government from time to time.

The lessee/lessees shall allow any officer of the Central or the State Governments authorised in this behalf by the Central Government to inspect the same at all reasonable times, further they shall also supply when asked for by the State Government/ the Coal Controller/ the Director/General Geological Survey of India/the Controller Indian Bureau of Mines, a composite plan of the area showing thickness dip, inclination, etc., of all the seams as also the quantity of reserves quality wise.

11A. The lessee shall pay a wage not less than the minimum wage prescribed by the Central or State Government from time to time

11B. The lessee shall comply with provisions of the Mines Act, 1952 and rules made there-under.)

11C. The lessee shall take measures for the protection of environment like planting of trees, reclamation of land, use of pollution control devices and such other measures as may be prescribed by the Central or state Government from time to time at his own expenses.

11D. The lessees shall pay compensation to the occupier of the land on the date and in the manner laid down in these rules.

11E. The lessee shall in the matter of employment give preference to the tribals and to the persons who become displaced because of the taking up of mining operations.

12. **Act 67 of 1957 :**

The lessee/lessees shall be bound by such rules may be issued from time to time by the Government of India under Section 18 of the Mines and Minerals (Regulations and Development) Act, 1957 (Act 67 of 1957) and shall not carry on mining or other operations under the said lease in any way other than as prescribed under these rules

K. P. SRINIVAS
Asst. General Manager (Mines & R&D)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301.

13. Provision relating to [illegible]

Unless special exemption is granted by the State Government the lessee/lessees shall provide and install at or near the pit head or each of the pit heads at which the said minerals shall be brought, a strong, properly constructed and efficient weighing machine and shall weigh or cause to be weighed thereon all the said minerals from time to time brought to surface and exported and converted and also the converted products shall at the close of each working day, the said weights ascertained by such means of the said minerals, ores products raised, sorted, exported and converted during the previous twenty-four hours to be entered in the aforesaid books of accounts. The lessee/lessees shall permit the State Government at all times during the said term to employ and persons or persons to be present at the weighing of the said minerals as aforesaid and to keep accounts thereof and to check the accounts kept by the lessee/lessees. The lessee/lessees shall give fifteen days previous notice in writing to the Director of Mines and Geology of every such measuring or weighing in order that he or some officer in his behalf may be present thereat.

14. **To allow test of weighing machine :**

The lessee/lessees shall allow any person or persons appointed in this behalf by the State Government at any time or times during the said term to examine and test every weighing machine to be provided and kept as afore-said and the weights used there with in order to ascertain whether the same respectively are correct and in good repair and order and upon any such examination or testing any such weighing machine of weights shall be found incorrect or out of repair or order the State Government may require that the same be adjusted, repaired and put in order by and at the expense of the lessee/lessees and if such requisition be not complied with within fourteen days after the same shall have been made, the State Government may cause such weighing machine or weights to be adjusted, repair and put in order and the expense of so doing shall be paid by the lessee/lessees to the State Government on demand and if upon any such examination or testing as aforesaid any error shall be discovered in any weighing machine or weights to the prejudice of the State Government such error shall be regarded as having existed for three calendar months previous to the discovery thereof or from the last occasion of so examining and testing the same weighing machine and weights in case such occasion shall be within such period of three months and the said rent and royalty shall be paid and accounted for accordingly.

15. **To pay compensation for injury to third parties :**

The lessee/ lessees shall make any pay reasonable satisfaction and compensation for all damage, injury or disturbance of person or property which may be done by or on these

K. P. SRINIVAS
Asst. General Manager (Mines & R&D)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301.

[illegal] [illegal] [illegal]

of the lessee/lessees in exercise of the [illegible] and power granted by [illegible] shall [illegible] have [illegible] and keep indemnified the State Government from and against all [illegible] claims and demands which may be brought made by any person in respect of [illegible] damage, injury or disturbance.

16. Not to obstruct working of other minerals.

The lessee/lessees will exercise the liberties and powers hereby granted in such a manner as to offer as unnecessary or unreasonable avoidable obstructions or interruption to the development and working within the said lands of any minerals not included in this lease and shall at all times afford to the Central and State Government and to the holders of prospecting licences, mining leases in respect of any such minerals or any such minerals within any land adjacent to the said lands as the case may be reasonable means of access and safe and convenient passage upon and across the said lands to such minerals for the purpose of getting working, developing and carrying away the same provided that the lessee/lessees shall receive reasonable compensation for any damage or injury which they may sustain by reason of in consequence of the use of such passage by such lessee/lessees or holders of prospecting licences.

17. Transfers of lease :

1. The lessee/lessees shall not, without the previous consent in writing of the State Government, which in the case of a mining lease in respect of any minerals specified in the First Schedule to the Act shall not be given except after previous approval of the Central Government

a) assign, subject, mortgage or in any other manner, transfer the mining lease or any right, title or interest therein or

b) enter into or make any arrangement, contract or understanding whereby the lessee/lessees will or may be directly or indirectly financed to a substantial extent by or under which the lessee's operations or undertakings will or may be substantially controlled by any person or body of persons other than the lessee/lessees.

Provided that the State Government shall not give its written consent unless:

a) the lessee has furnished an affidavit along with his application for transfer of the mining lease specifying therein the amount that he has already taken or proposes to take as consideration from the transferee.

b) the transfer of the mining lease is to be made to a person or body directly undertaking mining operations.

K.MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT
Bhadravati - 577301.

(2) Without prejudice to the above provisions, the lessee/lessees may subject to the provisions contained in the [illegible] Rules, transfer the lease or any right, title or interest therein, if a person who has filed an affidavit stating that he has filed a due income tax returns, paid the [illegible] assessed in time and paid the income tax on the basis of self assessment in pursuance of the Income tax Act 1961 (43 of 1961) on payment of five hundred rupees to the State Government.

Provided that the lessee/lessees shall make available to the transferee the original or certified copies of all plans of abandoned workings in the area and in a belt meters wide surrounding it.

Provide further that where the Mortgage is an institution or a Bank or a Corporation specified in Schedule V it shall not be necessary for any such institution Bank or Corporation to meet with the requirement relating income tax.

(3) The State Government may by order in writing, determine the lease at any time if the lessee/lessees has/have in the opinion of the State Government committed a breach of any of the above provisions or has/have transferred the lease or any right, title or interest therein otherwise than in accordance with a consent.

Provided that no such order shall be made without giving the lessee/lessees a reasonable opportunity stating his/their case.

18. Not to be financed or controlled by a Trust, Corporation Firm or person.

The lease shall not be controlled and the lessee/lessees shall not allow themselves to be controlled by any Trust, Syndicate, Corporation, Firm or person except with the written consent of the Central Government. The lessee/lessees shall not enter into or make any arrangement compact or understanding whereby the lessee/lessees will or may be directly or indirectly financed by or under which the lessee/lessees operations or undertakings will or may be carried on directly or indirectly by or for the benefit of or subject to the control of any Trust, Syndicate, Corporation, Firm or person unless with the written sanction given prior to such arrangement compact or understanding being entered into or made of the Central Government and any or every such arrangement compact or understanding as aforesaid entered into or made with such sanction as aforesaid, shall only be entered into or made and shall always be subject to an express condition binding upon the other party or parties thereto that on the occasion of state of emergency of which the President of India in his discretion shall be the sole judge it shall be terminable if so required in writing, by the State Government and shall in the event of any such requisition being made be forthwith thereafter determined by the lessee/lessees accordingly.

K.MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT
Bhadravati - 577301.

The lessee shall deposit any additional amount if necessary.

Whenever the security deposit of Rs 10,000/- or any part thereof or any further sum thereafter deposited with the State Government in replenishment thereof shall be utilised or appropriated by the Central or State Government pursuant to the power hereinafter declared in that behalf the lessee/lessees shall deposit with the State Government such further sum as may be sufficient with the unappropriated part thereof to bring the amount so deposited with the State Government up to the sum of Rs. 10,000/-.

20. Delivery of working in good order to State Government after determination of lease.

The lessee/lessees shall at the expiration or sooner determination of the said term or any renewal thereof deliver up to the State Government all mines, pits shafts, inclines drifts levels, water-ways, airways, and other works now existing or hereafter to be sunk or made in or under the said lands except such as have been abandoned with the sanction of the Government and in an orderly and fair course of working all engines machines plant, buildings, structures other works and conveniences which at the commencement of the said term were upon or under the said lands and all such machinery set up by the lessee/lessees below ground which cannot be removed without causing injury to the mines or works under the said lands (except such of the same as may with the sanction of the State Government have become distrussed) and all buildings and structures of bricks or stone erected by the lessee/lessees above ground level in good repair order and condition and fit and requisite for further working of the said mines and the said minerals.

21. Right of pre-emption

a) The State Government shall from time to time and all times during the said term have the right (to be exercised by notice in writing to the lessee/lessees) of pre-emption of the said minerals (and all products thereof) lying in or upon the said lands hereby demised or elsewhere under the control of the lessee/lessees and the lessee/lessees shall with all possible expedition deliver all mineral or products or minerals purchased by the State Government under the power conferred by this provision in the quantities at the times in the manner and at the place specified in the notice exercising the said right

b) Should the right of pre-emption conferred by this present provision be exercised and a vessel chartered to carry the minerals or products thereof procured on behalf of the State Government or the Central Government be detained on demurrage at the port of loading the lessee/lessees shall pay the amount due to causes beyond the control of the lessee/lessees.

17

R MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301.

c) The price to be paid for all minerals or products of minerals taken by or on behalf of the State Government in exercise of the rights hereby conferred shall be the fair market price prevailing at the time of pre-emption PROVIDED THAT in order to assist in arriving at the said fair market price the lessee/lessees shall be required furnish to the State Government from time to time confidential information of the Government particulars of the quantities descriptions and prices of the said minerals of products thereof sold to purchasers and of charges entered into for freight carriage of the same and shall produce to such officer or officers as may be directed by the State Government original or authenticated copies of contracts and charter parties entered into for the sale or freighting of such minerals or products.

d) In the event of the existence of a state or war or emergency (of which existence of President of India shall be the sole judge and a notification to this effect in the Gazette of India shall be conclusive proof) the State Government with the consent of the Central Government shall from time to time and all times during the said term have the right (to be exercised by notice in writing to the lessee/lessees) forthwith take possession and control of the works, plant, machinery and premises of the lessee/lessees on or in connection with the said lands or operations under this lease and during such possession or control the lessee/lessees shall conform to and obey all direction given by or on behalf of the Central Government or State Government regarding the use of employment of such works, plant, premises and minerals. PROVIDED THAT fair compensation which shall be determined in default of agreement by the State Government shall be paid to the lessee/lessees for all loss or damage sustained by him/them by reason or in consequence of the exercise of the powers conferred by this clause and PROVIDED ALSO that the exercise of such powers shall not determine the said term hereby granted or effect the terms and provisions of these presents further that may be necessary to give effect to the provisions of this clause.

22. Employment of Foreign National

The lessee/lessees shall not employ in connection with the mining operations any person who is not an Indian national except with the previous approval of Central Government.

18

R MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301.

... of expenses incurred by the State Government.

... of the works or matters which in accordance with the covenants in that behalf ... contained are to be carried or performed by the lessee/lessees be not so carried ... performed within the time specified ... in that behalf, the State Government, may cause ... to be carried out or performed and the lessee/lessees shall pay the State ... on demand all expenses which shall be incurred in such carrying out or ... of the same and the decision of the State Government as to such expenses ... final.

... of Geophysical data

The lessee/lessees shall furnish-(a) all geophysical data relating to mining fields or ... and ground water surveys, such as anomaly maps, sections, plans structures, ... maps, logging, collected by him/ them during the course of mining operations to ... General, Geological Survey of India, Calcutta.

... information pertaining to investigations of radio active minerals collected by ... during the course of mining operations to the Secretary, Department of Atomic ... New Delhi.

Data or information referred to above shall be furnished every year reckoned from ... of commencement of the period of the mining lease.

PART VIII

The Covenants of the State Government

1. Lessee/Lessees may hold and enjoy rights quietly

The lessee/lessees paying the rents, water rets and royalties here by reserve and observing and performing all the covenants and agreements herein contained and on the ... of the lessee/lessees to be observed and performed shall and may quietly hold and ... the rights and premises hereby demised for and during the term hereby granted ... any unlawful interruption from the State Government or any person rightfully ... under it.

2. Acquisition of lands of third parties and compensation thereof

If in accordance with the provision of Clause 4 of Part VI of this Schedule, the ... shall offer to pay to an occupier of the surface of any part of the said lands ... for and damage or injury which may arise from the proposed operations of ... and the said occupier shall refuse his consent to be exercise of the right ... reserved to the State Government and demised to the lessee/lessees by these ... and the lessee/lessees shall report the matter to the State Government and shall

K. MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
Bhadravati - 577301.

... deposit with ... such amount ... compensating him if the Central/State Government ... are not satisfied ... the amount ... consideration offered to him and reasonable or if he is not ... satisfied and ... lessee/lessees shall have deposited with it such further amount as the State ... and Central Government deem ... consider fair and reasonable, the State Government may ... order the ... to ... the lessees to enter the land and to carry out ... operations as may be necessary for the purpose of this lease. In assessing the amount of ... compensation ... State Government shall be guided by the principles of the ... Acquisition Act ...

3. Terminate

The mining lease is renewable in terms of the Provisions of the Act and the ... made there under.

Provided that the State Government may for reasons to be recorded in ... reduce the area applied for.

If the lease is in respect of minerals specified in the First Schedule to the Act ... renewal will be subject to the prior approval of the Central Government.

If the lessee/lessees be desirous of taking a renewal lease of the premises ... demised or of any part or parts of them for a further term from the expiration of the ... hereby granted and is otherwise eligible, he/ they shall prior to the expiration of the ... mentioned term give to the State Government 12 calendar months previous notice in ... writing and shall pay the rents, rates and royalties hereby reserved and shall observe and perform the several covenants and agreements herein contained and on the part of the ... lessee/lessees to be observed and performed up to the expiration of the term hereby ... granted. The State Government on receipt of application for renewal, shall consider it in accordance with the provisions of the Act and the rules made thereunder and shall pass ... orders as it deems fit. If renewal is granted the State Government will at the expense of the ... lessee/lessees and upon his executing and delivering to the State Government if required ... counter part thereof execute and deliver to the lessee/lessees a renewed lease of the said ... premises or part thereof for the further term of ...30... thirty ... years at such rents, ... and royalties and on such terms and subject to such rents, rates and royalties and on ... terms and subject to such covenants and agreements, including this present covenant for ... renewal as shall be accordance with the Mineral Concession Rules, 1960, applicable ... to ...LIMESTONE... (Name of Mineral) on the day next following the ... expiration of the terms hereby granted).

4. Liberty to determine the lessee

The lessee/lessees may at any time determine this lease by giving not ... less than ... calendar months notice in writing to the State Government or to such officer or authority ... as the State Government may specify in this behalf and upon the expiration of such notice ... provided that the lessee/lessees shall upon such expiration render and pay all rents, ... rates, royalties, compensation for damages and other moneys which may then be due ...

... General Manager
STEEL AUTHORITY OF INDIA LTD.

[illegible] under these presents to the lessee or any other person or persons on all deeds or these presents to the State Government the lease and the said [illegible] powers and privileges hereby granted shall absolutely cease and determine, but without prejudice to any right or remedy of the lessor in respect of any breach of any of the covenants or agreements contained in these presents.

a. The State Government may on an application made by the lessee permit him to surrender one or more minerals from his lease which is for a group of minerals on the ground that deposits of that mineral have since exhausted or depleted to such an extent that it is no longer possible to work the mineral economically subject to the condition that the lessee-

b. Makes an application for such surrender of mineral at least six months before the intended date of surrender and

c. Gives an undertaking that he will not cause any hindrance in the working of the mineral so surrendered by any other person who is subsequently granted a mining lease for that mineral.

5. Refund of security deposit

On such date as the State Government may elect within twelve calendar months after the determination of this lease or of any renewal thereof, the amount of the security deposit paid in respect of this lease and then remaining in deposit with the State Government and not required to be applied to any of the purposes mentioned in this lease shall be refunded to the lessee/lessees. No interest shall run on the security deposit.

PART IX

General Provisions

1. Obstructions to Inspection

In case the lessee/lessees or his/their transferee/assignee does/do not allow entry or inspection by the Officers authorised by the Central or State Government under clauses (c), (i) or (j) of sub-rule (1) of rule 27 of said Rules, the State Government shall give notice in writing to the lessee/lessees requiring him/them to show cause within such time as may be specified in the notice why the lease should not be determined and his/their security deposit forfeited; and if the lessee/lessees fails/fail to show cause within the aforesaid time to the satisfaction of the State Government, the State Government may determine the lease and forfeit the whole or part of the security deposit.

2. Penalty in case of default in payment of royalty and breach covenants:

If the lessee/lessees or his/their transferee or assignee makes/make any default in payment of rent or water rate or royalty as required by Section 9 of the Act or rent or

K MARIALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301

[illegible] conditions and covenants other than those refer[illegible] covenant [illegible] Government shall give notice to the lessee/lessees [illegible] him/them to pay the said water rate, royalty or remedy the breach, as the case [illegible] within a reasonable time from the date of receipt of the notice and if the rent, water and [illegible] not paid or the breach is not remedied within such period, the State Government [illegible] without [illegible] that may be taken against him/them, determine the lease and forfeit the whole or part of the security deposit.

3. Penalty for repeated breaches of covenants

In cases of repeated breaches of covenants and agreements by the lessee/lessees [illegible] which notice has been given by the State Government in accordance with clause [illegible] (2) aforementioned on earlier occasion, the State Government without giving any [illegible] notice may impose such penalty not exceeding twice the amount of annual dead [illegible] specified in Clause 2, Part V.

4. Failure to fulfill the terms of leases due to "Force Majeure"

Failure on the part of the lessee/lessees to fulfil any of the terms and conditions [illegible] this lease shall not give the Central or State Government any claim against the lessee/lessees or be deemed a breach of this lease. If he/she/it as such failure is caused to the said Government to arise from force majeure, and if the [illegible] force majeure fulfillment by the lessee/lessees of any of the terms and conditions of this lease be delayed the period and such delay shall be added to the period fixed by this lease. In this clause the expression "Force Majeure" means Act of God, war, insurrection, riot, civil commotion, strike, tide, storm, tidal wave, flood, lightning, explosion, fire, earthquake and any other happening which the lessee/lessees could not reasonably prevent or control.

5. Lessee/Lessees to remove his/their properties on the expiry of lease:

The lessee/lessees having first paid and discharged rents, rates and royalties payable by virtue of these Presents may at the expiration or sooner determination of the said term within six calendar months thereafter (Unless the lease shall be determined under clause [illegible] and 8 of this Part and in this case at any time not less than three calendar months nor more than six calendar months after such determination) take down and remove for his/their own benefit all engines, machinery plant, buildings, structures, tramways, railway and other works, erections and conveniences which may have been erected/set up or placed by the lessee/lessees in or upon the said lands and which he lessee/lessees were not bound to deliver to the State Government under clause 20 of Part VII of this Schedule and which the State Government shall not desire to purchase.

6. Forfeiture of property left more than six months after determination of lease

If at the end of six calendar months after the expiration or sooner determination of the said term under the provision contained in clause 4 of Part VIII of this Schedule become effective there shall remain in or upon the said land any engines machinery plant

K MARIALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301

...structure thereon, railway and other work erection or construction or other property which are not required by the lessee/lessees in connection with ... the lands held by him/them under prospecting license or mining lease the same shall if so required by the lessee/lessees within one calendar month after the time in which ... shall have been given to the lessee/lessees by the State Government be deemed to become the property of the State Government and may be taken possession of in such manner as the State Government shall direct. A within 6 (six) months compensation or to account to the lessee/lessees therefor thereof.

7. Notices

Every notice by these presents required to be given to the lessee/lessees shall be given in writing to such person resident on the said lands as the lessee/lessees may appoint for the purpose of receiving such notice and if there shall have been no such appointment then every such notice shall be sent to be lessee/lessees by registered post addressed to the lessee/lessees at the address recorded in the lease or at such other address in India at the lessee/lessees may from time to time in writing to the State Government designate for the receipt of notice and every such service shall be deemed to the proper and valid service upon the lessee/lessees and shall not questioned or challenged by him.

8. Immunity of State Government from liability to pay compensation

If in any event of the orders of the State Government are revised, reviewed or cancelled by the Central Government in pursuance of proceedings under Chapter VII of Mineral Concession Rules, 1960, the lessee/lessees shall not be entitled to compensation for any loss sustained by the lessee/lessees In exercise of the powers and privileges conferred upon him/them by these presents.

9(A) The lease is executed at Bangalore ..... the Capital town of the state of Karnataka ..... (Name of the State) and subject to the provision of Article 226 of the Constitution of India it is hereby agreed upon by the lessee and the lessor that in the event of any dispute in relation to the area under lease, condition of lease, the dues realisable under the lease and in relation of all matters touching the relationship of the lessee and the lessor, the suits (or appeals) shall be filed in the Civil Courts at Shimoga ..... (Name of the city) and it is hereby expressly agreed that neither party shall be competent to file and institute at any place other than the courts named above."

9. For the purpose of stamp duty the anticipated royalty from the demised land is Rs. 82,63,000/- per year.

23

E. MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301.

भारत सरकार
Govt. of India

In the presence of

Signed by

K MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301.

Signed by

DIRECTOR
DEPT. OF MINES & GEOLOGY

For and on behalf of the Governor of Karnataka

At and on behalf of

Assistant Director (Mineral)
Dept. of Mines and Geology
Bangalore.

In the presence of

K. MAHALINGAM
Asst. General Manager (Mines & RM)
STEEL AUTHORITY OF INDIA LTD.
VISVESVARAYA IRON & STEEL PLANT
Bhadravathi - 577301.

Witness:

1) C. RAVI KUMAR REDDY S/O C. SOMALINGA REDDY
VISL IS DIV. Bhadravathi

2) [signature] ***
Venkatappa S/O Timmappa
VISL CSM Bhadravathi

24

Concorde Carbon Paper, Bangalore - 560 002

भारत सरकार/GOVERNMENT OF INDIA

ANNEXURE NO.

खान मंत्रालय/ MINISTRY OF MINES

भारतीय खान ब्यूरो/ INDIAN BUREAU OF MINES

खान नियंत्रक (दक्षिण क्षेत्र) का कार्यालय

OFFICE OF THE CONTROLLER OF MINES (SOUTH ZONE)

23373287

23373287/ 23375366 /67

29, Industrial Suburb, II Stage,
Tumkur Road, Yeshwanthpur,
Bangalore- 560 022.
Date: 24.06.2008

SZ/SMG/Lst-112-SZ

Shahgarh limestone mine,
Mineserve(s) Iron & Steel plant,
Steel Authority of India Ltd.,
Bhadravathi-577 301, Shimoga District, Karnataka.

Approval of Scheme of Mining (including Progressive Mine Closure Plan) in respect of Shahgarh Limestone mine mine over an area 47.12 ha in Shimoga District, Karnataka of M/s Steel Authority of India Ltd. submitted under Rule 12 of MCDR, 1988.

Your letter No. Nil dated 21.06.2008 submitting five bound copies of Scheme of Mining

In exercise of the power conferred by sub rule (4) of Rule 12 of Mineral Conservation and Development Rules, 1988, I hereby approve the aforesaid Scheme of Mining (including Progressive Mine Closure Plan). This approval is subject to the following conditions:

(1) Scheme of Mining (including Progressive Mine Closure Plan) is approved without prejudice to any other law applicable to the area from time to time whether made by the Central Government, State Government or any other authority.

(2) Scheme of Mining (including Progressive Mine Closure Plan) is approved without prejudice to any order/direction from any court of competent jurisdiction.

(3) It is also clarified that the approval of your aforesaid Scheme of Mining (including Progressive Mine Closure Plan) does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Development & Regulation) Act, 1957, or the rules framed thereunder and any other law.

(4) It is further clarified that the approval of the Scheme of Mining (including Progressive Mine Closure Plan) is subject to the provision of Forest (Conservation) Act, 1980, Forest Conservation Rules, 2003 and other relevant statutes, orders and guidelines as may be applicable to the lease area from time to time.

(5) Attention is invited to the Hon'ble Supreme Court's Interim Order on WP(C) No.2025 dated 12.12.1996 for compliance. The approval of this Scheme of Mining is, therefore, issued without prejudice to and is subject to the said direction of the Hon'ble Supreme Court as applicable in your case.

(6) Copy of EIA/EMP report, approved by MOEF, New Delhi, should be submitted to this office as well as to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, within one month positively along with a copy of their approval letter.

Yours faithfully,

KANTHARAJ K.
RQP/BGA/138/2000/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

No. MS/SMG/Lst-112-SZ

(7) The Company shall establish environmental monitoring cell. Environment monitoring C... Company shall continue monitoring ambient air quality, dust fall rate, water quality, soil ... analysis and noise level data in respect of various stations established for the purpose both ... core zone and buffer zone as per Department of Environment guidelines and keeping ... IBM's Circular No. 3/93, season wise every year or by engaging preferably the services ... Environmental laboratory by MOEF approved / CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer on demand.

(8) Provisions of the Mines Act, 1952 and Rule & Regulations made there under including ... of notice of opening, appointment of manager and other statutory officials as required by the Mines Act, 1952 shall be complied with.

(9) The execution of mining plan/ scheme of mining shall be subjected to variation of provisions/ orders/ notices, if any.

(10) If anything is found to be concealed as required by the Mines Act in the contents of Scheme of Mining and the proposal for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

(11) The validity period of the financial assurance should be renewed before the expiry of the same ... shall be submitted to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore under intimation to this office.

(12) A yearly report shall be submitted to the Regl. Controller of Mines, Indian Bureau of Mines, Bangalore before 1st July of every year setting forth the extent of protective and rehabilitation work carried out as envisaged in the approved mine closure plan.

Yours faithfully,

Strike: One copy of the approved Scheme of Mining (including Progressive Mine Closure Plan).

(Dr. B.P.SINGH)
खान नियंत्रक (द.क्षे.)
Controller of Mines (SZ)

Copy for kind information to:-

a) GLOBAL Environment & Mining Services, Devanandini, Opp. PLD Bank, Venkateshwara Talkies Road, Post Magal, Hospet-583 201 Bellary District, Karnataka.
b) Chief Controller of Mines, Indian Bureau of Mines, Nagpur.
c) Dy. Director of Mines Safety, Bellary sub-Region-II, Infantry Road, Cantonment, Bellary-583 ... Karnataka State along with a copy of the approved Scheme of Mining (including Progressive Mine Closure Plan).
d) Regional Controller of Mines, Indian Bureau of Mines, Bangalore, alongwith a copy of the approved Scheme of Mining (including Progressive Mine Closure Plan) for further follow up.
e) Director of Mines & Geology, Govt. of Karnataka, Khanij Bhavan, Race Course Road, Bangalore-560 001 along with a copy of the approved Scheme of Mining (including Progressive Mine Closure Plan).

Encl: As above

(Dr. B.P.SINGH)
खान नियंत्रक (द.क्षे.)
Controller of Mines (SZ)

ANNEXURE NO. 3

No. SEIAA 13 : MIN : 2010
STATE LEVEL ENVIRONMENT IMPACT ASSESSMENT AUTHORITY, KARNATAKA
(Constituted by Ministry of Environment and Forests, Government of India)
Department of Ecology and Environment
Room No. 710, 7th Floor, IVth Gate
M.S. Building, Bangalore - 560 001.

Date: 13th April 2011.

To,

M/s. Steel Authority of India Ltd.,
Visvesvaraya Iron & Steel Plant,
PB No. 105, Bhadravathi-577301,
Shimoga District.

Sir,

Sub: Expansion of Bhadigund Limestone mine from 0.6 LTPA to 1.0 LTPA in an area of 40.12 hectares (M. L. No. 1966) at Sy. No. 1/P of Kukavadi Uorani state Forest, Bhadigund Village, Bhadravathi Taluk, Shimoga District of M/s. Steel Authority of India Ltd.,- Issue of Environment Clearance reg.

* * * *

This has reference to your application No. Mines/HQ/389 dated 22.02.2010 addressed to SEIAA, Karnataka on the subject mentioned above. It has been noted that the proposal is for grant of environmental clearance under the provisions of EIA Notification, 2006, for expansion of Bhadigund Limestone mine from 0.6 LTPA to 1.0 LTPA. The total mine lease area of the project is 40.12 ha, which is a State Forest land. Out of 40.12 ha of ML area, 23.0 ha area is for mining, 7.20 ha area is for storage of OB, 4.53 ha area is for infrastructure & township, 2.62 ha area is for roads, 3.00 ha area is for green belt, 2.50 ha area is for other purpose. The Government of Karnataka in C & I Department has accorded sanction for Second renewal of Mining Lease No. 1966 for a period of 20 years with effect from 01.04.2003. Working will be opencast by mechanized method. The water requirement for the project is 20 KLD. During the life of mine about 15,000 tones of OB will be handled. The Ministry of Environment and Forests, Government of India has accorded in principle approval under Forest (Conservation) Act 1980 for diversion of 40.12 ha of forestland for mining in favor of M/s. Steel Authority of India Ltd. vide letter dated: 12.06.1998. On fulfillment of the conditions of the said in principle approval Govt. of India have conveyed its final approval vide letter dated 05.05.2000 under section 2 of the Forest (Conservation) Act 1980 for diversion of 40.12 ha of forestland in Kukavadi Uborani State Forest, Bhadigund Village, Bhadravathi Taluk, Shimoga District. The State Government accordingly vide Government Order No. FEE 28 ITM 97 dated: 29.08.2000 has sanctioned diversion of the said land for mining of limestone ore for a period of 20 years with effect from 01.05.1997. The Indian Bureau of

K.T.RAMACHANDRA
IAS/KNC/040/85/A

SEIAA 3 MIN 2010 Expansion of Bhadigund Limestone mine from 0.6 LTPA to 1.0 LTPA of M/s. Steel Authority of India Ltd.

Mines has approved mining plan on 27.06.2008 for lease area of 40.12 ha. Capital cost of the project is about ₹ 3.00 lakhs.

The SEAC has appraised the project in its meeting held on 24.04.2010 & 28/29.01.2011 and has recommended for issue of Environmental Clearance. The State Environment Impact Assessment Authority, Karnataka has examined the application in its meeting held on 05.03.2011 & 31.03.2011 in accordance with the EIA Notification 2006 and hereby accords environmental clearance under the provisions thereof to the above mentioned M/s. Steel Authority of India Ltd. for expansion of Bhadigund Limestone mine from 0.6 LTPA to 1.0 LTPA by opencast mechanized method involving mining lease area of 40.12 ha. Subject to implementation of the following conditions and environmental safeguards.

A. SPECIFIC CONDITIONS:

1. IBM approved mining plan shall be strictly implemented and shall not be operated beyond the validity period of the approved mining plan.
2. PAs should get the health checkup done for the mines workers and the nearby villagers once in six months and submit report periodically.
3. Afforestation be taken up in consultation with Forest Department.
4. Management Plan for the Core Zone for the entire lease period, for planning and soil and moisture conservation measures should be strictly implemented and periodical progress report submitted to the Authority/ Ecology and Environment Department, GOK.
5. The Management plan proposed for the surrounding/near by Forestland for wild life management and soil and moisture conservation works including closing the land by fencing, for protection, engagement of watch and ward etc to an extent of 5 times the mine area and periodical report submitted to the Authority/ Ecology and Environment Department, GOK.
6. The project proponent shall obtain necessary orders from the Forest Department before starting mining operation in that area.
7. The environmental clearance is subject to any policy change by the State Government as may be applicable to this project.
8. This Environmental Clearance is co-terminus with the lease granted under F(C) Act 1980 or mining lease under MM (D & R) Act 1957 which ever is earlier.
9. Environmental clearance is subject to final order of the Hon'ble Supreme Court of India in the matter of Goa Foundation Vs. Union of India in Writ Petition (Civil) No. 460 of 2004 as may be applicable to this project.
10. All the conditions stipulated in the Consent for establishment issued by Karnataka State Pollution Control Board should be effectively implemented.
11. The mining operations shall not intersect ground water table. Prior approval of the SEIAA / Ministry of Environment & Forests and

Central Ground water Authority shall be obtained for mining below water table.

12. The topsoil should be stacked at earmarked site only and should not be kept unutilized for a period more than 3 years. The topsoil should be used for reclamation and plantation.
13. Over burden shall be stacked at earmarked site (s) only and should not be kept active for long period. The maximum height of the dumps should not exceed 30m having 3 terraces of 10m each. The overall slope of the dump shall not exceed 27°. The OB dumps should be scientifically vegetated with suitable native species to prevent erosion and surface run off. In critical areas use of geo textiles shall be undertaken for stabilization of the dump. Monitoring and management of rehabilitated areas should continue until the vegetation becomes self-sustaining. Compliance status should be submitted to the SEIAA Karnataka, Department of Environment and Ecology, Govt. of Karnataka, Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi and the Regional Office MoEF, Bangalore on six monthly basis.
14. Catch drains and siltation ponds of appropriate size should be constructed to arrest silt and sediment flows from mine working, soil, OB and mineral dumps. The water so collected should be utilized for watering the mine area, roads, green belt development etc. The drains should be regularly de-silted particularly after monsoon and maintained properly. Check dams and water harvesting structures be undertaken to completely harvest the rain water.
15. Garland drain (size, gradient and length) shall be constructed for mine pit, soil, OB and mineral dumps and sump capacity should be designed keeping 50% safety margin over and above peak sudden rainfall (based on 50 years data) and maximum discharge in the area adjoining the mine site. Sump capacity should also provide adequate retention period to allow proper settling of silt material. Sedimentation pits should be constructed at the corners of the garland drains and de-silted at regular intervals.
16. Dimension of the retaining wall at the toe of dumps and OB benches within the mine to check run-off and siltation should be based on the rainfall data.
17. The project authority should implement suitable conservation measures to augment ground water resources in the area in consultation with the Regional Director, Central Ground Water Board.
18. Regular monitoring of ground water level and quality should be carried out by establishing a network of existing wells and constructing new peizometers during the mining operation. The monitoring should be carried out four times in a year Pre-monsoon (April – May), monsoon (August), post-monsoon (November) and winter (January) and the data thus collected may be sent regularly to Department of Environment and Ecology, Govt. of Karnataka, Regional Director (Environment), Department of Environment and

Ecology, Government of Karnataka, Udupi and the Regional office MoEF, Bangalore, Central Ground Water Authority and Regional Director, Central Ground Water Board.

19. Appropriate mitigation measures should be taken to prevent pollution of nearby water bodies in consultation with the State Pollution Control Board.
20. The project proponent shall submit clearance from the competent authority for drawl of requisite quantity of water for the project before starting work on the project.
21. Suitable rainwater harvesting measures on long-term shall be planned and implemented in consultation with Regional Director, Central Ground Water Board.
22. Vehicular emissions should be kept under control and regularly monitored. Measures shall be taken for maintenance of vehicles used in mining operations and in transportation of mineral. The vehicles should be covered with a tarpaulin and shall not be overloaded.
23. Blasting operation should be carried out only during the daytime. Controlled blasting should be practiced. The mitigative measures for control of ground vibrations and to arrest fly rocks and boulders should be implemented.
24. Drills shall either be operated with dust extractors or equipped with water injection system.
25. Digital processing of the entire lease area using remote sensing technique should be done regularly once in three years for monitoring land use pattern and report submitted to SEIAA Karnataka, Department of Environment and Ecology, Govt. of Karnataka and the Regional Office, MoEF, Bangalore.
26. The project authorities should undertake sample survey to generate data on pre project community health status within a radius of 1 km from proposed mine.
27. Consent to operate should be obtained from State Pollution Control Board prior to start of production from the mine.
28. Proper sanitary facilities should be installed for the colony. Domestic waste generated should be disposed in a scientific manner. Proper first aid facilities and health care facilities should be provided for the labourers.
29. The project proponent shall take all precautionary measures during mining operation for conservation and protection of endangered fauna spotted in the study area. Action plan for conservation of flora and fauna shall be prepared and implemented in consultation with the State Forest and Wildlife Department. The proponent shall contribute towards the cost of implementation of the plan and / or Regional Wildlife Management Plan for conservation of wild life. The amount so contributed shall be included in the project cost. A copy of the action plan may be submitted to the SEIAA, Department of Environment and Ecology, Govt. of Karnataka, the Regional Office, MoEF, Bangalore and the Regional Director (ENV), Department of

Ecology and Environment, Government of Karnataka, Udupi within 3 months.

30. The project proponent shall delineate Mining Closure Plan/ Mine's protocol to rehabilitate the mined out land to match its surrounding land use including removal, storage and reuse of top soil from mining area to cover reclaimed area. Post Mining Land Use Plan with rehabilitation of mined out area (with Plan and Section) provided in Flora Fauna Conservation Plan and submit to SEIAA.
31. A master plan indicating clearly the details of social development proposed by the PAs with year wise investment and details of proposed works to be taken up for the entire lease period for the local villages shall be submitted immediately to the SEIAA.
32. Plantation monitoring programme during post project period for ensuring survival and growth rate of plantation in reclaimed area.
33. A Final Mine Closure Plan along with details of Corpus Fund should be submitted to the SEIAA Karnataka, Department of Environment and Ecology, Govt. of Karnataka, Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi and the Regional Office, MoEF, Bangalore 5 years in advance of final mine closure for approval.
34. Check dams and gully plugs along the smaller streamlets in the area, should be constructed to arrest the loose soil flow from the mine area.
35. Ground water augmenting measures should be undertaken immediately and detailed report submitted within 3 months time.
36. The provisions of FC Act 1980-para 2 need to be followed. A location map of the mine on a 1:50,000 scale Sy. of India Topo-sheet should be provided. This map should depict the location of other mines (existing and proposed) in the buffer zone area. The targeted production levels of the existing and proposed mines in the buffer zone need to be provided. The land use pattern of the buffer zone also needs to be provided. This information should be submitted to the Authority immediately.
37. Particulars of ore production and dispatch till date should be provided by the mine owner and yearly report in future.
38. The infrastructure of transport roads should be improved collectively by the mine owners of the area.
39. Link road from mining site to main road shall be maintained and black topped by the project proponent.
40. Effective safeguard measures such as regular water sprinkling shall be carried out in critical areas prone to air pollution and having high levels of particulate matter such as haul road, loading and unloading point and all transfer points.
41. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the MoEF, Govt. of India, New Delhi.
42. Mineral handling area shall be provided with adequate number of high efficiency dust extraction system. Loading and unloading areas

and dump all the dust prone points should also have efficient dust control arrangements. These should be properly maintained and operated.

43. Pre-placement medical examination and periodical medical examination of the workers engaged in the project shall be carried out and records maintained. For the purpose, schedule of health examination of the workers should be drawn and followed accordingly.
44. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.
45. Conservation measures for protection of flora and fauna in the core & buffer zone should be drawn up in consultation with the local forest and wildlife department.
46. The project proponent shall establish electronic weighing bridge at the mine head, so as to keep the correct weight of the minerals removed.
47. The Authority noted that the proponent have already spent ₹ 20 Lakhs towards community development activities. Further, the proponent shall spend ₹ 2 Lakhs per annum for education, sanitation, water supply, free medical check up camps and community activities in the neighbouring villages towards corporate social commitment made in the presentation and report be submitted to the Authority.

B. GENERAL CONDITIONS:

1. No change in mining technology and scope of working should be made without prior approval of the SEIAA Karnataka.
2. No change in the calendar plan including excavation, quantum of mineral and waste should be made.
3. Air quality monitoring stations shall be established in the core zone as well as in the buffer zone for RPM, SPM, SO2, NOX monitoring as per the norms. Location of the stations should be decided based on the meteorological data, topographical features and environmentally and ecologically sensitive targets and frequency of monitoring should be undertaken in consultation with the State Pollution Control Board.
4. It shall be ensured that the Ambient Air Quality parameters conform to the norms prescribed by the MoEF, Govt. of India, New Delhi.
5. Data on ambient air quality (RPM, SPM, SO2, NOX) should be regularly submitted to the SEIAA Karnataka, Department of Environment and Ecology, Govt. of Karnataka, Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi and the Regional Office, MoEF, Bangalore and the State Pollution Control Board / Central Pollution Control Board once in six months.
6. Fugitive dust emission from all the sources should be controlled regularly. Water spray arrangement on haul roads, loading and

un-loading and at transfer points should be provided and properly maintained.

7. Measures should be taken for control of noise levels below 90 dB(A) in the work environment. Workers engaged in operations of HEMM etc., should be provided with earplugs / muffs.
8. Waste water from the mine should be properly collected, treated so as to conform to the standards prescribed under GSR 422 (E) dated 19th may 1993 and 31st December, 1993 or as amended from time to time. Oil and grease trap shall be installed before discharge of effluents.
9. Personnel working in dusty areas should wear prospective respiratory devices and they should also be provided with adequate training and information on safety and health aspects.

   Occupational health surveillance program of the workers should be undertaken periodically i.e. once in 3 months to observe any contractions due to exposure to dust and take corrective measures, if needed. Quarterly report in this regard should be submitted to the Department of Environment and Ecology, Govt. of Karnataka, Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi, the Karnataka State Pollution Control Board and the Regional Office, MoEF, Bangalore.
10. A separate environmental management cell with suitable qualified personnel shall be set up under the control of a Senior Executive, who will report directly to the Head of the organization. The Environment management committee should be constituted with one of the member representing nearby village.
11. The funds earmarked for environmental protection measures should be kept in separate account and should not be diverted for other purpose. Year wise expenditure should be reported to the SEIAA Karnataka, the Department of Environment and Ecology, Govt. of Karnataka, Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi and the Regional Office, MoEF, Bangalore.
12. The project authorities should inform the SEIAA Karnataka, Department of Environment and Ecology, Govt. of Karnataka, Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi and the Regional Office, MoEF, Bangalore regarding date of financial closures and final approval of the project by the concerned authorities and the date of start of land development work.
13. The Regional Office of MoEF, Bangalore; the Department of Environment and Ecology, Govt. of Karnataka; the Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi and the Karnataka State Pollution Control Board shall monitor compliance of the stipulated conditions. The project authorities should extend full co-operation to the Officer (S) of these

offices by furnishing the requisite data / information / monitoring reports.
14. The project proponent shall submit half yearly report on the status of the implementation of the stipulated environmental safeguards to the SEIAA, Karnataka, Department of Environment and Ecology, Government of Karnataka, Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi, the Regional Office, MoEF, Bangalore, the Central Pollution Control Board and the Karnataka State Pollution Control Board.
15. As agreed the proponents should implement the proposed socio commitment plan. They should submit a detailed year wise programme for the entire lease period to the SEIAA, Karnataka, the Department of Environment and Ecology, Government of Karnataka within 3 months and strictly implement as per the plan. Six monthly progress report should be submitted in this regard.
16. A copy of the clearance letter will be marked to the concerned Panchayat, Local NGO, if any, from whom suggestions / representation has been received while processing the proposal.
17. The project proponent should display the conditions prominently at the entrance of the project on a big panel board for the information of the public.
18. The Karnataka State Pollution Control Board should display a copy of the clearance letter at the Regional office, District Industry Centre and Collector's office/ Tehsildar's office for 30 days.
19. The project authorities should advertise at least in two local newspapers widely circulated, one of which shall be in the vernacular language of the locality concerned, within 7 days of the issue of the clearance letter informing that the project has been accorded environmental clearance and a copy of the clearance letter is available with the State Pollution Control Board and also at website of the SEIAA, Karnataka at http://www.seiaa.kar.nic.in and a copy of the same should be forwarded to the Department of Environment and Ecology, Government of Karnataka; the Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, Udupi and the Regional Office, MoEF, Bangalore.
20. Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environmental (Protection) Act, 1986.
21. Any Appeal against this environmental clearance shall lie with the National Environment Appellate Authority, if preferred, within a period of 30 days as prescribed under Section 11 of the National Environment Appellate Authority Act, 1997.
22. The SEIAA or any other competent authority may alter / modify the above conditions or stipulate any further condition in the interest of environment protection.

SEIAA-3-V-IN-2710 Expansion of Bhadravati Ferrosilicon unit from 0.6 LTA to 1.0 LTA of M/s. Steel Authority of India Ltd.

23. Failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.
24. Nearby local village representative should be included as a member in the local management committee.
25. The above conditions will be enforced inter-alia, under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986 and the Public Liability Insurance Act, 1991 along with their amendments and rules made there under.

Yours faithfully,

(KANWERPAL)
Member Secretary
SEIAA

Copy to:

1. The Secretary, Ministry of Environment & Forests, Government of India, Paryavaran Bhavan, CGO Complex, Lodi Road, New Delhi – 110 003.
2. The Secretary, Department of Environment & Ecology, Government of Karnataka, Bangalore.
3. The Member Secretary, Karnataka State Pollution Control Board, Bangalore.
4. The CCF, Regional Office, Ministry of Environment & Forests (SZ), Kendriya Sadan, IVth Floor, E & F Wings, 17th Main Road, Koramangala II Block, Bangalore – 560 034.
5. The Regional Director (Environment), Department of Environment and Ecology, Government of Karnataka, APMC Building, Adi Udupi 576108, Udupi.
6. Guard File.

9

ANNEXURE NO. 4

KARTHIKAU K.
K.T. RAMACHANDRA

Government of India letter dated 09.5.2000.

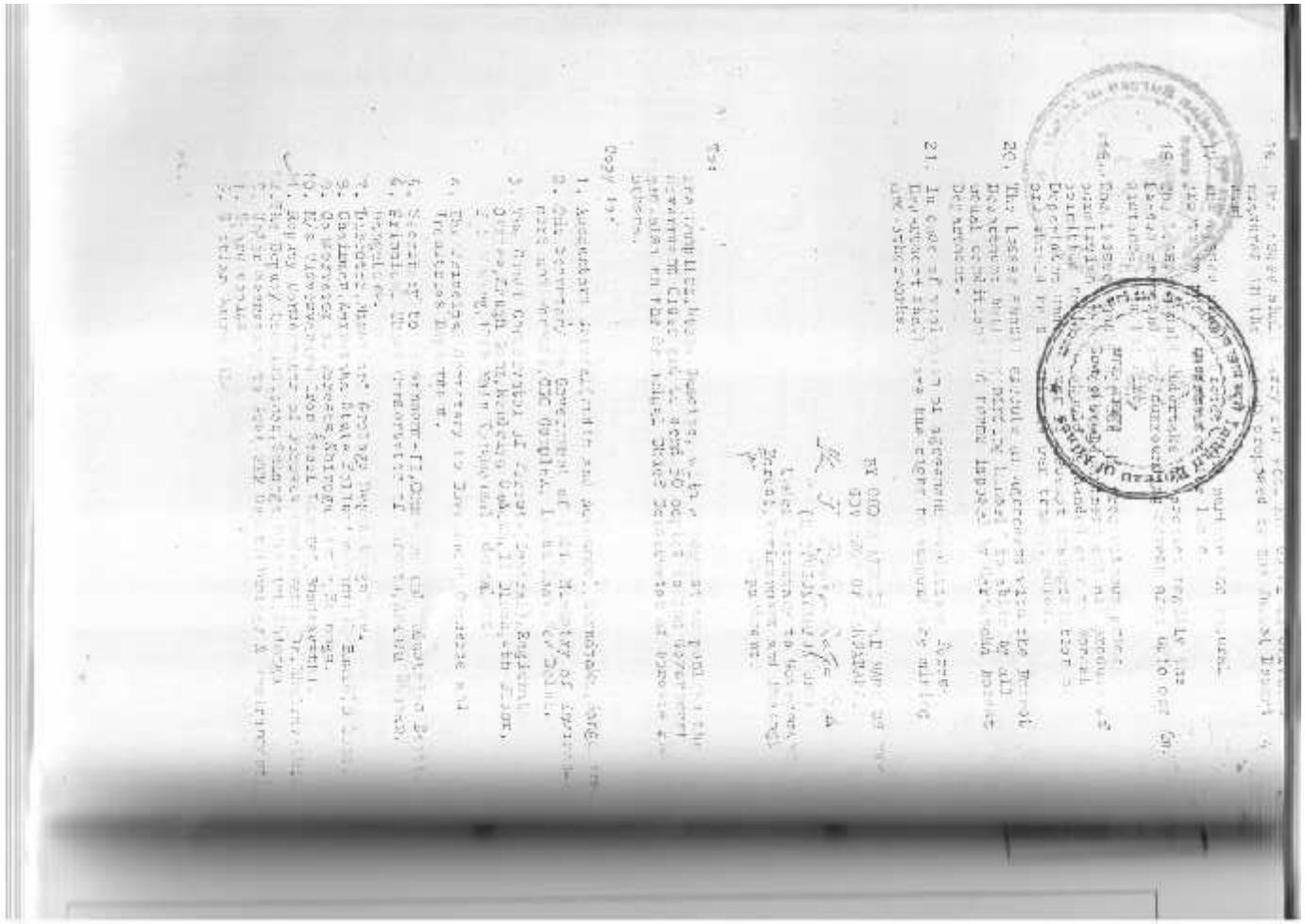
REMARKS

The Principal Chief Conservator of Forests in his letter ... 97.12 ha. at (1) above had sent proposal for diversion ... 40.12 ha. of forest land in Dahigaon for renewal of M.L. ... for extraction of limestone in the Dahigaon Range of ... Division of Chanda Circle in favour of M/s Visvesvaraya ... Iron and Steel Limited. It is also reported that out of ... total area measuring (97.12 ha.) the Company had agreed to ... the area measuring 57.00 ha. leaving the balance area requested ... for reservation of marine area 40.12 ha.

In the Government letter read at (2) above the proposal ... Union Government of forests, Surya Enclave ... Government of India for approval under Forest ... dated 1980 for the release of 40.12 ha. of forest land ... in favour of Visvesvaraya Iron and Steel Limited, subject to the conditions ... by the Principal Chief Conservator of Forests.

... the Principal Chief Conservator of Forests ... temporary working permission for a period of 5 months to ... working in already broken-up forest area.

...2



Abandoned leases held by M/s. VSL - SAIL

Sl. No.	Lease reference No. & Date	Name of the mine	Mineral	Area (in Ha)	Postal address / Location	Period of lease	Date of Expiry of lease	Status of Mine	Date of approval of MP/ SOM	Remarks
1	L.L. No. 2039	Kanchanpur Dwarka Mine	Quartz	4.4188	VSL PO Emc No. 135 BHMS & SAIL	1995/2001 to 2015/2021 Twenty years	18.05.2001	Working	275 / GG / EMG / 2000 dt. 27.12.2001	
2	L.L. No. 2040	Bhadrapalle Limestone Mine	Limestone	43.1200	do	1996/2002 to 2015/2021 Twenty years	3.03.2003	working	MSDMD Lr-615-02 dt. 27.06.2003	
3	L.L. No. 454	Kanchanpalli Iron Ore Mines	Iron ore	42.7500	do	Mining operation was stopped since duration from Wild Life, MOEF, New Delhi, from June, 2001 to renting is now previously to Tribunal vide Till Stockist	Non working	275/457/96 dt. 12.12.00	PMCE approved 3%OE/ENG/76-1-85 Dt. 25.3.2006	
			Total	87.2700						

K.T.RAMACHANDRA
HQP/BNG/040/00/A

KANTHARAJ K.
RQP/GOA/133/2000/P

ANNEXURE NO. 6

Bhadrigudda Limestone Mine of VISL - SAIL

DRILLED BOREHOLES DETAILS

Boreholes Drilled by M/S R V B C (Agency)

SL	BH.NO	CO-ORDINATES		DEPTH
		EASTING	NORTHING	(in m)
1	RBH-1	E 825	N 480	268.00
2	RBH-2	E 905	N 1040	162.35
3	RBH-3	E 1015	N 1900	100.00
4	RBH-4	E 960	N 830	189.24
5	RBH-5	E 885	N 1040	197.33
6	RBH-6	E1305	N 790	96.34
7	RBH-7	E 840	N 1900	26.37
8	RBH-8	E 840	N 1972	87.22
9	RBH-9	E 1120	N 840	86.33
10	RBH-10	E 1275	N 720	91.20
11	RBH-11	E 705	N 1020	91.23
12	RBH-12	E 1055	N 1055	356.30
13	RBH-13	E 1400	N 895	347.30
14	RBH-14	E 760	N 1020	91.25
	Total			1891.19

Boreholes Drilled by O M D (Core drill)

1	DBH1	E 1000	N 900	75.15
2	DBH-2	E 1395	N 760	58.00
3	DBH-3	E 1070	N 735	21.00
4	DBH-4	E 900	N 800	21.00
5	DBH-5	E 950	N 1000	21.00
6	DBH-6	E 1595	N 675	58.00
7	DBH-7	E 945	N 985	99.00
8	DBH-8	E 1085	N 860	39.00
9	DBH-9	E 980	N 1000	39.70
10	DBH-10	E 1125	N 840	18.00
11	DBH-11	E 1085	N 1085	40.00
12	DBH-12	E 575	N 915	21.70
13	DBH-13	E 1170	N 850	21.00
14	DBH-14	E 1200	N 765	75.00
15	DBH-15	E 1250	N 810	59.00
16	DBH-16	E 1135	N 945	24.70
17	DBH-17	E 1400	N 720	93.00
18	DBH-18	E 1445	N 760	48.00
19	DBH-19	E 1085	N 1035	39.30
20	DBH-20	E 1230	N 1010	32.00
21	DBH-21	E 1345	N 895	33.00
22	DBH-22	E 1295	N 835	39.00
23	DBH-23	E 1115	N 805	20.00
24	DBH-24	E 1330	N 800	40.00
25	DBH-25	E 1245	N 705	39.70
26	DBH-26	E 1350	N 745	60.00
27	DBH-27	E 1340	N 700	60.00
28	DBH-28	E 1310	N 1020	101.00
29	DBH-29	E 1385	N 975	84.00
30	DBH-30	E 1440	N 1055	96.30
31	DBH-31	E 1305	N 1075	90.00
32	DBH-32	E 1330	N 1050	96.00
33	DBH-33	E 1395	N 1025	81.00
34	DBH-34	E 1325	N 1080	87.00
35	DBH-35	E 1360	N 1090	132.00
36	DBH-36	E 1190	N 1120	45.00
37	DBH-37	E 1310	N 1155	57.00
38	DBH-38	E 1385	N 1115	294.00
39	DBH-39	E 1395	N 1090	191.00
	1208			4,648.16

ABSTRACT

SL No.	Details	No. of holes	Metreage Drilled
	CORE DRILL HOLE DRILLED BY		
1	RBH-14	14	1,891.19
2	DBH-39	39	4,648.16
	Total	53	6,539.35

KANTHARAJ K.
RQP/GOA/120/2000/A

K.T.RAMACHANDRA
RQP/ENG/040/88/A

ANNEXURE NO. 7

Borehole log of

Bhandigudda Limestone Mine

of

M/s. SAIL – VISL Bhadravathy.

KANTHARAJ K.
RQP/GOA/120/2000/A

K.T.RAMACHANDRA
RQP/ENG/040/88/A

Drilling interval		Run	Core	% of recovery	Type of rock	Grade of the ore sample		
From	To					Ca%	MgO	R2O3
0	1.2	1.5			Soil			
1.5	2.25	0.75	0.75	100	Light gray coarse grained high calcium limestone.	52.3	1.3	
2.25	4.85	2.55	1	39	Light gray coarse grained high calcium limestone.	50.56	2.32	
4.8	6.3	1.5	0.15	10	Light gray coarse grained high calcium limestone.	52.75	1.41	
6.3	8.1	1.8	1.65	92	Light gray coarse grained high calcium limestone.	53.28	1.4	
8.1	9.7	1.2	.2	89	Light gray coarse grained high calcium limestone.	52.61	1.51	
9.3	12.35	3.05	3.05	83	Light gray coloured grained high calcium limestone with thin bands of grey coloured calcite veins.	52.2	1.53	
						52.4	1.51	
						48.87	1.74	
12.35	15.3	3.83	2.83	82	Light grey coloured coarse grained high calcium limestone.	40.69	1.4	
						51.3	1.3	
						48.5	1.47	
15.2	17	1.8	.8	83	Light grey coloured coarse grained high calcium limestone.	52.2	1.9	
						50.1	2.31	
17	18.55	1.55	1.55	100	Light grey coloured coarse grained high calcium limestone.	50.28	2.31	
						50.07	2.82	
18.55	20.4	1.85	1.75	95	Light to dark grey coloured coarse grained, high calcium limestone with quartz vein and pyrite crystals.	49.55	2.01	
						50.56	1.53	
20.4	23.15*	2.75	2.2	98	Light grey to grey coloured high calcium limestone.	50.35	2.1	
						49.52		

26.95	28.5	1.55	1.55	100	Light grey to grey coloured high calcium limestone.	50.8	0.5	1.2
						51.53	2.01	
28.5	30	1.5	1	100	Light grey to grey coloured coarse grained high calcium limestone with patches of clay material.	51.65	1.51	
						51.2	2.11	1.16
						51.01	2.0	1.78
32	34.55	2.55	2.55	100	Grey coloured coarse grained high calcium limestone with patches of low magnesium limestone.	51.68	2.51	
						51.01	2.0	1.12
						52.02	1.61	
34.55	37.6	3.05	2.85	93	Light to dark grey coloured coarse grained, high calcium limestone except for 1 metre interval of the core which is magnesium limestone with quartz	49.84	2.1	1.34
						51.67	2.21	0.7
						38.68	18.38	
37.6	39.15	1.55	1.55	98	Greenish grey coloured high magnesium limestone along with quartz	25.07	20.16	
						27.68	18.95	2.16
39.15	39.85	0.7	0.7	100	Greenish grey coloured high magnesium limestone along with quartz.	25.68	20.38	7.8
39.85	42.9	3.05	2.9	95	Magnesium limestone with calcite	31.09	1.6	
						21.86	18.86	
						24.23	17.33	
42.9	45	2.1	2.1	100	Magnesium limestone with calcite	23.27	17.94	
						25.86	16.55	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
47.23	49.63	2.4	1.7	72	light magnesian limestone with calcareous materials.	24.87 24.76	10.13 12.89	
49.63	51.1	1.65	0.7	42	Grey coloured, fine grained magnesium limestone and the rock in the area consists of high calcium limestone.	34.99	4.41	
51.1	54.7	3.1	3.	100	Light grey coloured, coarse grained high calcium limestone.	32.07 32.62	1.81 1.41	
54.2	56.2	2	1.88	94	Light grey coloured, coarse grained high calcium limestone.	33.48 32.67	1.2 .31	
56.2	57.4	1.	1.15	57	Light grey coloured, coarse grained high calcium limestone.	33.58	1.1	
57.4	60.15	2.75	2.75	100	Light grey coloured, coarse grained high calcium limestone.	32.6 30.8	1.7 1.1	
60.15	63.29	3.1	3.14	69	Light grey coloured, coarse grained high calcium limestone.	32.36 31.5	1.2 .31	
63.29	66.15	2.9	2.9	100	Light grey coloured, coarse grained high calcium limestone with specks of pyrites	32.2 32.66 32.84	.26 .21 1.2	
66.15	69.15	3	3	100	Light grey coloured, coarse grained high calcium limestone with specks of pyrites	32.9 31.9	1.3 1.2	
69.15	72.25	3.1	3.	100	Light grey coloured, coarse grained high calcium limestone with specks of pyrites	32.9 33.76	1.4 1.	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
78.1	81.25	3.15	3	95	Light grey coloured, coarse grained high calcium limestone with specks of pyrites.	34.39 34.69	1.41 1.61	
81.25	83.75	2.5	2.5	100	Light grey coloured, coarse grained high calcium limestone with specks of pyrites.	31.22 31.83	1.61 1	
83.75	86.4	2.65	2.47	93	Light grey coloured, coarse grained high calcium limestone with specks of pyrites.	43.79 43.33	.71 2.01	
86.4	89.4	3.0	3.	85	Grey coloured. High calcium limestone and at the end of the section consists of dark grey fine grained magnesium limestone.	19.83 25.83	2.01 19.43	
89	91.8	2	1	50	High magnesium limestone with quartz and calcite veins	28.52 25.1	19.04 12.34	
91	93.65	1.75	1	57.4	High magnesium limestone.	45.3	2.22	0.83
93.65	94.65	2.2	1.54	67	High magnesium limestone and at the end of the section consists of high calcium limestone.	32.26 28.83	8.86 17.94	1.24 2.45
96.65	98.3	1.65	1.	57	Light grey to grey coloured, high calcium limestone.	49.68	2.11	0.3
98.3	97.95	1.65	1.55	94	High calcium limestone	48.13	2.01	1.06
97.95	100.35	2.4	2.5	93	High calcium limestone.	48.68 49 48.72	2.21 2.11 2.11	0.9 1
100.75	103.35	2.5	2.2	56	High calcium limestone.	48.85 49	2.07 2.21	

95.45	98.2	2.75	2.75	100	The beginning of the unit consists of high magnesium limestone (about 40cms) and the rest of the unit is high calcium limestone.	49.87	5.89	2.6
108.2	111	3.2	3.12	98	High calcium limestone.	48.77	2.11	.22
						46.33	2.92	.10
						46.75	7.63	.42
111.3	114.5	3.1	2.96	95	High calcium limestone.	45.98	3.83	1.6
						45.37	5.21	1.5
						49.24	5.84	1
114.5	116.35	2.45	2.05	83	High calcium limestone.	49.56	1.41	1
						49.38	5.63	0.4
6.55	119.8	2.85	2.61	92	High calcium limestone.	49.16	1.62	
						49.54	7.91	1.3
119.8	122.95	3.15	2.9	92	Grey, recrystallized and sheared high calcium limestone with patches of high magnesium limestone along with calcite & quartz.	49.84	2.61	0.81
						49.84	4.32	.2
						49.98	5.41	1.2
25.85	123.75	2.8	2.5	100	High calcium limestone.	48.99	2.61	0.54
						49.41	1.61	0.84
						48.79	1.61	
25.22	127.2	1.95	1.2	77	Grey, recrystallized and sheared high calcium limestone.	49.69	2.61	
125.7	133.6	2.9	2.5	86	Grey, recrystallized and sheared high calcium limestone.	47.38	7.41	
						47.48	7.61	

133.65	135.65	2	1.85	92	Grey, silicified fine grained high magnesium limestone.	45.05 31.85	18.95 13.51	3 2
135.65	138.5	2.95	2.75	93	Grey, silicified fine grained high magnesium limestone.	43.64 51.57 57.11	5.21 2.21 1.61	1.16 2 2.28
138.5	141.65	3.05	2.85	93	Grey, silicified, fine grained high magnesium limestone.	50.12 47.75 48.43	1.03 .91 7.41	.28 .76 3.76
14 .65	142.5	.95	1.75	90	In the beginning 1.10mts of the unit consists of high magnesium limestone and 1.75mts is mainly dyke intrusives.	28.92	9.22	1.68
145.1	144.5	1.9	1.8	86	Dyke			
146.9	145.5	0.9	1.4	100	Dyke			
145.5	146.9	1.4	1.1	78	Dyke			
146.9	148.25	1.35	1.35	100	Dyke			
148.25	149.2	1	1.1	86	Dyke			
149.2	150.2	0.85	1.6	76	Dyke			
150.2	151.2	1	1.8	90	Dyke			

The bore hole was closed at a depth of 151.20 mts.

Drilling interval		Run	Core	% of recovery	Type of rock	Remarks	
From	To					CaO%	MgO%
0	10.05	0.05			sludge		
10.05	11.25	1.2	1.2	80	Light gray, coarse grained high calcium limestone.	51.95	1.61
11.25	20.33	9.08	9.08	100	Light gray, coarse grained high calcium limestone.	50.8	1.95
20.33	21.33	1	0.85	85	Light gray, coarse grained low calcium limestone	26.85	17.15
21.33	25.58	4.25	4.25	100	Light gray, coarse grained high calcium limestone.	50.95	1.86
25.58	31.68	6	6	100	Grey colour, coarse grained high calcium limestone.	52.05	1.62
31.68	34.68	3	3	100	Grey colour, coarse grained high calcium limestone.	52.05	1.41
34.68	37.73	3.05	2.97	97	Grey colour coarse grained high calcium limestone with thin patches of slaty material.	51.56	2.18
37.73	43.78	3.05	3.05	100	Grey colour coarse grained high calcium limestone with thin patches of slaty material.	51.85	2.31

40.78	43.83	3.05	3	98	Grey coloured limestone and the rock of the core is high magnesium limestone	51.95	1.78
43.83	45.38	3.05	27	98	Gray colored, medium grained high magnesium Limestone	51.95	1.78
46.88	65.43	18.55	17.93	96	Dolomitic dyke		
55.45	130.00	64.57	63.80	28	Dolomite dyke		
HOLE CLOSED AT 120 mts.							

Drilling interval		Run	Core	% of recovery	Type of rock	Analysis		
From	To					CaO	MgO	R_2O_3
0.00	19.20				Soil			
9.20	21.50	2.30	2.00	87	Light grey, coarse	51	0.89	--
21.50	23.00	1.50	1.25	83	Light grey, coarse grained high calcium	48.71	2.21	
23.00	26.10	3.10	2.80	90	Light grey, coarse grained high calcium	48.71	3.02	
26.10	34.94	8.84	8.25	92	Light grey, coarse grained high calcium limestone	48.85	2.01	
34.95	37.65	2.70	2.70	100	Gray colour, coarse grained high calcium limestone	47.13	2	
37.65	42.60	4.95	4.80	94	Gray colour, coarse grained high calcium limestone	47.3	1.76	
42.60	48.70	6.45	6.45	100	Gray colour coarse grained high calcium limestone with thin	49.7	1.85	
48.75	55.75	8.10	7.80	97	Gray colour coarse grained high calcium limestone with thin	48.12	1.65	
55.25	61.17	9.92	5.50	96	In the beginning (About 60cm) of the run consist of high	50.12	0.78	
61.17	67.62	6.45	1.30	100	Gray colored, medium grained high magnesium limestone	45.12	3.8	
67.62	77.62	10.00	9.90	99	Gray colored, medium grained low magnesium limestone	43.15	3.12	

93.62	99.35	5.70	5.70	100	The beginning of the run (about 50cms) consists of gray	48.2	1.9	
99.35	105.35	6.00	5.90	98	The beginning of the run (about 50cms) consists of gray	50.1	1.2	
105.35	111.35	6.00	6.00	100	The beginning of the run (about 50cms) consists of gray	51	0.9	
111.35	117.95	6.60	5.80	96	The beginning of the run (about 50cms) consists of gray	50.1	0.7	
117.95	121.00	3.05	3.05	100	The beginning of the run (about 50cms) consists of gray	53.15	0.6	
121.00	131.70	10.00	5.50	99	The beginning of the run (about 50cms) consists of gray	45.7	1.9	
131.70	137.32	5.60	5.60	100	The beginning of the run (about 50cms) consists of gray	46.1	2.1	
137.32	145.80	8.35	5.25	98	The beginning of the run (about 50cms) consists of gray	45.1	1.9	
145.65	151.83	6.18	5.00	96	The beginning of the run (about 50cms) consists of gray	46.61	4.12	
151.83	154.67	2.84	2.84	100	The beginning of the run (about 50cms) consists of gray	49.97	2.72	
154.67	164.26	9.70	9.50	98	The beginning of the run (about 50cms) consists of gray	48.16	2.1	

[illegible]	168.95	5.00	5.00	98	The beginning of the run (about 50cms) consists of gray	48.16	5.2	
168.95	174.00	5.05	5.00	99	The beginning of the run (about 50cms) consists of gray	45.2	5.8	
174.00	178.00	4.00	4.00	100	The beginning of the run (about 50cms) consists of gray	48.96	5.6	
178.00	183.14	5.40	5.20	96	The beginning of the run (about 50cms) consists of gray	44.66	4.43	

Hole closed at 183.14 mts.

Drilling interval		Run	Core	% of recovery	Type of rock	Analysis		
From	To					CaO	MgO	R_2O_3
0.00	29.25	29.25			Shales			
29.25	30.55	1.3	1.3	100	Grey coloured, coarse grained, high calcium lime stone.	52.05	2.01	0.97
30.55	33.6	3.05	2.6	85	Grey coloured, coarse grained, high calcium lime stone	51.79	2.01	0.80
						52.21	1.61	0.80
33.6	36.65	3.05	2.6	85	Grey coloured, coarse grained, high calcium lime stone.	51.79	2.01	0.80
						52.13	1.61	0.80
36.62	39.7	3.05	2.7	88	Grey coloured, coarse to medium, grained high calcium lime stone	50.55	1.61	1.32
						49.55	2.01	1.42
						50.81	1.61	1.60
39.7	42.75	3.05	3.05	100	Grey coloured, coarse to medium, grained high calcium lime stone.	51.79	1.61	0.72
						47.59	1.87	1.12
						51.23	2.01	1.44
42.75	45.8	3.05	3.05	100	Grey coloured, coarse to medium, grained high calcium lime stone.	49.68	2.11	1.93
						50.12	2.11	1.23
						50.37	2.01	1.43
45.8	48.85	3.05	3.05	100	Grey coloured, coarse to medium, grained high calcium lime stone.	51.38	1.61	
						50.11	2.11	
						51.95	1.61	
48.85	51.85	3.00	3.00	100	Grey colour, medium grained, high calcium lime stone with thin patches of Magnesium lime stone (low magnesium)	50.84	1.51	
						50.68	1.49	

56.45	59.45	3.05	2.85	93	[illegible] medium grain of high calcium lime stone	[illegible]	[illegible]	[illegible]
						51.58	1.29	2.0
59.45	62.50	3.05	3.00	98	Grey coloced, medium grained high calcium lime stone	50.67	2.61	1.00
						47.58	2.72	1.40
						47.63	2.61	.98
62.50	65.50	3.00	3.00	100	Light gray coarse grained high calcium lime stone	49.11	2.31	1.3
						47.73	3.02	1.1
						45.21	6.74	
65.50	68.55	3.05	3.05	100	Gray coloured medium grained hihg calcium lime stone with small patches of magnesium lime stone (low magnesium pyrites specks can be seen in low magnesium lime stone)	52.53	1.81	.29
								.80
								.20
68.55	71.60	3.05	2.00		Gray coloured, coarse to medium, grained high calcium lime stone.	42.89	7.75	.00
						47.94	1.71	
71.6	74.55	3.05	2.90	95	Gray colour coarse to medium grained high calcium lime stone dained with low magnesium lime stone	49.27	1.71	.10
74.65	76.15	1.50	1.50	100	Gray colour coarse to medium grained high calcium lime stone dained with low magnesium lime stone			.90
76.15	79.2	3.05	1.85	60	Gray coloured, medium grained high calcium lime stone with low magnesium lime stone	45.92	2.33	.80
						44.66	3.08	.80
79.20	80.70	1.50	1.00	66	Gray coloured, medium grained high calcium lime stone with low magnesium lime stone.	45.88	3.(2	.40
80.7	83.75	3.35	0.2	9	Magnesium lime stone			
83.95	86.1	3.05			Sludge			

86.10	87.60	1.50	0.25	14.6	Magnesium lime stone (low) light gray, medium grained high calcium lime stone	51.30	1.30	1.20
87.60	89.80	2.0	0.25	14.07				
89.7	90.95	1.25	0.13	8.4	Magnesium lime stone (low)			
90.95	91.30	2.05	2.03	98	Gray coloured, medium grained high calcium lime stone	50.41	2.10	1.00
						49.71	2.10	4.60
94.02	97.12	3.12	3.10	103	Gray coloured, medium grained high calcium lime stone with calcite	51.37	1.60	7.80
						49.13	1.31	1.20
97.12	100.15	3.03	3.09	100	Gray coloured, medium grained high calcium lime stone.	48.95	2.11	1.60
						48.96	2.21	1.40
						49.69	1.31	0.96
100.15	103.2	3.05	3.05	100	Gray coloured, medium grained high calcium lime stone.	51.23	1.61	0.8
						51.5	2.81	1
						52.07	2.01	3.66
103.2	106.25	3.05	2.90	95	Gray coloured, medium grained high calcium lime stone.	50.12	2.31	2.4
						48.63	2.42	1.50
106.25	108.05	1.8	1.8	100	Gray coloured, medium grained	51.51	2.21	1.56
108.05	111.1	3.05	3.05	100	Gray coloured, medium grained high calcium lime stone.	50.15	2.11	1.24
						48.99	2.41	2.52
						52.07	2.61	
111.1	113.5	2.50	2.50	100	Gray coloured, medium grained high calcium lime stone.	50.4	2.11	1.80
						56	2.72	4.00
113.6	116.15	2.55	2.50	98	Gray coloured, medium grained high calcium lime stone.	50.3	2.01	1.30
						50.6	2.11	2.10
116.15	118.75	2.60	2.60	100	Gray coloured, medium grained high calcium lime stone.	50.82	2.31	1.60
						50.03	1.61	2.30
118.75	121.75	3.00	3.00	100	Light grey to grey coarse to medium grained high calcium lime stone	50.56	2.11	2.0
						51.65	2.61	2.00
						50.95	2.61	0.90
121.75	124.02	2.31	2.31	100	Gray coloured, medium grained high calcium lime stone.	50.81	2.11	2.12
						51.55	1.61	1.60
124.08	125.05	1.00	1.00	100	Gray coloured, medium grained high calcium lime stone.	51.09	1.61	1.40

125.05	128.15	3.10	3.10	00	Gray coloured, medium grained high calcium lime stone	51.46	1.41	1.11
						51.63	1.51	0.90
128.15	131.2	3.05	3.03	00	Light gray to gray coarse to medium grained high calcium lime	50.52	1.31	1.80
						52.49	1.51	0.10
131.2	134.2	3.00	3.03	00	Gray coloured, medium grained high calcium lime stone.	51.93	1.51	0.60
						49.53	2.21	1.68
134.2	137.25	3.05	3.03	00	Light gray to gray coarse to medium grained high calcium lime	50.1	2.41	1.30
						50.39	2.21	1.10
137.25	140.3	3.05	2.95	97	Gray coloured, medium grained high calcium lime stone.	51.25	2.41	1.00
						50.95	2.41	1.82
						51.24	2.11	1.54
140.3	143.35	3.05	3.00	98	Gray coloured, medium grained high calcium lime stone.	51.63	1.31	
						50.4	2.11	1.40
143.35	146.4	3.05	3.00	98	Gray coloured, medium grained high calcium lime stone.	50.1	2.72	1.28
						50.1	2.01	1.24
146.4	147.6	1.20	1.20	100	Gray coloured, medium grained high calcium lime stone.	48.86	2.31	2.10
147.6	150.6	3.00	3.00	100	Gray coloured, medium grained high calcium lime stone.	49.83	2.01	1.16
						51.27	1.51	1.64
150.6	153.65	0.05	3.05	100	Gray coloured, medium grained high calcium lime stone.	50.12	2.11	
						51.22	2.21	1.30
153.65	156.7	3.05	3.05	100	Gray coloured, medium grained high calcium lime stone.	51.23	1.91	0.80
						51.23	1.91	1.36
156.7	159.6	2.90	2.90	100	Gray coloured, medium grained high calcium lime stone.	50.11	1.81	1.20
						48.91	1.71	1.10
159.6	162.4	2.80	2.80	100	Gray coloured, medium grained high calcium lime stone.	52.18	1.61	1.00
						51.5	1.61	2.00
162.4	164.8	2.10	2.10	97	Gray coloured, medium grained	50.3	1.71	1.70
164.8	167.95	3.15	3.10	98	Light grey to gray course to medium grained high calcium lime stone	49.55	1.0	1.19
						49.55	1.0	1.40

164.8	167.95	3.15	3.15	58	Light gray to grey coarse to medium grained high calcium Lime stone	49.55	1.91	0.9
						49.55	1.91	1.40
167.95	171.15	3.20	3.20	6	Light gray to grey coarse to medium grained high calcium Lime			
171.158	172.85	1.70	1.70	100	Gray coloured, medium grained high calcium lime stone.	45.71	1.91	1.44
172.85	175.9	3.05	2.85	93	Gray coloured, medium grained high calcium lime stone.	46.2	2.31	1.9
						46.08	2.11	1.80
175.9	178.95	3.05	2.00	65	Gray coloured, medium grained high calcium lime stone.	48.46	2.21	1.50
178.95	182.00	3.05	1.70	55	Gray coloured, medium grained high calcium lime stone.	49.23	2.41	1.30

Angle vertical For prospecting for lime stone

Drilling interval		Run	Core	% of recovery	Type of rock	Analysis		
From	To					CaO	MgO	R_2O_3
0	1.35	1.5			Soil			
1.35	1.54	0.22	0.22	100	Light gray, coarse grained high calcium limestone.	46.47	4.93	–
1.54	1.81	0.27	0.27	100	Light gray, coarse grained high calcium limestone.	48.72	2.33	–
1.81	2.14	0.33	0.33	100	Light gray, coarse grained high calcium limestone.	48.71	3.02	
2.14	2.44	0.3	0.3	100	Light gray, coarse grained high calcium limestone.			
2.44	2.76	0.32	0.32	100	Grey colour coarse grained high calcium limestone.			
2.76	3.1	0.34	0.34	100	Grey colour coarse grained high calcium limestone.			
3.1	6.1	3	3	100	Gray colours coarse grained high calcium limestone with thin patches of slaty material			
6.1	8.1	2	2	100	Gray colours coarse grained high calcium limestone with thin patches of slaty material.			
8.1	9.6	1.5	1.5	100	In the beginning (About 60cm) of the run consist of high calcium limestone and the rest of the run is high magnesium limestone			
9.6	10.5	1	1	100	Gray colored, medium grained high magnesium limestone			
10.6	12.40	1.8	1.80	100	Gray colored, medium grained high magnesium limestone			

12.40	13.40	1.00	1.00	[illegible]	the run limestone of coarse grained high calcium limestone.			
15.40	18.4	3	3	100	Light grey to gray, coarse grained high calcium lime stone with calcite specks of pyrite can be seen at some places.	48.09	2.9	
						46.28	2.31	
18.4	20.00	1.6	1.6	100	Grey colour medium to coarse grained high calcium limestone with thin patches of slaty material.	47.47	2.43	
						48.42	2.86	
20	23	3	3	100	Light gray to gray, coarse grained high calcium limestone with calcite specks of pyrite can be seen at some places.	47.31	3.02	
						48.71	3.02	
23	26	3	3	100	Gray colour, medium grained high calcium limestone with thin patches of slaty material	47.31	3.1	
						48.79	3.52	2.52
26	29	3	2.9	97	Grey colour, medium grained high calcium lime stone with thin patches of slaty materia.,	43.9	3.52	
						46.19	3.26	
25.30	32.00	3.00	2.85	95	Light gray to gray coarse grained high calcium limestone.	50.34	2.15	
						46.55	2.9	
32	35	3	3	100	Light gray, coarse grained high calcium limestone with thin bands of grey vanity of limestone.	46.23	2.41	
						25.55	2.92	
35	38	3	2.7	90	Light gray, coarse grained high calcium limestone with thin patches of magnesium limestone and calcite.	48.27	3.02	
						48.72	3.3	
38.00	41.00	3.00	3	100	Light to dark gray, coarse to medium grained high calcium lime stone with thin patches of Schistose material.	48.43	3.02	
						47.15	3.62	

41.00	44.00	3.00	3	100	Light gray to gray coarse grained high calcium limestone with thin patches of slaty material.	48	2.9	
						48.15	3.16	
44	47	3	3	100	Light gray to grey course to medium grained high calcium limestone with thin patches of schistose material and calcite	47.38	2.45	
						47.44	4.13	
47	50.30	3	2.7	73	Light gray, coarse grained high calcium limestone.	50.6	2.45	
						50.96	2.07	
50.00	53	3	3	100	Light gray, to gray course grained high calcium limestone with thin patches of slaty material. Pyrites specks can be seen in slaty material	43.79	3.2	
						45.47	4.23	
53	56	3	3	100	Light gray to grey course grained high calcium limestone mixed with low magnesium limestone.	48.15	2.41	
						48.43	3.48	
55	59	3	3	100	Light gray coarse grained high calcium limestone mixed with low magnesium limestone.	44.23	3.24	
						42.82	3.89	
59	62	3	2	56	Light to dark gray course grained high calcium limestone mixed with slaty material and calcite.	43.67	2.92	
						46.18	2.82	
62	63.25	1.25	0.85	68	Light gray, coarse grained high calcium limestone mixed with clay material	45.91	2.92	
63.25	66.25	3	3	100	Light gray to grey course to medium grained high calcium limestone. At places it is mixed with Schistose material.	49.53	2.01	
66.25	69.25	3	3	100	Light gray to grey course to medium grained high calcium limestone. At the end of the run limestone is mixed with calcite quartz and slaty material	44.99	2.23	
						46.64	1.89	
69.25	72.35	3.1	2.4	77	Light gray, course grained high calcium limestone mixed with calcite and slaty	47.87	1.51	
						49.48	2.1	

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Light grey coarse grained high calcium limestone with thin patches of clay material here and there.	48.7	1.92	
78.35	81.45	3.1	3.1	100	Light gray, coarse grained high calcium limestone with bands of slaty materia.	48.57	1.52	
						45.07	3.52	
81.45	84.45	3	1	100	Light gray to gray coloured coarse to medium grained high calcium limestone with calcite and slaty material	47.6	3.01	
						43.39	3.72	
84.45	87.15	2.7	2.5	92	Light gray, coarse grained high calcium limestone with bands of gray variety of limestone.	46.2	7.56	
						48.3	2.11	
87.15	90.15	3	3	100	Light gray, coarse grained high calcium limestone with bands of gray variety of limestone.	46.47	2.41	
						46.19	2.52	
90.15	93.05	2.9	2.4	92	Light to dark gray coarse to medium grained high calcium limestone.	46.19	2.52	
						45.88	3.82	
93.05	95.85	2.8	2.4	96	Light grey to dark gray coarse to medium grained high calcium limestone.	46.72	3.00	
						46.76	2.31	
95.85	98.85	3	3	100	Light grey to dark gray coarse to medium grained high calcium limestone.	44.93	3.22	
						47.85	3.01	
98.85	99.35	0.5	0.6	100	Light grey, coarse grained high calcium limestone.	48.01	2.92	
99.35	99.45	0.1	0.1	100	Light gray, coarse grained High calcium limestone.			
99.45	101	1.55	1.4	96	Light gray, coarse grained high calcium limestone.	47.87	2.21	9.08
101	104	3	2.7	93	In the beginning (About 40cm) consists of light grey, coarse grained high calcium limestone and the rest of the run is medium grained high magnesium limestone.	30.07	13.85	
						34.82	13.81	

104	105	1	0.6	60	Drak gray fine grained high magnesium limestone.	28.74	19.4	4.2
105	106.5	1.5	1	66				
106.5	108.25	1.75	1.7	97	Drak gray colour, fine grained High magnesium limestone mixed with thin bands of high calcium limestone.	25.52	9.27	21.6
108.25	109.45	1.2	0.46	39				
109.45	110.65	1.2	0.65	54	Gray coloured medium grained high magnesium limestone.	24.88	19.95	
110.65	113.65	3	1.5	50	Gray coloured medium grained high magnesium limestone.	25.7	20.47	4.36
113.65	115.82	2.17	1.37	49	Gray coloured medium grained high magnesium limestone.	25.79	21.76	3
115.82	117.32	1.5	1.00	66	Grey colour fine grained high magnesium limestone.	26.4	19.16	1.02
117.32	120.32	3	0.3	10	Gray colour fine grained high magnesium limestone.	26	20.3	1.4
120.3	120.93	0.61	0.42	69				
120.93	122.93	3	1.5	50	Light gray, medium grained high magnesium limestone.	21.84	18.77	16.72
122.93	126.93	3	1.93	65	Light gray, medium grained high magnesium limestone.	22.19	18.31	17.44
						21.86	18.57	9.68
126.93	129.93	3	0.75	25	Light gray, medium grained high magnesium limestone	38.46	10.18	
129.93	132.93	3	1.4	47	Light gray, coarse grained High calcium limestone mixed with medium magnesium limestone.	41.7	8.66	
132.93	135.93	3	1.15	38	Light gray, medium grained high magnesium limestone.	24.71	8.35	

138.93	141.36	2.43	0.3	12	limestone.			
141.36	142.36	1	0.8	80	Light grey, medium grained high magnesium limestone.	17.46	15.72	5.6
142.36	143.36	3.1	0.84	84	Light grey, medium grained high magnesium limestone.			
142.36	143.67	0.06	0.36	100	Light grey, medium grained high magnesium limestone.	14.36	13.5	
143.42	144.08	0.66	0.4	86	Light grey, medium grained high magnesium limestone.	11.46	10.62	
144.08	147.68	3	2.45	82	Light grey, medium grained high magnesium limestone.	18.13	14.31	
47.08	147.5	0.42	0.3	22	Light grey, medium grained high magnesium limestone.	11.87	10.39	2

B.H.No-1 Location Main Quarry							
Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
In mts From	to	core in mts					
0	2.75	2.75	High CaO limestone	1.9	49	1.9	
2.75	5.75	3	High CaO limestone	0.85	50.5	1	--
5.75	9	3.25	High CaO limestone	0.55	51.5	0.78	--
9	10.6	1.6	High CaO limestone	1	50.6	2.11	--
10.6	18.5	7.9	Low CaO limestone	3.15	29.33	14.2	--
18.5	15	3	High CaO limestone	0.7	54.34	0.72	--
21	18.3	3.3	High CaO limestone	0.48	54	1.01	--
24.7	21.3	3	High CaO limestone	0.44	51.8	1	--
27.7	24.3	3	High CaO limestone	0.3	53	1.1	--
30.7	33.8	3	High CaO limestone	0.32	53.4	1.2	--
33.8	40	6.2	High CaO limestone	0.52	53.5	0.75	--
40	43	3	High CaO limestone	0.8	51.6	0.92	--
43	45	3	High CaO limestone		51.2	1.04	--
46	49	3	High CaO limestone	0.6	51.4	0.96	--
49	52	3	High CaO limestone	0.76	51.8	2	--
52	55	3	High CaO limestone	0.48	53.8	1.16	--
55	58.1	3.1	High CaO limestone	0.4	52.8	1.24	--
58.1	61	2.9	High CaO limestone	1.12	51.8	1.24	--
61	64	3	High CaO limestone	0.7	51.4	1.32	
64	67	3	High CaO limestone	1.2	52.8	1.35	--
67	70	3	High CaO limestone	0.9	52.7	0.94	--
70	73.1	3.1	High CaO limestone	1.92	47.1	2.1	--
73.1	76.1	3	High CaO limestone	1	52.4	0.97	--
76.1	79.2	3.1	High CaO limestone	1.5	50.1	2.53	--
Hole closed at 79.2 mts							

Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
In mts from	to	core in mts					
0	0.5	0.5	High CaO limestone	0.5	47.6	2.49	--
0.5	3	2.5	High CaO limestone	0.3	53.7	0.43	--
3	6	3	High CaO limestone	0.65	52.37	0.78	--
6	9	3	High CaO limestone	0.3	50.9	1.74	--
9	12	3	High CaO limestone	0.3	51.6	1.45	--
12	15	3	High CaO limestone	0.7	54.34	0.72	--
15	18.3	3.3	High CaO limestone	0.48	54	1.01	--
18.3	21.3	3	High CaO limestone	0.44	51.8	1	--
21.3	24.3	3	High CaO limestone	0.3	53	1.1	--
24.3	27.3	3	High CaO limestone	0.32	53.4	1.2	--
27.3	30.3	3	High CaO limestone	0.52	53.5	0.75	--
30.3	33.5	3.2	High CaO limestone	0.8	51.6	0.92	--
33.5	36.5	3	High CaO limestone	1	51.2	1.04	--
36.5	39.5	3	High CaO limestone	0.6	51.4	0.96	--
39.5	42.5	3	High CaO limestone	0.8	52.6	0.57	--
42.5	45.75	3.2	High CaO limestone	0.48	53.8	1.16	--
45.75	48.75	3	High CaO limestone	0.4	52.8	1.24	--
48.75	51.7	3	High CaO limestone	1.12	51.8	1.24	--
51.7	54.7	3	High CaO limestone	0.7	51.4	1.32	--
54.7	62.3	7.6	High CaO limestone	1.2	52.8	1.35	--
62.3	64	1.7	High CaO limestone	0.9	52.7	0.94	--
64	67	3	High CaO limestone	0.8	51.7	1.3	--
67	70	3	High CaO limestone	1	52.4	0.97	--
70	73	3	High CaO limestone	1.5	50.1	2.45	--
73	76	3	High CaO limestone	2.8	51.57	1.1	--
76	79	3	High CaO limestone	2.34	42.46	2.39	--
79	83	4	High CaO Limestone	1.2	49.1	1.66	--
Hole closed at 83.20mts							

Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
In mts from	to	core in mts					
0	0.91	0.91	No core sludge	--	--	--	--
0.91	3.96	3.05	High calcium limestone	--	--	--	--
3.96	7	5.04	High calcium limestone	3.6	52.21	0.75	--
7	9.75	2.75	High calcium limestone	--	48.88	1.2	--
9.75	12.8	3.05	High calcium limestone	--	47.19	2.31	--
12.8	15.8	3	High calcium limestone	--	49.83	2.4	--
15.8	18.8	3	High calcium limestone	1.05	51.88	1.5	--
18.8	22	3.2	High calcium limestone	--	52.45	0.92	--
22	23.5	1.5	High calcium limestone	--	51.59	2.3	--
23.5	26.5	3	High calcium limestone	--	53.92	0.7	--
26.5	29.5	3	High calcium limestone	--	49.83	2.21	--
29.5	32.5	3	High calcium limestone	--	50.81	1.51	--
32.5	49	16.5	No core sludge	--	49.82	2.01	--
49	52	3	High calcium limestone	51.36	--	--	Faultles zone
52	56.3	4.3	No core sludge	--	0.01	--	--
Hole closed at 56.38mts							

B.H. No. 17 Location mine Quarry

Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
in mts from	to	core in mts					
0	3.4	3.4	High calcium limestone	2	50.8	10.08	--
3.4	6.4	3	High calcium limestone	1.2	53.6	1.37	--
6.4	9.5	3.1	High calcium limestone	0.9	52.1	0.8	--
9.5	12.5	3	High calcium limestone	1	50	1.22	--
12.5	15.5	3	High calcium limestone	0.8	53.2	1.29	--
15.5	21.5	6	High calcium limestone	0.8	45.38	1.07	--
21.5	24.5	3	High calcium limestone	1.33	45.32	0.8	--
Hole closed at 24.5mts							

Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
In mts from	to	core in mts					
0	3.4	3.4	Low grade limestone	--	38.01	5.4	--
3.1	6.5	2.1	Grey coloured limestone	--	49.15	1.84	--
6.5	9.5	3	Grey coloured limestone	--	55.15	2.52	--
9.5	12.5	3	Grey coloured limestone	--	35.43	17.91	High MgO
12.5	21.6	5.1	Grey coloured limestone	2.1	47.8	2.79	--
21.6	24.6	3	Grey coloured limestone	--	41.97	2.2	--
24.6	27.6	3	Grey coloured limestone	3.3	28.39	17.16	High MgO
27.6	30.8	3.2	Grey coloured limestone	--	49.41	2.32	--
30.8	33	2.2	Grey coloured limestone	--	49.61	1.84	--
					49.15	2.32	--
Hole closed at 33mts							

B.H. No.: DBH-5 location Post Quarry

Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
In mts From	to	core in mts					
0	1	1	High calcium limestone	2.5	49.2	2.1	--
1	3	2	High calcium limestone	2	46.5	2.25	--
3	6.4	3	High calcium limestone	1.5	48.4	2.4	--
6.4	10	2.5	High calcium limestone	1.7	50	1.5	--
10	11.5	1.5	High calcium limestone	1.5	47.3	1.52	--
11.5	15	3.5	High calcium limestone	1.6	49.5	1.2	--
15	18	3	High calcium limestone	2.2	49.5	0.92	--
18	21	3	High calcium limestone	1.9	48.5	1.5	--
21	24	3	High calcium limestone	1.5	46.8	2.1	--
24	27.4	3	High calcium limestone	1.9	46.46	3.25	--
27.4	30.4	3	High calcium limestone	4.4	32	11.12	Mg limestone
30.4	33.5	3.1	High calcium limestone	1	51.4	0.56	--
33.5	36.5	3	High calcium limestone	1.8	50.8	1.08	--
36.5	39.5	3	High calcium limestone	0.9	53.1	0.84	--
39.5	47	7.5	High calcium limestone	2.4	45.3	2.52	--
47	55.8	8.8	High calcium limestone	4.6	31.8	15.51	High MgO
55.8	57.5	1.7	High calcium limestone	2.18	45.6	3.22	High MgO
Hole closed at 57.5 mts							

Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
In mts from	to	core in mts					
3.00	3.00	3.00	Dolerite	--	35.8	11.30	High MgO
3.00	6.00	6.00	Dolerite	--	31.30	16.15	High MgO
6.00	8.80	2.80	Dolerite	--	30.10	17.20	High MgO
8.80	12.50	3.70	Dolerite	--	33.15	18.10	High MgO
12.50	15.50	3.00	Dolerite	--	32.16	17.20	High MgO
15.50	18.50	3.00	Dolerite	--	34.16	15.80	High MgO
18.50	21.50	3.00	Dolerite	--	33.85	17.30	High MgO
21.50	24.00	2.50	Dolerite	--	37.61	16.20	High MgO
24.00	27.00	3.00	Dolerite	--	35.10	18.35	High MgO
27.00	30.00	3.00	Dolerite	--	30.70	17.80	High MgO
30.00	37.00	7.00	Dolerite	--	31.10	16.80	High MgO
37.00	40.00	3.00	Dolerite	--	38.90	14.30	Low MgO
40.00	46.00	6.00	Dolerite	--	36.15	16.20	High MgO
6.00	52.00	6.00	Dolerite	--	34.75	15.20	High MgO
Hole closed at 52 mts							

B.H. No: DBH-19 Location main Quarry

Drilling depth			LITHOLOGY	R_2O_3	CaO	MgO	Remarks
In mts from	to	core in mts					
0	3	3	Low grade limestone	3	30.48	17.6	--
3	6.4	3.4	Limestone	1.02	51.52	1.16	--
6.4	9.4	3	Limestone	--	54.35	1.51	--
9.4	12.4	3	Limestone	--	55.17	1.41	--
12.4	15.5	3.1	Limestone	--	53.87	0.7	--
15.5	18.6	3.1	Grey limestone	--	53.6	0.75	--
18.6	28.3	9.7	Grey colour limestone	0.4	54.55	0.22	--
28.3	31.4	3.1	Grey limestone	0.52	53	0.28	--
31.4	36.9	5.5	Grey limestone	0.18	53.87	1.01	--
36.9	39.9	3	Grey colour limestone	0.4	53.68	1	--
39.9	42.9	3	Grey colour limestone	0.6	54.58	1.2	--
42.9	46	3.1	Grey colour limestone	0.98	51.2	2.2	--
Hole closed at 46.0 mts							

B.H.No.: DBH-56 Location East Quary

Drilling depth in mts From	To	core in mts	LITHOLOGY	K_2O_3	CaO	MgO	Remarks
0	46	46	No core soil	--	--	--	--
46	48.75	2.75	Light gray Limestone	2	51.21	2.25	--
48.75	50.25	1.5	Light gray limestone	--	53.9	1.1	--
50.25	53.25	3	Light gray limestone	--	53.62	1.41	--
53.25	56.25	3	Light gray limestone	--	52.61	0.51	--
56.25	59	2.75	Light gray limestone	--	53.71	1.11	--
59	62	3	Light gray limestone	--	49.68	1.71	--
62	71.6	9.6	No core shales	--	--	--	--
Hole closed at 71.60mts							

B.H.No.: DBH-57 Location East Quary

Drilling depth in mts From	To	core in mts	LITHOLOGY	K_2O_3	CaO	MgO	Remarks
0	15	15	No core soil	--	--	--	--
15	19.4	4.4	High calcium limestone	1.2	51.36	19.1	--
19.4	19.8	2.3	Greenish gray limestone	--	25.21	17.85	High MgO limestone
19.8	24.3	4.5	High calcium limestone	--	47.6	21.51	--
24.3	33	10.7	High Magnesium limestone	--	35.8	17.2	--
33	31.5	16.5	High Magnesium limestone	3.5	30.16	13.9	--
31.5	34.9	3.4	High calcium limestone	3	42	7.8	--
Hole closed at 34.90mts							

Geol. Survey of India
Govt. of India

Essen & Co.

ISO 9001 : 2008 Certified Company

ANALYTICAL CHEMISTS & ASSAYERS

No. 106, 8th Main Road,
3rd Main Cross,
Malleswaram West,
BANGALORE 560 055.

Founded by : D. N. JAYARAMAN, M.A., D.Sc.
Director : Dr. J. RAJARAM

Geol. Survey of India

COPY

CERT NO. AN / 7523 DATE OF ISSUE 31.12.2012

REGD NO. 9197 DATE OF RECEIPT 21.12.2012

SAMPLE WAS SUBMITTED BY THE PARTY

CUSTOMER NAME : M/s STEEL AUTHORITY OF INDIA LIMITED,

ADDRESS : (VISVESVARAYA IRON & STEEL LTD)
BHADRAVATHI

SAMPLE : DUMP SAMPLE

MARK : LETTER REF. NO. BGD/ICS / TENDER – IBM/MF / 2012 – 13 DT. 19.12.12
DUMP SAMPLES FROM BHANDGUDDA LIMESTONE MINES
SAMPLE NO. SAIL / BGD / DP / SAMPLE NO. 3

TESTED AS PER .... I. S. 1760

PARAMETER	RESULTS
SILICA (SiO2)	18.35 %
ALUMINA (Al2O3)	12.75 %
IRON (Fe)	17.89 %

FOR ESSEN & CO.

M.K. VASUKI
AUTHORISED SIGNATORY

KANTHARAJ K.
RQP/GOA/130/2008/A

K.T.RAMACHANDRA
RQP/ENG/040/88/A

Essen & Co.

EC/QCF/17

ESTD 1944

ANALYTICAL CHEMISTS & ASSAYERS
(An ISO 9001 - 2008 Certified Company)
Founded by : Dr. N. JAYARAMAN, M.A., D.Sc.
Director : Dr. J. RAJARAM

CERT NO: AN/7524
REGD NO: 9091

DATE OF ISSUE : 31.12.2012
DATE OF RECEIPT: 21.12.2012

SAMPLE WAS SUBMITTED BY THE PARTY

CUSTOMER NAME: M/s. STEEL AUTHORITY OF INDIA LIMITED,
ADDRESS : (VISVESVARAYA IRON & STEEL LTD)
BHADRAVATHI

SAMPLE : LIMESTONE
MARK : LETTER REF.NO. BGD 103/TENDER-43M MP/2012 13 DT. 19.12.12
LIMESTONE FROM BHANDEGUDDA LIMESTONE MINES
SAMPLE NO. SAIL/BGD/LST/SAMPLE NO.1.

TESTED AS PER I.S.1760

PARAMETERS	PROTOCAL	RESULTS
SILICA (SiO2)	PART-2-1991 REAFFIRMED 2001	7.03 %
CALCIUM OXIDE (CaO)	PART -3-1992 REAFFIRMED 2001	45.42 %
MAGNESIUM OXIDE (MgO)	PART 3-1992 REAFFIRMED 2001	6.14 %

FOR ESSEN & CO.

AUTHORISED SIGNATORY

M.K. VASUKI

Essen & Co.

EC/QCF/17

ESTD. 1944

ANALYTICAL CHEMISTS & ASSAYERS
(An ISO 9001 - 2008 Certified Company)
Founded by : Dr. N. JAYARAMAN, M.A., D.Sc.
Director : Dr. J. RAJARAM

NO: AN/7525
NO. 9092

DATE OF ISSUE : 31.12.2012
DATE OF RECEIPT: 21.12.2012

SAMPLE WAS SUBMITTED BY THE PARTY

MER NAME: M/s. STEEL AUTHORITY OF INDIA LIMITED,
ESS : (VISVESVARAYA IRON & STEEL LTD)
BHADRAVATHI

LE : LIMESTONE
: LETTER REF.NO BGD 103/TENDER-IRM MP/2012 13 DT. 19.12.12
LIMESTONE FROM BHANDEGUDDA LIMESTONE MINES
SAMPLE NO. SAIL/BGD/LST/SAMPLE NO.2.

TESTED AS PER I.S. 1760

PARAMETERS	PROTOCAL	RESULTS
SILICA (SiO2)	PART-2-1991 REAFFIRMED 2001	6.87 %
CALCIUM OXIDE (CaO)	PART -3-1992 REAFFIRMED 2001	45.58 %
MAGNESIUM OXIDE (MgO)	PART 3-1992 REAFFIRMED 2001	5.84 %

FOR ESSEN & CO.

AUTHORISED SIGNATORY

M.K. VASUKI

ANNEXURE NO. 9

Monitoring report of

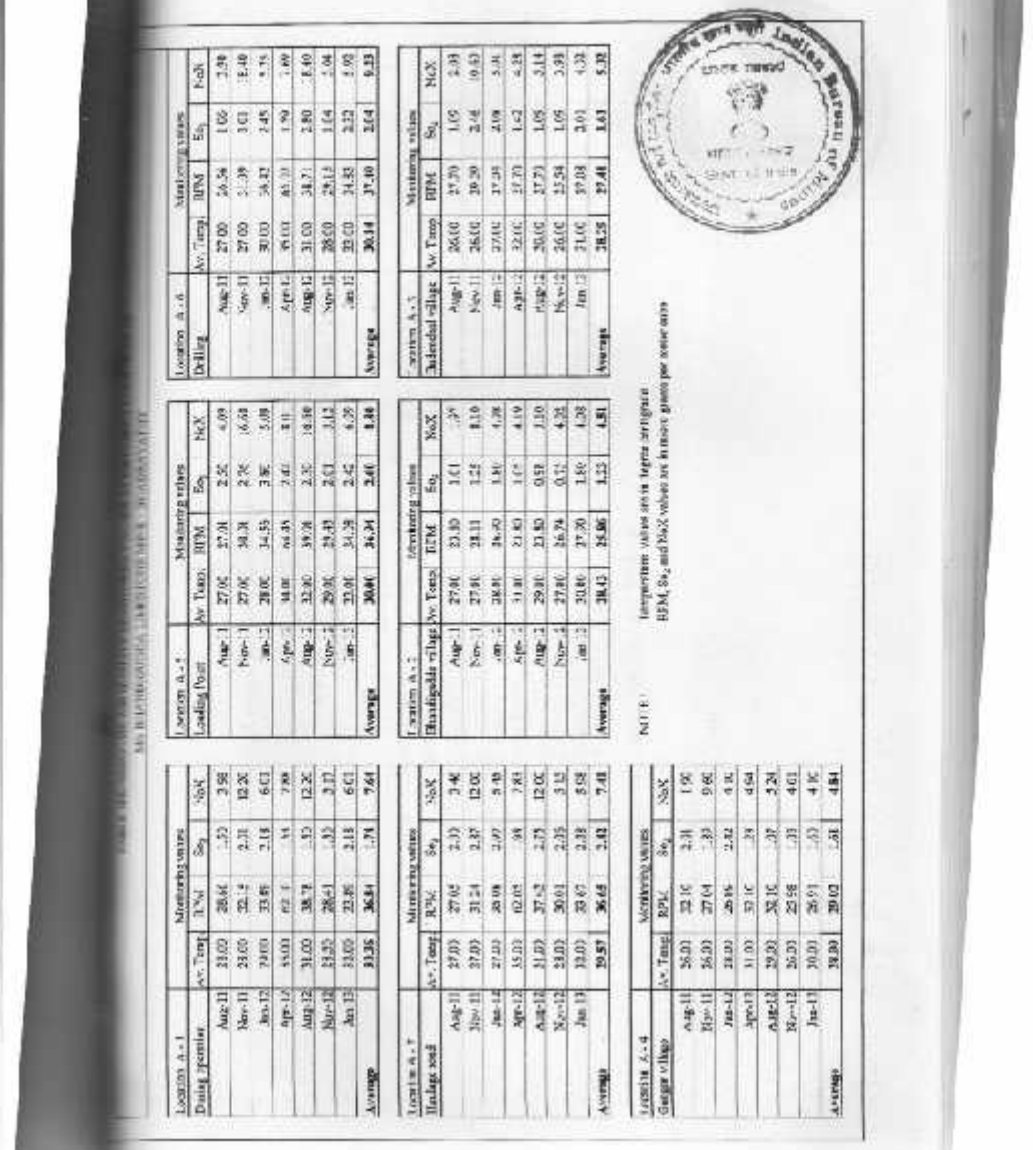
Bhandigudda Limestone Mine

of

M/s. SAIL – VISL Bhadravathy.

KANTHARAJ K.
RQP/KOR/133/2003/A

K.T.RAMACHANDRA
RQP/BNG/040/06/A



Location A-1
Dump premise

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	33.00	28.64	1.52	3.98
Nov-11	23.00	32.14	2.31	12.26
Jan-12	24.00	33.86	2.18	6.61
Apr-12	35.00	42.14	1.54	7.89
Aug-12	31.00	38.78	1.52	12.26
Nov-12	23.00	28.61	1.52	3.77
Jan-13	33.00	33.86	2.18	6.61
Average		33.86	1.91	7.64

Location A-7
Haulage road

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	27.00	27.05	2.13	3.46
Nov-11	27.00	31.24	2.87	12.00
Jan-12	27.00	28.09	2.07	5.49
Apr-12	35.00	42.05	1.94	7.81
Aug-12	31.00	37.42	2.73	12.05
Nov-12	23.00	30.01	2.25	3.32
Jan-13	33.00	33.87	2.18	6.58
Average	29.57	36.68	2.13	7.48

Location A-4
Gangavillage

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	26.00	32.16	2.31	1.95
Nov-11	26.00	27.04	2.33	9.60
Jan-12	24.00	26.96	2.32	4.31
Apr-12	31.00	37.10	2.4	4.64
Aug-12	29.00	38.16	2.37	5.24
Nov-12	26.00	28.98	2.33	4.01
Jan-13	30.00	26.93	2.32	4.16
Average	28.00	29.02	2.34	4.84

Location A-6
Loading Point

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	27.00	27.01	2.25	4.09
Nov-11	27.00	34.31	2.28	16.68
Jan-12	28.00	34.55	2.36	5.08
Apr-12	34.00	40.45	2.41	8.11
Aug-12	32.00	39.08	2.35	16.98
Nov-12	29.00	28.43	2.61	3.12
Jan-13	33.00	34.39	2.45	6.35
Average	30.00	34.04	2.40	8.06

Location A-5
Bhandigudda village

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	27.00	33.80	1.61	3.9
Nov-11	27.00	38.11	1.24	8.10
Jan-12	28.00	36.90	1.80	4.08
Apr-12	34.00	41.80	1.64	4.19
Aug-12	29.00	23.80	0.93	3.10
Nov-12	27.00	36.74	0.52	4.20
Jan-13	30.00	37.00	1.80	4.08
Average	28.43	35.86	1.22	4.81

Location A-3
Bhandigudda village

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	26.00	27.70	1.05	2.93
Nov-11	26.00	29.59	2.48	10.63
Jan-12	27.00	27.20	2.09	5.01
Apr-12	32.00	37.73	1.62	4.28
Aug-12	30.00	37.73	1.05	3.14
Nov-12	26.00	23.54	1.05	3.93
Jan-13	31.00	37.08	2.01	4.32
Average	28.28	27.41	1.61	5.32

Location A-2
Dolomite mines

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	27.00	26.54	1.05	2.98
Nov-11	27.00	31.39	3.01	12.40
Jan-12	30.00	34.32	2.45	6.15
Apr-12	35.00	40.20	1.79	7.69
Aug-12	31.00	38.71	2.80	12.60
Nov-12	28.00	29.13	1.64	3.04
Jan-13	33.00	34.83	2.32	6.92
Average	30.14	37.40	2.64	9.33

Location A-1
Bhandigudda village

Month	Monitoring values			
	Av. Temp.	RPM	So_2	NoX
Aug-11	26.00	27.70	1.05	2.93
Nov-11	26.00	29.59	2.48	10.63
Jan-12	27.00	27.20	2.09	5.01
Apr-12	32.00	37.73	1.62	4.28
Aug-12	30.00	37.73	1.05	3.14
Nov-12	26.00	23.54	1.05	3.93
Jan-13	31.00	37.08	2.01	4.32
Average	28.28	27.41	1.61	5.32

NOTE :

Temperature values are in degree centigrade
RPM, So_2 and NoX values are in micro grams per cubic metre

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 12/08/2011

Code	Area	AIR DATA			
	Buffer Zone	Avg Temp. °C	RPM (µg/nm3)	So_2 (µg/nm3)	NOX (µg/nm3)
A-2	Hadsund Village	27	29.80	1.03	5.97
A-3	Badanehal Village	26	27.70	2.09	12.06
A-4	Gangur	26	32.10	2.01	11.90
	Core Zone				
A-1	Core Zone- During Operation	28	28.60	2.30	13.90
A-5	Loading Point	27	27.01	2.05	14.05
A-6	Drilling Point	27	26.56	2.06	13.00
A-7	Haulage road	27	27.05	2.20	13.46

Norms (µg/nm³) – RPM : 100 So_2 : 80 , NOX : 80

CC:
ACM Mines & PM

Dy. Manager (EMD)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 21/11/2011

Code	Area				
	Buffer Zone	Avg Temp. °C	RPM (µg/nm3)	So_2 (µg/nm3)	NOX (µg/nm3)
A-2	Badcund Village	27	28.11	1.25	6.1
A-3	Badanehal Village	26	29.03	2.46	12.6
A-4	Gangur	26	27.04	1.89	9.8
	Core Zone				
A-1	Core Zone: During Operation	28	32.13	2.91	13.9
A-5	Loading Point	27	30.01	2.76	15.60
A-6	Drilling Point	27	31.09	3.01	16.40
A-7	Haulage Road	27	31.24	2.97	12.00

Norms (µg/nm³) – RPM : 100, So_2 : 80 , NOX : 80

CC:
DGM-Mines & PM

Y. R. Patel
Dy. Manager (EMD)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 16/01/2012

Code	Area				
	Buffer Zone	Avg Temp °C	RPM (µg/m3)	SO_2 µg/nm3)	NOX (µg/nm3)
A-2	Badigund Village	28.00	26.90	1.60	4.98
A-3	Dadeneha Village	27.00	27.04	2.06	5.21
A-4	Gangur	25.00	26.85	2.42	4.10
	Core Zone				
A-1	Core Zone- During Operation	29.00	35.85	2.18	6.31
A-5	Loading Point	28.00	34.20	3.60	5.26
A-6	Drilling Point	30.00	36.42	2.45	5.85
A-7	Haulage Road	27.00	39.08	3.67	5.19

Norms (µg/m³) – RPM : 100, SO_2 : 80 , NOX : 80

16/1/12

CC:
DGM-Mines & RM

Dy. Manager (ED)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 12/04/2012

Code	Area				
	Buffer Zone	Avg Temp °C	RPM (µg/m3)	SO_2 µg/nm3)	NOX µg/nm3)
A-2	Badigund Village	31	23.8	1.25	4.15
A-3	Baccneha Village	32	27.7	1.42	4.28
A-4	Gangur	31	32.1	1.23	4.54
	Core Zone				
A-1	Core Zone- During Operation	36	52.1	1.52	7.88
A-5	Loading Port	34	64.45	2.42	8.01
A-6	Drilling Port	35	65.02	1.59	7.65
A-7	Haulage Road	35	62.05	1.98	7.83

Norms (µg/m³) – RPM : 100, SO_2 : 80 , NOX : 80

12/4/12

(B S Venkatesh)
AGM (ED & ENV.)

CC:
DGM-Mines & RM

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 16/05/2012

Code	Area **Buffer Zone**	Avg Temp.°C	RPM (µg/nm3)	SO_2 (µg/nm3)	NOx (µg/nm3)
A-2	Badigund Village	29	29.8	0.95	5.1
A-3	Badanehal Village	30	27.7	1.08	5.14
A-4	Gangur	29	32.1	1.07	5.24
	Core Zone				
A-1	Core Zone- During Operation	31	35.78	1.5	7.2
A-5	Loading Point	32	39.0	2.3	10.60
A-6	Drilling Point	31	38.71	2.8	16.40
A-7	Haulage Road	31	37.45	2.75	12.00

Norms (µg/nm³) – RPM : 100, SO_2 : 80 , NOX : 80

(D.S Venkatesan)
AGM (ED & ENV.)

CC:
DGM-Mines & RM

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 27/.../2012

Code	Area **Buffer Zone**	Avg Temp.°C	RPM (µg/nm3)	SO_2 (µg/nm3)	NOX (µg/nm3)
A-2	Badigund Village	27	26.74	0.75	4.02
A-3	Badanehal Village	26	25.54	1.09	3.98
A-4	Gangur	26	25.98	1.05	4.01
	Core Zone				
A-1	Core Zone- During Operation	28.5	28.41	1.5	5.17
A-5	Loading Point	29	29.45	2.01	5.12
A-6	Drilling Point	26	28.15	1.94	5.04
A-7	Haulage Road	28	30.01	2.05	5.15

Norms (µg/nm³) – RPM : 100, SO_2 : 80 , NOX : 80

(D.S Venkatesan)
AGM (ED & ENV.)

CC:
DGM-Mines & RM

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 15/01/2013

Code	Area	Avg amc %	RPM (µg/m3)	SO_2 µg/m3	NOX (µg/m3)
	Buffer Zone				
A-2	Belagurki Village	30	27.4	1.8	4.09
A-3	Bananahal Village	31	27.09	2.01	4.02
A-4	Gangur	30	26.91	1.9	4.1
	Core Zone				
A-1	Core Zone- During Operation	32	33.89	2.18	6.01
A-5	Loading Point	33	34.08	2.42	6.09
A-6	Drilling Point	33	34.93	2.32	5.92
A-7	Haulage Road	32	33.67	2.26	5.95

Norms (µg/m³) – RPM : 100, SO_2 : 80 , NOX : 80

(B.S venkatesh)
DGM (ISO & ENV.)

CC:
DGM-Mines & RM

MONITORING OF AMBIENT AIR QUALITY AND METEOROLOGICAL DATA
M/S BHADRAVATHI ISPAT (P) LIMITED, BHADRAVATHI

Location : N S - 4	Monitoring values		
During operation	L max	L Min	L eq
Aug-11	62.00	52.00	50.00
Nov-11	64.00	52.00	51.00
Jan-12	65.00	53.00	52.00
Apr-12	64.00	53.00	52.00
Aug-12	64.00	54.00	53.00
Nov-12	65.00	54.00	52.00
Jan-13	65.00	55.00	52.00
Average	64.29	53.57	51.86

Location : N S - 5	Monitoring values		
Loading Point	L max	L Min	L eq
Aug-11	86.00	80.00	85.00
Nov-11	87.00	81.00	86.00
Jan-12	84.00	82.00	85.00
Apr-12	87.00	80.00	83.00
Aug-12	85.00	82.00	84.00
Nov-12	84.00	82.00	85.00
Jan-13	84.00	82.00	83.00
Average	85.29	81.71	84.14

Location : N S - 6	Monitoring values		
Haulage Road	L max	L Min	L eq
Aug-11	76.00	68.00	73.00
Nov-11	80.00	71.00	74.00
Jan-12	80.00	70.00	74.00
Apr-12	78.50	70.00	74.00
Aug-12	81.00	71.00	75.00
Nov-12	80.00	70.00	75.00
Jan-13	80.00	68.00	74.00
Average	79.79	69.79	74.57

Location N S - 7	Monitoring values		
Drilling point	L max	L Min	L eq
Aug-11	87.00	82.00	88.00
Nov-11	88.00	82.00	85.00
Jan-12	88.00	80.50	85.50
Apr-12	88.50	82.50	84.00
Aug-12	87.00	80.00	82.00
Nov-12	88.00	80.50	85.50
Jan-13	88.00	80.50	85.50
Average	87.79	81.64	84.24

Location : N S -	Monitoring values		
Hirandgudda village	L max	L Min	L eq
Aug-11	58.00	53.00	49.00
Nov-11	57.50	54.00	46.00
Jan-12	55.00	50.00	45.00
Apr-12	57.50	54.00	50.00
Aug-12	55.00	52.00	43.00
Nov-12	55.00	50.00	45.00
Jan-13	55.00	50.00	45.00
Average	56.57	51.86	44.14

Location : N S - 2	Monitoring values		
Bananahal Village	L max	L Min	L eq
Aug-11	56.00	48.00	47.00
Nov-11	55.00	48.00	48.00
Jan-12	54.00	47.00	48.00
Apr-12	55.00	48.50	48.00
Aug-12	54.00	48.00	45.00
Nov-12	54.00	47.00	45.00
Jan-13	54.00	47.00	47.00
Average	54.86	48.07	47.57

Location : N S - 3	Monitoring values		
Transport to Jaga	L max	L Min	L eq
Aug-11	60.00	50.00	48.00
Nov-11	61.00	48.00	49.00
Jan-12	62.00	52.00	48.50
Apr-12	61.00	51.00	50.00
Aug-12	63.00	53.00	48.50
Nov-12	62.00	52.00	48.50
Jan-13	62.00	52.00	48.50
Average	61.86	51.14	47.14

NOTE : All values are in decibels (dB)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 12/05/2011

Code	Area	Noise Level Day			Remarks
		Leq	L10	L90	
	Buffer Zone				
NS-1	Badigund Village	58	53	49	
NS-2	Kadanekal Village	56	49	47	
NS-3	Gangur	60	50	48	
	Core Zone				
NS-4	Core Zone- During Operation	63	58	53	
NS-5	Loading Point	76	60	63	
NS-6	Haulage Road	79	69	73	
NS-7	Drilling Point	67	62.5	65.5	

Note : Unit Decibels dB(A)
NS: Noise Monitoring Stations

CC:
DGM-Mines & RM

Dy. Manager (ENV)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 21/12/2011

Code	Area	Noise Level Day			Remarks
		Leq	L10	L90	
	Buffer Zone				
NS-1	Badigund Village	52.5	54	48	
NS-2	Kadanekal Village	55	58	46	
NS-3	Gangur	63	49	46	
	Core Zone				
NS-4	Core Zone- During Operation	64	53	51	
NS-5	Loading Point	67	61	56	
NS-6	Haulage Road	80	73	73	
NS-7	Drilling Point	69	63	65	

Note : Unit Decibels dB(A)
NS: Noise Monitoring Stations

CC:
DGM-Mines & RM

Dy. Manager (ENV)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 26/04/12

Code	Area	Noise Level Data			Remarks
	Buffer Zone	1048	1006	548	
NS-1	Badigund Village	56	50	55	
NS-2	Bahanekal Village	54	47	49	
NS-3	Gangur	47	42	46.5	
	Core Zone				
NS-4	Core Zone- Dumping Operation	65	55	62	
NS-5	Loading Point	64	62	65	
NS-6	Haulage Road	68	70	72	
NS-7	Drilling Point	88	90.5	85.5	

Note : Unit: Decibel dB(A)
NS: Noise Monitoring Station

CC
GCM-Mines & RM

Dy. Manager (Env.)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 12/04/2012

Code	Area	Noise Level Data			Remarks
	Buffer Zone	Leq	Lmin	Lmax	
NS-1	Badigund Village	57.5	54	58	
NS-2	Bahanekal Village	50.4	47.5	46	
NS-3	Gangur	44.5	42.1	50	
	Core Zone				
NS-4	Core Zone- Dumping Operation	64	53.2	52.5	
NS-5	Loading Point	67	60.1	65	
NS-6	Haulage Road	70.5	68	72	
NS-7	Drilling Point	88.5	82.5	84.6	

Note : Unit: Decibel dB(A)
NS: Noise Monitoring Stations

CC
GCM-Mines & RM

(B.V.Venkatesh)
AGM (Env.)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 3/12/2012

Code	Area	Noise Level Data			Remarks
		Day	Night	Leq	
	Buffer zone				
NS-1	Badigund Village	55	52	45	
NS-2	Badarachat Village	51	44	43	
NS-3	Gangur	63	55	46.5	
	Core Zone				
NS-4	Core Zone- During Operation	58	58	58	
NS-5	Leading Point	55	52	53	
NS-6	Haulage Road	55	52	53	
NS-7	Drilling Point	57	53	52	

Note: Unit: Decibels (dB(A)
NS: Noise Monitoring stations

CC
DGM-Mines & RM

(B S Venkatesh)
AGM (EC & EM)

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI
ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 17/11/2012

Code	Area	Noise Level Data			Remarks
	Buffer zone	Day	Night	Leq	
NS-1	Badigund Village	56	50	49	
NS-2	Badarachat Village	54	47	45	
NS-3	Gangur	62	55	56.5	
	Core Zone				
NS-4	Core Zone- During Operation	65	55	57	
NS-5	Leading Point	63	62	63	
NS-6	Haulage Road	60	70	70	
NS-7	Drilling Point	61	63	62.5	

Note: Unit: Decibels (dB(A)
NS: Noise Monitoring Stations

CC
DGM-Mines & RM

(B S Venkatesh)
AGM (EC & EM)

STEEL AUTHORITY OF INDIA LIMITED

VISVESVARAYA IRON & STEEL PLANT, BHADRAVATI

ENVIRONMENT MANAGEMENT DEPARTMENT

Date: 20/07/2013

Code	Area	Monitoring Period			
	Date & Time	Time	Date	Year	Remarks
NS-1	Mattagunni Village	56	50	15	
NS-2	Badarcha Village	54	47	15	
NS-3	Ganguru	60	53	16.5	
	Core Zone				
NS-4	Core Zone During Operation	65	55	52	
NS-5	Loading Point	58	47	53	
NS-6	Haulage Road	80	70	75	
NS-7	Dozing Point	60	80.5	45.5	

Note : Unit : DC in KG/HR/SQ.M

NS Name Monitoring Agency

(B S Venkatesh)
DGM (ED & EMD)

JCM (Coal & RM)

TABLE SHOWING THE WATER QUALITY MONITORED VALUES AT DIFFERENT LOCATIONS OF

Location	Monitoring values						
Ghat @ area	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	27.80	7.30	320.0X	205.60	11.75	147.00	19.30
Nov-11	27.80	7.10	400.0X	301.80	10.22	164.00	21.30
Jan-12	27.80	7.20	360.0X	202.60	7.70	165.00	22.30
Apr-12	28.60	7.20	410.0X	212.60	8.02	162.00	24.30
Aug-12	28.60	7.10	390.0X	212.60	10.10	161.00	18.30
Nov-12	28.60	7.00	380.0X	98.60	11.01	158.00	22.30
Jan-13	28.60	7.40	402.0X	212.60	7.52	172.00	24.30
Average	27.71	7.28	383.0X	180.60	9.40	159.57	20.86

Location	Monitoring values						
Chinnamadde	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	28.30	7.30	480.0	190.X	14.80	170.00	30.00
Nov-11	27.80	7.10	400.0	180.X	9.80	180.00	28.00
Jan-12	28.30	7.20	460.0	220.X	8.80	170.00	22.00
Apr-12	28.30	7.20	480.0	200.X	9.80	180.00	20.00
Aug-12	27.30	7.10	480.0	200.X	10.80	178.00	30.00
Nov-12	27.30	7.10	490.0	170.X	9.80	165.00	20.00
Jan-13	27.30	7.10	420.0	200.X	8.20	180.00	20.00
Average	27.14	7.16	451.43	193.57	9.28	153.57	28.00

Location	Monitoring values						
Bhadrapura	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	30.00	7.50	480.X	190.X	9.40	170.00	30.00
Nov-11	25.00	7.30	520.X	210.00	10.22	172.00	32.00
Jan-12	25.00	7.30	420.X	210.00	8.20	180.00	32.00
Apr-12	25.00	7.40	420.X	220.00	8.20	190.00	28.00
Aug-12	27.00	7.20	460.X	210.00	8.80	168.00	30.00
Nov-12	27.00	7.20	460.X	190.00	10.80	170.00	30.00
Jan-13	27.00	7.10	420.X	190.00	8.22	180.00	30.00
Average	25.00	7.33	422.42	181.14	9.33	142.86	30.29

Location	Monitoring values						
Dubrai village	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	28.00	7.30	360.00	180.00	10.20	130.00	30.00
Nov-11	27.00	7.30	370.00	180.00	10.00	140.00	30.00
Jan-12	27.00	7.20	390.00	180.00	8.30	130.00	30.00
Apr-12	28.00	7.00	390.00	190.00	8.30	140.00	28.00
Aug-12	28.00	7.30	360.00	180.00	10.20	130.00	30.00
Nov-12	28.30	7.20	420.00	190.00	8.00	150.00	30.00
Jan-13	28.30	7.30	370.00	170.00	8.00	130.00	30.00
Average	27.71	7.23	351.14	177.00	9.30	133.57	29.71

Location	Monitoring values						
Gangru village	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	27.30	7.40	400.00	220.00	10.10	170.00	32.00
Nov-11	28.30	7.50	390.00	210.00	11.10	180.00	30.00
Jan-12	28.30	7.30	420.00	210.00	9.80	180.00	30.00
Apr-12	28.00	7.40	420.00	210.00	9.80	180.00	28.00
Aug-12	27.30	7.40	410.00	210.00	10.10	180.00	30.00
Nov-12	28.00	7.30	440.00	240.00	10.10	190.00	32.00
Jan-13	27.30	7.30	400.00	210.00	8.10	180.00	30.00
Average	27.87	7.36	385.00	213.33	9.14	186.71	29.86

Location	Monitoring values						
Yerrandoddi	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	28.80	7.30	410.00	240.00	9.80	170.00	32.00
Nov-11	28.80	7.50	420.00	180.00	9.80	170.00	30.00
Jan-12	28.80	7.30	410.00	200.00	8.80	180.00	32.00
Apr-12	28.80	7.40	400.00	190.00	9.80	190.00	28.00
Aug-12	27.80	7.30	410.00	220.00	10.80	170.00	30.00
Nov-12	27.80	7.30	410.00	180.00	10.80	170.00	30.00
Jan-13	28.80	7.20	400.00	170.00	8.80	180.00	32.00
Average	28.14	7.37	417.86	197.14	9.90	169.00	30.57

Location	Monitoring values						
Doddal village	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	27.30	7.60	410.00	195.30	9.30	155.00	30.00
Nov-11	27.30	7.40	415.00	175.30	9.80	160.00	30.00
Jan-12	28.30	7.30	410.00	175.30	8.80	150.00	30.00
Apr-12	28.30	7.30	480.00	225.30	8.40	165.00	28.00
Aug-12	27.30	7.40	410.00	190.30	9.40	170.00	30.00
Nov-12	27.30	7.50	430.00	190.30	9.60	165.00	30.00
Jan-13	28.30	7.30	415.00	200.30	8.00	160.00	30.00
Average	27.71	7.47	415.57	190.30	9.09	160.57	30.00

Location	Monitoring values						
Bidigere village	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	27.80	7.10	410.00	210.00	9.40	160.00	28.00
Nov-11	27.00	7.10	390.00	190.00	11.10	160.00	30.00
Jan-12	27.80	7.10	400.00	200.00	8.80	170.00	28.00
Apr-12	28.00	7.10	410.00	220.00	8.80	170.00	28.00
Aug-12	28.00	7.20	410.00	210.00	9.40	170.00	30.00
Nov-12	28.00	7.30	390.00	190.00	10.80	160.00	30.00
Jan-13	28.00	7.30	400.00	210.00	8.80	160.00	30.00
Average	27.67	7.15	401.14	210.00	8.14	160.00	28.00

Location	Monitoring values						
Halasur village	Av. Temp	pH	TDS	Hardness	DC	Alkalinity	Chloride
Aug-11	28.80	7.40	410.00	190.00	8.80	160.00	30.00
Nov-11	28.80	7.50	420.00	180.00	10.80	170.00	30.00
Jan-12	28.80	7.30	420.00	190.00	8.40	180.00	30.00
Apr-12	28.80	7.30	410.00	200.00	8.40	180.00	28.00
Aug-12	28.80	7.30	410.00	200.00	8.80	180.00	30.00
Nov-12	28.80	7.20	410.00	180.00	10.80	170.00	30.00
Jan-13	27.80	7.20	390.00	200.00	8.80	170.00	30.00
Average	27.86	7.30	410.00	190.00	8.80	170.00	30.00

Note: All values are in mg/l or Degree C in pH

GM/DUS40/2011-12

Date 22-08-2011

Sub: Analysis Report of B.G.D. Mines & surrounding villages
Ref: Requisition from Dy.Manager- Mines dated:16-08-2011

Sl.No	Type of water	NORM as per IS 10500:1991									
		5	-	-	6.5-8.5	-	500	300	-	200	250
		Colour	Odour	Temperature	pH	TSS	TDS	Total Hardness	DO	T.Alkalinity	Chlorides
1	Mine pit water	CL	Nao	27	7.30	80	370	205	10.20	160	16
2	Mines canteen water	CL	Nao	26	7.20	84	410	190	10.00	170	10
3	Bhadigund village	CL	Nao	28	7.50	88	380	200	9.40	170	12
4	Bedenahal village	CL	Nao	28	7.10	80	350	195	10.12	165	10
5	Gangavi village	CL	Nao	27	7.40	88	400	220	10.10	175	11
6	Yammedoddi village	CL	Nao	28	7.10	81	410	240	9.80	170	11
7	Dodderi village	CL	Nao	27	7.60	73	410	205	9.10	165	10
8	Belagere village	CL	Nao	27	7.50	85	435	230	9.40	160	13
9	Balakata village	CL	Nao	28	7.20	84	420	240	8.90	165	13

Note: 1. NOO : No Occur Observed, OO: Odour Observed
BDL : Below Detectable Level, CL: Colourless, SBC: Slight Brown Colour
2. All Parameters are in mg/L except pH & Temperature

Dy. Manager (Mines)
CC: OIC

Head of Section
Central Laboratory
M.O. Malyanara

VISVESVARAYA
RQP/BNG/040/98/A

K.S. KANTHARAJ K
RQP/GOA/159/2008/A

Indian Bureau of Mines

Indian Bureau of Mines

STEEL AUTHORITY OF INDIA LIMITED
Visvesvaraya Iron & Steel Plant

Date 22.08.2011

QA/CL/652/2011-12

Sub: Analysis report of B.G.D. Mines & surrounding villages.
Ref: Requisition from Dy.Manager- Mines Dated:17-01-2012

Sl.No	Type of water	NORM as per IS 10500:1991									
		5 Colour	- Odour	- Temperature	6.5-8.5 pH	- TSS	500 TDS	300 Total Hardness	- DO	200 T.Alkalanity	250 Chlorides
1	Mine pit water	CL	Non	27	7.50	60	380	200	0.70	165	22
2	Mines canteen water	CL	Non	29	7.20	64	410	220	8.50	170	23
3	Bhadigund village	CL	Non	25	7.60	60	435	210	8.20	180	19
4	Badenahal village	CL	Non	27	7.20	60	390	210	8.50	190	8
5	Gangur village	CL	Non	28	7.50	70	475	250	7.00	175	19
6	Yammaccoil village	CL	Non	29	7.10	68	410	205	9.00	185	12
7	Dodderi village	CL	Non	28	7.50	72	440	220	8.10	180	14
8	Belegeri village	CL	Non	27	7.20	70	400	200	8.60	170	12
9	Balakatta village	CL	Non	29	7.50	60	420	240	8.40	195	14

Note: 1. NOO : No Odour Observed, OO :Odour Observed
BDL : Below Detectable Level CL: Colourless, SBC: Slight Brown Colour
2. All Parameters are in mg/l, except pH & Temperature

Dy. Manager (Mines)
CC: O/C

Head of Section
Chemical Laboratory

STEEL AUTHORITY OF INDIA LIMITED
Visvesvaraya Iron & Steel Plant

QA/CL/04/2012-13

Date:10-04-2012

Sub: Analysis Report of B.G.D. Mines & surrounding villages.
Ref: Requisition from Dy.Manager- Mines dated:12-04-2012

Sl.No	Type of water	NORM as per IS 10500:1991									
		5 Colour	- Odour	- Temperature	6.5-8.5 pH	- TSS	500 TDS	300 Total Hardness	- DO	200 T.Alkalanity	250 Chlorides
1	Mine pit water	CL	Non	28	7.30	65	410	210	8.00	180	24
2	Mines canteen water	CL	Non	29	7.60	75	420	200	8.20	185	25
3	Bhadigund village	CL	Non	28	7.40	60	450	220	8.20	180	26
4	Badenahal village	CL	Non	28	7.60	65	380	210	8.30	190	21
5	Gangur village	CL	Non	28	7.40	75	420	230	8.90	185	20
6	Yammaccoil village	CL	Non	29	7.40	80	450	205	9.00	190	28
7	Dodderi village	CL	Non	28	7.50	65	450	225	8.40	185	20
8	Belegeri village	CL	Non	28	7.30	85	410	220	8.20	175	28
9	Balakatta village	CL	Non	29	7.50	70	440	235	8.40	190	27

Note: 1. NOO : No Odour Observed, OO :Odour Observed
BDL : Below Detectable Level, CL: Colourless, SBC: Slight brown Colour
2. All Parameters are in mg/l, except pH & Temperature

Dy. Manager (Mines)
CC: O/C

Head of Section
Chemical Laboratory

STEEL AUTHORITY OF INDIA LIMITED
Visvesvaraya Iron & Steel Plant

CA/CL009/2012-13 Date:16.11.2012

Sub: Analysis Report of B.G.C. Mines & surrounding villages
Ref: Requisition from Dy.Manager- Mines dated:09.11.2012

Sl.No	Type of water	NORM as per IS 10500:1991									
		5	-	-	6.5-8.5	-	500	300	-	200	250
		Colour	Odour	Temperature	pH	TSS	TDS	Total Hardness	DO	T Alkalinity	Chlorides
1	Vitrified water	CL	Noo	28	7.00	60	365	185	10.00	140	32
2	Mines Division water	CL	Noo	27	7.10	60	400	175	9.80	145	40
3	Sirsinahalli village	CL	Noo	29	7.20	58	390	170	12.10	132	30
4	Jadigal Steel Plant	CL	Noo	28	7.00	64	420	176	9.85	138	14
5	Jadigal railway	CL	Noo	28	7.50	70	440	365	10.20	140	12
6	Hanjarakundi village	CL	Noo	27	7.10	72	425	160	12.50	130	14
7	Jodesar village	CL	Noo	27	7.20	70	400	160	9.85	145	14
8	Bhadravathi village	CL	Noo	28	7.20	72	390	390	10.00	145	16
9	Kadadi village	CL	Noo	28	7.30	80	410	160	10.40	132	12

Note : NOO : No Odour Observed, OO: Odour Observed
BDL : Below Detectable Level CL: Colourless, SRC: Slight Aroun Odour
All Parameters are in mg/L except pH & Temperature

Dy. Manager (Mines)
CC: DM

Head of Section
Chemical Laboratory

ANNEXURE NO 10

Form 7

TN63Z2007/0031778
MAHALINGAM K
KALIMUTHAN

2-12 K.NO.3-28, PADAIYACHIYENDAL
IYUR, TIRUVALLANGADU TK

M DRIVING SCHOOL
23/04/1962

07/09/2007

KANTHARAJ K.
ROP/TVL/OOA/130/2003/A

K.T.RAMACHANDRA
ROP/BNG/040/88/A

STEEL AUTHORITY OF INDIA LIMITED
VISVESVARAYA Iron & Steel Plant

Date: 02/03/2012

Sub: Analysis Report of D.G.P. Wells & surrounding villages
Ref: Lr.No.SAIL/VISL/Dy.Manager-Mines dated:1st-Mar-2012

Sl.No.	Type of water	Colour	Odour	Temperature	pH value	PH/DRM as per IS : 0500 :1991 TDS	TCH	Total Hardness	CH	Alkalinity	Chlorides
		Hazen				2000	600	300	200	200	250
1	Mine sump water	Cl.	Nac	28	7.40	82	402	211	116	112	26
2	Mines rainwater water	Cl.	Nac	27	7.05	95	430	222	130	102	22
3	Bandigaru village	Cl.	Nac	29	7.70	90	442	233	140	100	8
4	Sadanahalli village	Cl.	Nac	23	7.80	91	378	223	140	175	11
5	Ramjan village	Cl.	Nac	27	7.80	84	406	232	132	100	9
6	Yammadoddi village	Cl.	Nac	20	7.95	86	460	276	162	160	16
7	Dasthavalam village	Cl.	Nac	29	7.10	98	476	285	180	96	11
8	Belagere village	Cl.	Nac	23	7.05	98	466	273	110	100	13
9	Rudakote village	Cl.	Nac	27	7.30	94	460	253	130	150	14

Note: 1.NOT : No Odour Objectionable; OC: Odour Objectionable
BDL : Below Detectable Level; Cl : Colourless; Nac : Not Objectionable
2. All Parameters are in mg/L except pH & Temperature

DY. Manager (Mines)
CC: OIC

Bureau of Mines

ANNEXURE NO. 1)

CERTIFICATE OF RECOGNITION AS ALIFIED PERSON TO PREPARE MINING PLANS

(Under Rule 22C of Mineral Concession Rules, 1960)

Shri KANTHARAJ K resident

SULLA - GOA S/O

KENTAPPA K having given satisfactory

nce of his qualifications and experience is hereby granted recognition

Rule 22C of the Mineral Concession Rules, 1960 as a Qualified

on to prepare Mining Plans

His registration number is IQP/GOA/130/2000/A

This recognition is valid for a period of two years

9.10.2002

Regional Controller of Mines
Indian Bureau of Mines
Goa Regional Office

KANTHARAJ K.
RQP/GOA/130/2000/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

5/10/2012 तक वैधीकरण किया गया

OCTOBER, 2012

क्षेत्रीय-खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines
गोवा क्षेत्र

भारतीय खान ब्यूरो
Govt. of India

वैधीकरण किया गया

क्षेत्रीय-खान नियंत्रक

भारतीय खान ब्यूरो

गोवा क्षेत्र

CERTIFICATE OF RECOGNITION AS
QUALIFIED PERSON TO PREPARE MINING PLANS

(Under Rule 22 (c) of Mineral Concession Rules 1960)

Shri K. S. RAVICHANDRA ..... resident

of CHITRADURGA DISTRICT, KARNATAKA ..... has

passed the B.E. (MINES) ..... having given satisfactory

proof of his qualifications and experience is hereby granted recognition

under Rule 22 (c) of the Mineral Concession Rules, 1960 as a Qualified

Person to prepare Mining Plans.

His registration number is KQP / MNG / 040 / 88 / A .

This recognition is valid for a period of two years

upto 03rd October 1990

Dated: BANGALORE

the 04.10.1988

Recorded upto 04.10.1988

at 9:19:54

Regional Controller of Mines
Indian Bureau of Mines
Bangalore.

(M. KRISHNAIAH)
Regional Controller of Mines
Indian Bureau of Mines
Bangalore

Regional Controller of Mines
Indian Bureau of Mines
Bangalore.

ANNEXURE NO 12

Feasibility report on

Bhandiquddo Limestone Mine

of

M/s. SAIL – VISL Bhadravathy.

KANTHARAJ K.
RQP/GOA/139/2000/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

LOCATION AND ACCESSIBILITY:

The said mine falls in the village Bhandigudda, under the survey No.81 (part) of Bhadravathi Taluk, Shimoga district of Karnataka State. This Mine lies towards east of northeast of Bhadravathi town and is at a distance of 18.0 Kms (Aerial distance). The mine is accessible by all weather roads from Bhadravathi town till the mine site. A key plan showing the lease area and its surrounding up to 10.0 kms is enclosed as **Plate No. 1** and location Map showing the lease area and its accessibility is enclosed as **Plate No. 2**. A surface plan showing the detailed survey of the said mine with contour interval of 5.0 M and all the surface features is enclosed as **Plate No. 4**.

Apart from the above survey, G P S reading of all the boundary pillars has been recorded by W G S 84 datum the latitude and longitude of the are shown in below table;

Sl. No.	B P No.	Latitude (N)	Longitude (E)
1	A	13° 53' 02.0"	75° 50' 45.5"
2	B	13° 53' 09.3"	75° 50' 47.2"
3	C	13° 53' 07.9"	75° 50' 55.3"
4	D	13° 53' 09.0"	75° 51' 06.7"
5	E	13° 53' 08.2"	75° 51' 12.3"
6	F	13° 53' 11.9"	75° 51' 13.0"
7	G	13° 53' 11.0"	75° 51' 15.5"
8	H	13° 53' 09.5"	75° 51' 15.5"
9	I	13° 53' 01.2"	75° 51' 22.0"
10	J	13° 52' 58.2"	75° 51' 2..1"
11	K	13° 52' 56.4"	75° 51' 29.5"
12	L	13° 52' 53.5"	75° 51' 30.7"
13	M	13° 52' 50.8"	75° 51' 30.5"

Apart from the establishing and fixing above boundary pillars, Three Ground Control Points (GCP) has been fixed and linked with the boundary pillars

The details of G C Ps are shown below

G C P No.	Details of G C P	Latitude (N)	Longitude (E)	R L
1	Water Tank	13° 53' 04.4"	75° 50' 43.2"	704.50
2	Mariyamma temple	13° 53' 07.7"	75° 50' 34.9"	703.10
3	Taluk boundary pillar	13° 53' 11.5"	75° 51' 33.2"	868.07

FEASIBILITY REPORT ON BHANDIGUDDA LIMESTONE MINE OF M/s. SAIL – VISL – BHADRAVATHY..

INTRODUCTION:

M/s. Steel Authority of India having their Steel Plant at Bhadravathi under the banner **Visweswaraya Iron & Steel Ltd.**, which is undertaken by Government of India. This lease was initially granted over an area of **97.12 Ha** during the year 1963. Where presently the entire area falls under Forest. Thereafter this lease has been renewed two times the first renewal was on 1983 and second was on 2003. During the second renewal **57.00 ha** of forest land was surrendered to the Government and only **40.12 ha** was retained for Mining purpose, where more or less entire area is broken. Both the renewals were for a period of Twenty years. The last renewal i.e the second renewal was renewed on 15.05.2011 and it was effected from 01.04.2003 onwards for a period of twenty years; presently this lease is valid till 31.03.2023. A copy of the lease deed is enclosed as **Annexure No. 1.** A copy of the lease sketch is enclosed as **Plate No. 3.**

Presently this lease is having a valid Scheme of Mining proposal for the year 08 -09 to 2012 - 13 and the same was approved vide your office letter No. MS / SMG / Lst – 112 – 87 dated 27.06.2008 a copy of the said approval letter is enclosed as **Annexure No. 2.** The said Scheme of Mining is valid till 31.03.2013. Similarly a Scheme of Mining needs to be prepared for the forth coming years i.e from 2013 – 14 to 2017 – 18 for a period of five years and accordingly the said ensuing scheme has been prepared and submitting for your kind approval.

This mine is being operated by mechanized means and opencast method of mining. This mine's rated capacity is to produce 1,00,000 tonnes of Limestone per annum, where there is a Environment clearance from the State Level Environment Impact Assessment Authority, Karnataka to produce 1.00 lakh tonnes of Limestone a copy of the Environment Clearance is enclosed as **Annexure No. 3.** Since the Entire area of **40.12** ha falling under forest, Forest Clearance was obtained for entire **40.12 ha.** A copy of the forest diversion obtained so is enclosed as **Annexure No. 4.**

M/s. SAIL – VISL, having three mines nearby VISL steel plant to meet their requirement. The mines are as follows

Sl. No.	Name of the Mine	M. L. No.	Extent in Ha.
1.	Bhadigund Limestone mine	2660	40.12
2.	Kanchapura Dunite Mines	2307	4.45
3.	Kemmangundi Iron ore mine	Closed as per MOEF order	

BP – A lies towards 132° 30' with respect to north from **G C P No. 1** (Water tank) at a distance of 110.00 M and similarly it lies 118° 10' with respect to north from **G C P No. 2** (Temple) at a distance of 374.00 M. Few photographs of the Mine working, boundary pillars and G C P are enclosed as **Plate No. 20, 21 & 22** respectively. All the G C P points are marked on Environment Plan and enclosed as **Plate No. 17.**

GEOLOGY AXIS : G 1 DETAILED EXPLORTION.

1. **GEOLOGICAL SURVEY:**

The entire topographical survey of the said mine has been carried out with a contour interval of 5.0 mts, where all the surface features are surveyed and plotted on 1 : 2000 scale a surface plan of the same is enclosed as **Plate No. 5.** There after a detailed surface geological mapping was also carried out on 1 : 2000 scale. All the drilled boreholes, exposed different litho units and its structural attitudes were surveyed and mapped. A geological plan showing all the geological features is enclosed as **Plate No. 6.**

Based on the available data, the strike length extends over an length of 800 mts and the width varies from 150 - 200 mts. And the depth persistence on an average is 150 mts.

Based upon the updating of the geological mapping and available exploration data, geological transverse cross section were prepared at a regular interval of 100.0 mts and a longitudinal section, where its shows the disposition of the Limestone and its associated formation. Geological Transverse cross section & Longitudinal cross section are prepared on 1 : 1000 scale is enclosed as **Plate No. 7 & 8** respectively.

2. **GEO CHEMICAL SURVEY:**

Occurrence of Limestone which was noticed and the outcrop of the same is very much visible on the surface of the lease area. Analysis of surface sample was good indicator for occurrence at depth below. In fact visual observation itself was good enough to anticipate occurrence of the deposit. The observation has been subsequently substantiated with the help of drilling boreholes. Where the exploration was carried out by Department of Mines & Geology and National Mineral Development Corporation Ltd.,

The exploration, which was carried out by DMG and by NMDC was quite than sufficient. Below table shows the details of exploration carried out.

Sl No.	Exploration agency	No of B H drilled	Cumulative meterage	Remarks
1.	Department of Mines & Geology	39	2,434.19	Core drill
2.	National Mineral Development Corporation Ltd.,	14	1,801.10	Core drill
	Total	53	4,235.29	

Totally 62 boreholes were drilled, after surrendering the area of **57.00 Ha** and retaining only **40.12 ha** for mining purpose, about 9 boreholes were gone outside the lease area. So only 53 boreholes are considered for reserves estimation and to establish the geological structure.

A list of boreholes drilled by DMG and NMDC is enclosed as **Annexure No. 6** and few typical logs of the same is enclosed as **Plate No. 8.** Since the exploration has been carried out by way of core drilling in early sixties by DMG & NMDC the analysis report of the same is not available. However the grades so available with the log descriptions are enclosed as **Annexure No. 7.** Two face samples of Limestone analyzed by N A B L laboratory is enclosed as **Annexure No. 8.**

Exploration was carried out at an regular interval, and boreholes were extended up to a maximum depth varying from 335 mts. The samples were also analyzed at regular interval varying from 1.0 - 2.0 mts in ore column and ore sample in waste horizon. The analysis so analysed and its results are furnished in the borehole log enclosed as **Plate No. 8.**

3. GEO – PHYSICAL SURVEY:

Geophysical techniques are routinely used in an exploration program to help Project Geologists to delineate areas favourable for the type of target being pursued. These techniques look beneath the soil/ surface cover. These techniques could be used to detect some minerals directly and some others indirectly and to map geological and structural features for exploration programmes.

In this particular case, it was not necessary to employ any of the geo-physical techniques to ascertain occurrence of mineralization below. It was evident on the basis of clear cut observation of limestone at the surface to anticipate occurrence of the ore body beneath, which has been supported by drilled boreholes at regular interval 200 X 200, 100.0 M X 100.0 M and also at places it drilled in spacing of 50 M X 50 M by covering an area of 25.00 ha. Cross section were prepared at an interval of 100.0 M.

4. TECHNOLOGICAL:

i. & ii Pitting & Trenching :

Initially few pits were opened with a dimension of 0.5 mts X 0.50 mts X 1.00 mts. And all the pits have shown the positive results. There after it was planned to drill by diamond core drilling.

iii. Drilling:

the exploration, which was carried out by DMG and by NMDC was more than sufficient. Below table shows the details of exploration carried out.

Sl No.	Exploration agency	No of B H drilled	Cumulative meterage	Remarks.
1.	Department of Mines & Geology	39	2,434.19	Core drill
2.	National Mineral Development Corporation Ltd.,	14	1801.10	Core drill
	Total	53	4,235.29	

Totally 62 boreholes were drilled, after surrendering the area of **57.00 Ha** and retaining only **40.12 ha** for mining purpose, about 9 boreholes were gone outside the lease area. So only 53 boreholes are considered for reserves estimation and to establish the geological structure.

A list of boreholes drilled by DMG and NMDC is enclosed as **Annexure No. 6** and few typical logs of the same is enclosed as **Plate No. 8.** Since the exploration has been carried out by way of core drilling in early sixties by DMG & NMDC the analysis report of the same is not available. However the grades so available with the log descriptions are enclosed as **Annexure No. 7.** Two face samples of Limestone analyzed by N A B L laboratory is enclosed as **Annexure No. 8.**

A Geological plan showing the different litho unit and its structural attitudes, drilled holes are marked and enclosed as **Plate No. 5** and the geological cross sections are prepared at regular interval of 100 mts and longitudinal section has been prepared along N 950 (L – L'), showing the different lithounits and limits of proved reserves which is enclosed as **Plate No. 6 & 7.** A typical borehole logs with chemical analysis of few boreholes is enclosed as **Plate No. 8.**

iv. Exploratory mining and check drilling result:

Bulletin of Geological survey of India has been a source guide and it was desirable for carrying out any exploratory mining or drilling. Hence DMG & NMDC might have taken exploration in the said area.

v. Sampling:

Since pitting was carried out initially, the samples were prepared pit wise. But when exploration was carried out at an regular interval, drill boreholes were extended up to a depth varying from 18 - 335 mts. The samples were also analyzed at regular interval varying from 1.0 - 2.0 mts in ore column and ore sample in waste horizon.

5. PETROGRAPHIC AND MINERAGRAPHIC STUDY.

Following are details of the various litho units exposed in this mine:

Lithounits	Physical properties	Chemical properties. (%)		
		CaO	Al_2O_3	SiO_2
Soilcover	Basically it is brownish Red to Brownish in colour with fine to medium grains size.	-	2.0 – 3.0	13.0 to 15.0
Phyllite	Pale pinkish to pinkish, soft in nature fine to medium grain size	-	18 to 22	15 to 20
Limestone	Limestone occurs in this area with variegated colours such as pink, grey and black. Which was very hard and compact in nature.	35 to 55	2.50 to 8.00	5.50 to 15.50

Based on the prospecting and exploratory exercises carried out so far as said above for estimation of resource / reserves available at the subject mine, the reserves could be categorized under UNFC. Geological axis- G-1.

FEASIBILITY AXIS : F 1 FEASIBILITY STUDY

1. GEOLOGY. Regional Geology :

Basically the said area falls in Bababudan group which belong Dharwar supergroup of Precambrian age.

The central curvilinear greenstone belt of Karnataka running from south of Sindgeppina to north of Gadag. This belt is named as "Chitradurga Schist Belt", this synthesizes the stratigraphy and structure of Dharwar Super Group and it is subdivided as follows. (by Mr. Sreshachri at OSI meet – Vol. 112 – 1981)

Group	Formations	Major lithology
Dharwar Super Group	Hemyur	Greaywacke, Argillite with minor basic and intermediate volcanics, Banded Ferruginous Chert and polymictic conglomerate.
	Ingaldhal	Basic volcanics with minor proportions of Acidic fractionates, thin beds plagic sediments and sulphide / oxide facies of Iron formations
	Vanivilas	Banded Iron Formations, Manganese formations limestone Polymitic Conglomerates (Talya) and Quartzite.
	Bababudan	Iron formations with local alterations of cross bedded quartzite, amygduloi basalt

The schist belt is divisible into three tectonic stratigraphic units. The lowest unit consists of Bababudan group, which deformed into a tightly appressed syncline, the middle unit comprises the various basaltic formations and is deformed into an open fold system. The entire sequence expect for the lowest part of the Bababudan group near the contact with the basement where the grade of Metamorphism attains the lower amphibolites facies. The lithological units in this Belt include Limestone, Greenstones, quartz, amphibolites, shale and phyllite and which are metamorphosed igneous rocks.

The general strike of the lithological formation follows the trend of the hillocks which is trending NNW – SSE and the dips are easterly vertical to sub - vertical.

Local Geology

Entire area is covered with thin cap of topsoil. However, the normal succession of litho units as observed from the surface studies and updating of the geological map annually.

Topsoil
Limestone
Shale / Phyllite

The ore formations in general are associated with the Shale and Phyllite and clays on both the hanging and foot wall side. The geological formation as revealed from the field studies and exploration data is as follows:

General strike	:	NNW - SSE with local variation of 10 to 15 degrees on either side
Dip	:	moderate to sub vertical dips, general dips northerly
Thickness of	:	True thickness of both limestone and Dolomite varies from 100.00 150 meters
Type of ore	:	Limestone which is hard in nature.

A Geological plan showing the geological features is enclosed as **Plate No. 5.**

Exploration :

The exploration, which was carried out by DMG and by NMDC was more than sufficient. Below table shows the details of exploration carried out :

Sl No.	Exploration agency	No of B H drilled	Cumulative meterage	Remarks
1.	Department of Mines & Geology	39	2,434.29	Core drill
2	National Mineral Development Corporation Ltd.,	14	1,801.00	Core drill
	Total	53	4,235.29	

Totally 62 boreholes were drilled, after surrendering the area of 87.00 Ha and retaining only 40.12 ha for mining purpose, about 9 boreholes were gone outside the lease area. So only 53 boreholes are considered for reserves estimation and to establish the geological structure.

The above said 53 boreholes are drilled at an interval of 200 X 200, 100.0 M X 100.0 M and also at places it drilled in spacing of 50 M X 50 M by covering an area of 28.00 ha. Cross section were prepared at an interval of 100.0 M based on the available exploration data and the surface geological mapping coupled together, it was found that the Limestone body extends over an length of 900.0 M, width of the limestone is varying from 100.0 M to 300.0 M width an average width of 300.0 M. And the depth of the limestone is more than 100.00 M. The Bore Hole No. BGD 05, BGD17 & BGD 13 has proved the limestone deposit up a depth of 182.0 M, 335.0 M & 147.5 M respectively. But for the estimation of the reserves 652.0 MRL (i.e up to a depth of 50.0 M from the bottom most of the pit) is considered. Though, the limestone persists below, but only few boreholes has encountered, hence it is only considered up to 652.0 M MRL.

A list of boreholes drilled by DMG and NMDC is enclosed as **Annexure No. 6** and few typical logs of the same is enclosed as **Plate No. 8**. Since the exploration has been carried

out by way of core drilling in early sixties by DMG & NMDC the analysis report of the same is not available. However the grades so available with the log descriptions are enclosed as **Annexure No. 7.** Two face samples of Limestone analyzed by N A B L laboratory are enclosed as **Annexure No. 8.**

Beneficiation: NOT APPLICABLE.

2. MINING :

Existing Parameters of the working benches:

During the last Scheme of Mining period, it was proposed to work by mechanized means where the average height of the benches were maintained 6.0 mts and width of the benches were maintained 10.0 mts maintaining the pit slope of 31 degree.

Proposed parameters of the working benches:

During the last Scheme of Mining period, it was proposed to work by mechanized means where the average height of the benches were maintained 6.0 mts and width of the benches were maintained 10.0 mts maintaining the pit slope of 31 degree. The same method and mode of operation is proposed to continue in the ensuing Mining Scheme Period. This method and mode of operation is taken into account mainly by consideration of all the parameters and the geological attitudes of the ore body and mine is proposed to work with conventional opencast method of mining, in which faces are gradually advanced sideward lowering benches to win lower level ores. Mode of mining is mechanized with a bench system is adopted to work the deposit.

Based on the mode and method of mining adopted and taking into the consideration of geological parameters of the ore body and the geo-technical field observations made the end, the mining Pit is designed such that the height is about 6.00 mts and the width is 10 mts, maintaining 31° pit slope along the footwall and the hanging wall side. These slopes are designed based on conditions of the strata and structural attitudes of both hanging wall and footwall formations.

The Ultimate Pit Limit so drawn on the basis of the field studies, exploration data and the updated geological mapping carried out so far in the area remains very tentative. However, based on the future exploration the defined **ULTIMATE PIT LIMIT** is likely to change. The said Ultimate Pit Limit is demarcated on the geological plan and enclosed as **Plate No. 6.**

Since there is drilling and blasting in the said mine to excavate / exploit the ore, initially, it will be drilled and blasted. Hydraulic excavators will be deployed for removal/winning excavation of the ore and loading the same in tipper trucks. For transportation of loose quantity will be used to stock yard, sub-grade stock and even up to Factory. Since the Limestone is hard in nature the drilling and blasting will be restricted only for this hard strata. While the wastes are soft in nature the same will be removed with the help of the excavators. The ore and waste will be exploited separately. The waste will be carried to the waste dump and it will be disposed off. The ore will be carrier to the to the Steel factory for the manufacture of Iron & Steel. The roads with in the pit will be maintained at 1 : 15 gradient, where ever it is not possible to maintain due to practical constraints it will be maintained at 1 : 12.

For the future development and production a systematic mine working is proposed for the next five years keeping the long benches and good width for the movement of the mining machineries and for transportation. One Motor grader / wheel loader will be continuously deployed for road mairtenance for smoother operation of the mining machineries and transportation.

Drilling and Blasting:

Since the mining is proposed to work by mechanized and the benches are kept 6.0 mts height and the limestone is a material which is hard to very hard in nature it requires the drilling and blasting to exploit the same. On an average about 300 – 350 tonnes of material required to be drilled and blast.

The broad blasting parameters are determined for the blasting pattern and blast design, which are as follows:

Blast hole diameter is normally 115 mm and the depth of the hole is 7.0 meters inclusive of sub grade drilling of 1.0 meters to avoid toe formation. Blasting pattern is generally square or staggered with burden ranging from 3.0 to 3.5 meters and spacing of 3.5 to 4.0 meters. Usually single / double row of holes is blasted along free face to achieve optimum powder factor, best fragmentation and minimized adverse impacts on account of blasting. Maximum numbers of holes will be blasted at a time in a round are generally limited to 15 to 20 with normal delay detonators to mitigate adverse impacts such as air blast, throw and the ground vibration. Holes are electrically detonated using electric detonators.

ANFO types of explosives are used for blasting with 20 to 25 percent proportion of primer booster cartridges and rest as column charge. About 2.0 kgs of explosives are loaded in the

mm diameter holes and powder factor ranging between 5 to 8 tons per kgs of explosives is achieved.

Waste Disposal:

During the scheme period, presently, the existing north western dump which lies within the lease area will be laterally extended by occupying an additional area of 0.750 ha. This area can accommodate about 1,20,000 tonnes of waste. The dumping will be done up to 720 MRL where the average height will be 10 M. This area is sufficient for the first two year of the ensuing scheme period. The waste generating during the next three years will be dumped over the said dump up to 730 MRL after leaving 10 – 15 M barrier from the edge of the dump.

The waste such as clay, shale and phyllite, will be dumped in the area earmarked for the purpose such that the height of the dump will not exceed 20.0 M. Initially the dumping will be done up to 720 MRL (10.0 M height) there after the same dump will be increased by additional height of 10.0 M (up to 730.0 MRL), terracing and pitching will be done at an interval of 10.0 M.

The waste generated during the scheme period will be dumped within the lease area, earmarked for the purpose. The land profile chosen for the dumping is plateau with minor undulation, initially it will be dumped up to 720 MRL (10.0 M height) there after the same dump will be increased by additional height of 10.0 M (up to 730.0 MRL), terracing and pitching will be done at an interval of 10.0 M. The build up of dumps on yearly basis is indicated in **Plate No. 9 to 13**. And a Cross Section showing the year wise Dump disposition is shown in **Plate No. 15.**

Waste generated at the mine is transported to dumping site by ten-ton capacity tippers. A wheel loader is continuously provided to level waste material unloaded by tipper Trucks and spread laterally in area earmarked. Continuous movements of tipper trucks while unloading consolidate the ground. Water is regularly sprinkled in rounds over the dumps to control the blowing dust. Thus, with dozing, ere tipping and consolidation dump is built up in stages.

While building up, dumps are properly graded and terraced with provision of contour drainage. Terracing is always accompanied with plantation for stabilization of terraced slopes. As far as possible, dumps are created in low-lying areas. It is always ensured that, dump height does not exceed 30.0 M or tallest growing trees of the region. Dump slopes are suitably protected from any environmental damages.

Below table shows the list of mining machineries deployed at this mines:

Sr. No	Equipment / Machinery	Manufacturer	No. of units	Engine H P	Capacity	Loading rate / Hr.
1	Hydraulic Excavator	Komatsu L&T	1	110	0.9 Cu.M.	200 tons
2	Water Tanker	TATA	1	120	8,000 ltr.	
3	Passenger Van	TATA	1	65	15 Seater	
4	Screw compressor	Ingersol Rand	1	169	450 cfm	
5	Wheel Loader		1	210	1.8 Cu.M	200 tons
6	Drill machine	Atlas Copco	2		90-115mm	
7	Tippers	Tata	15	115	10.0 tonnes	

With efficiency (i.e. availability & utility) as specified for the 1 hydraulic excavator deployed at this mine can handle **0.288 million tonnes** of material as given below:

300 working day's X 8-hrs/day X standard rate of handling 200 T/hr. X average efficiency 80 % X average availability 75 % X No. of units 1 = **0.288 million tonnes**. As said above the maximum to be handled is **0.175 million tonnes** during the second year of scheme period.

Though one loading unit is more sufficient to handle the required capacity one more wheel loader is kept for handling the waste materials and also it will be used for miscellaneous work such as dump leveling and clearing of haulage roads and etc,

Man power requirement:

The said mine is expected to provide direct employment to about 100 people and generate indirect employment for few hundred people on recommencement of mining operations. The respective distribution/ numbers are follows.

Highly skilled : 05 nos., such as technical professionals like Mines Managers, Mining Engineer, Asst. Mines Manager, Geologist and Surveyor

Skilled : 10 nos., under skilled category of people includes mining foreman, mining mates, heavy earth moving machines operators, drivers, mechanics and asst. mechanics etc.

Semi skilled : 07 nos. include helpers, greaser's etc.

Un skilled : 05 nos. include spotters, cleaners, attendant's etc.

3. ENVIRONMENT: The EIA & EMP studies including the zone of influence impact of the mine has been completed.

Reclamation & Rehabilitation:

As of now there is no any plan of reclamation or rehabilitation in the form of backfilling in the said mine, as no whole or part of the pit is going to exhaust. But however the reclamation such as plantation and environmental protective measures will be carried out.

Socio Economic Benefits arising out of Mining :

The company is the Public sector, as it's Corporate Social Responsibility, following activities were carried out.

Peripheral development under CSR activities

Sl No	Year		Remarks
1	2009-10	Family welfare development programme	
2	2010-11	Re productive child Health	
3		Free Medical check up camp at Dodderi, Gangour, Bhadinchal, Bhadiguad Villages.	
4		Note Book Distributed in the schools of Bhadiguad, Bhadinchal, Gangour, Dodderi, Belegoie, Dyra Camp	
		Distributed furnishers of Desks, benches and Tables to near by schools of BGD Mines	
5	2011-12	New Drinking water pipe line for Gangour School	
6		Constructed Community Hall at Bhadanchal Village.	
7		Constructed Bus shelter at Udayanagara Village.	
8		Free Eye camp for local people done by under CSR activities	
9	2012-15	Distributed 3 Nos of Computers with UPS & Printer for Near by schools (Dodderi, Bhadanchal, Gangaru Villages	
10		Books distributed for all schools near by BGD Mines	
11		Schools Bags distributed for all schools near by BGD Mines	
Organizing free Medical check up camp on first Sunday of every month at surrounding villages of BGD Mines.			

Mining sites are generally remote and under developed. Standard of living of people in such areas is normally low, therefore due to industrial activity like mining, people residing in the nearby villages within the buffer zone are to be benefited by direct and indirect employment opportunities created by the mining activities. People are also beneficiaries for the facilities developed due to mining activity.

lessee already provided required Medical facility to all the employees at the mines such as first aid, regular medical checkup and ambulance etc., in addition lessee will also provide the medical checkup camps to the local villagers, supply of drinking water, contribution of funds for social and cultural programmes.

Mining activity will contribute towards economic upliftment by way of job opportunities in the region. Hence there will be an increase in population of the area. Mining activity will also boost the ancillary industries, business and market establishments. There is benefit to the state government by way of royalty and the nation earns valuable foreign exchange

4. **PROCESSING / BENEFICIATION :** NOT APPLICALE

5. **INFRASTRUCTURE AND CONSTRUCTION:**

This mine is working since from 1963, and the required infrastructural facilities are provided at the mine site such as rest shelter, transportation to employees, quarters and etc., This lease is well connected to the taluka and district head quarter. Bhadravathi is the Taluk head quarter is at a distance of 20.0 kms and Shimoga is the district head cuarter which is at a distance of 42.00 kms from mine site. Bangalore and mangalore is the nearest Airport which is at a distance of 250.0 and 230 kms respectively.

The drinking water will be supplied from a bore well and an open well located near by the lease / nearby village. A resident Medical Officer and dispensary will be made available for immediate medical requirement of the employees. Most of the mine employees will be provided with residential quarters near the mine site.

The water requirement for spraying of roads, etc. will be met with from a bore well and an open well bore well located near by the lease / nearby village

6. **COSTING:** Following are parameters considered for the costing to remove one tonne of ore:

Heads	Cost in Rs
Mining	120.00
Expense towards C S R - per tonne	100.00
Depreciation	5.00
Interest	5.00
Royalty	70.00
Miscellaneous	10.00
Over head cost	10.00
Total	220.00

The above cost is a very approximate, where as due to the market condition the above sale cost may vary accordingly.

7. **MARKETING:**

Since they have their own steel manufacturing industry it will be consumed as domestic and captive use. Hence the marketing of the R O M will not arise.

8. **ECONOMIC VIABILITY:**

Basically the material generated at this mine is used for their own captive steel manufacturing industry, the purchase cost is directly profit to the company, hence it is economically viable.

9. **OTHER FACTORS:**

Since the lessee is professionally mining and also a public sector, and the company is in field since a few decades. Separate departments are there to look after the statutory and other provision relating to labour, mining, taxation and others.

With due emphasis on the mineral conservation, the mine will be worked systematically and scientifically. The lower grades / sub grades ore will be suitable blended and dispatched, or market will be evolved. In any case if such minerals can not be marketed it will be stacked separately at the mine site. However the lessee is having the concept of commissioning of beneficiation plant in future the same will be beneficiated and will be marketed.

Based on the above data / description the Feasibility Axis attains F 1.

ECONOMIC AXIS : E 1 (ECONOMIC)

1. **DETAILED EXPLORATION:**

The exploration, which was carried out by DMG and by NMDC was more than sufficient. Below table shows the details of exploration carried out.

Sl No.	Exploration agency	No of B H drilled	Cumulative meterage	Remarks.
1.	Department of Mines & Geology	39	2,434.19	Core drill
2.	National Mineral Development Corporation Ltd.,	14	1,801.10	Core drill
	Total	53	4,235.29	

Totally 62 boreholes were drilled, after surrendering the area of **57.00 Ha** and retaining only **40.12 ha** for mining purpose, about 9 boreholes were done outside the lease area. So only 53 boreholes are considered for reserves estimation and to establish the geological structure.

A list of boreholes drilled by DMG and NMDC is enclosed as **Annexure No. 6** and the typical logs of the same is enclosed as **Plate No. 8.** Since the exploration has been carried out by way of core drilling in early sixties by DMG & NMDC the analysis report of the same is not available. However the grades so available with the log descriptions are enclosed as **Annexure No. 7.** Two thee samples of Limestone analyzed by N A B L laboratory is enclosed as **Annexure No. 8.**

2. MINING REPORT / MINING PLAN / WORKING MINES :

Presently this lease is having a valid Scheme of Mining prepared for the year 08 -09 to 2012-13 and the same was approved vide your office letter No. MS / SMG / Lst – 1 / 2 – 82 dated 27.06.2008 a copy of the said approval letter is enclosed as **Annexure No. 2.** The said Scheme of Mining is valid till 31.03.2013. Similarly a Scheme of Mining needs to be prepared for the forth coming years i.e from 2013 – 14 to 2017 – 18 for a period of five years and accordingly the said ensuing scheme has been prepared and submitting for your kind approval.

3. SPECIFIC END USE GRADES OF RESERVES (ABOVE ECONOMIC CUT - OFF GRADE) :

Limestone produced form this mine will be utilized for their own Steel manufacturing captive Industry situated in Bhadravathy. Mainly the sub grade mineral in this mine is the limestone which is categorized as low CaO. Though it is low CaO the Cao is ranging from 35 to 45 % which is about 37.36 % of the total reserves. Since the limestone generated in this mine is used for their captive steel industry situated at Bhadravathy, the low Cao will be blended proportionately along with the CaO and the same will be fed to the captive steel industry. Due to any constraints if the same can not blended it will be stacked in the area earmarked for the purpose.

4. SPECIFIC KNOWLEDGE OF FOREST / NON FOREST AND OTHER LAND USE DATA.

Out of the total lease area admeasuring 40.21 Ha, entire area falls under Forest.

The land use as on date, till the plan period and up to conceptual period is shown in below table:

The land use details as at present, till scheme period and Conceptual stage is shown in the below table:

Unit of Ha.

Type of activity	Present	Scheme	End of the Mine's life
Area under mining	27.500	27.500	25.250
Storage for top soil	0.500	0.500	0.500
Overburden/ Dumps	2.000	2.750	6.500
Mineral storage / Sub-grade stack	0.500	0.500	0.500
Infrastructure (Workshops, Office)	0.500	0.500	0.500
Roads	0.750	0.750	0.750
Railways	-		-
Green Belt / plantation	1.800	5.800	5.800
Tailing Pond	-	-	-
Effluent Treatment Plant /factory	-		-
Mineral Beneficiation Plant	-		-
Township Area	-		-
Others (to be specified): Canal			
Area remains undisturbed.	12.770	8.020	0.320
Total	**40.120**	**40.120**	**40.120**

Thus in brief the Conceptual Mining Plan of said mines envisages a methodical & conscientious approach to mine development.

Hence based on all the above factors the Economic Axis attains E 1.
In view of all the above said details / description, the said mine stands 1 1 1 category under U N F C classification.

ANNEXURE NO 13

BHADRUND LIMESTONE MINE OF M/s SAIL - VISL Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE RESOVED RESERVES ESTIMATION AS ON 25.02.2013 - 2.2.2

Between Cross Sections		average sectional area in M^2			Average Strike Length	volume in M^3			tonnage in '000 TONS		
		CaO %				CaO %			CaO %		
		+ 45	+ 35 / - 45	Total		+ 45	+ 35 / - 45	Total	+ 45	+ 35 / - 45	Total
		High	Low		in Mts.	High	Low		High	Low	
E : 800	E : 1000	3,100.00	267.1	3,367.1	100	341,000	56.21	273.21	817	131	947
E : 1000	E : 1100	6,475.20	1,222.43	7,698.42	100	647,520	122.24	769,842	1,553	293	1,847
E : 1100	E : 1200	5,035.47	1,363.19	6,398.43	100	503,547	136.000	639,547	1,207	328	1,535
E : 1200	E : 1300	4,095.38	2,513.53	6,608.91	100	409,538	301.06	793,098	983	1,370	2,356
E : 1300	E : 1400	2,016.84	4,025.36	6,042.1	100	201,684	402.536	604,220	484	966	1,450
E : 1400	E : 1450	597.80	-	597.80	50	89,634	-	89,634	215	-	215
E : 1450	E : 1650	-	-	-	00	-	-	-	-	-	-
E : 1650	E : 1750	-	-	-	00	-	-	-	-	-	-
Total		22,851.29	2,291.51	24,442.1	100	2,145,953	1,229,006	3,473,895	5,265	3,919	8,251

the tonnage figures are arrived after considering 10 recovery percentage. tonnage figures are rounded to two decimal

BHADRUND LIMESTONE MINE OF M/s SAIL - VISL Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE INFERRED REMAINING RESERVE ESTIMATION AS ON 25.02.2013 - 2.2.2

Between Cross Sections		average sectional area in M^2			Average Strike Length	volume in M^3			tonnage in '000 TONS		
		CaO %				CaO %			CaO %		
		- 45	+ 35 / - 45	Total		+ 45	+ 35 / - 45	Total	- 45	+ 35 / - 45	Total
		High	Low		in Mts.	High	Low		High	Low	
E : 400	E : 600	-	-	-	100	-	-	-	-	-	-
600	E : 800	-	-	-	100	-	-	-	-	-	-
800	E : 900				100						
900	E : 1000	-	-	-	100	-	-	-	-	-	-
1000	E : 1100	3,337.25	-	3,337.25	100	334,525	-	334,525	834	-	834
1100	E : 1150	3,559.05	-	3,559.05	150	309,553	-	309,553	1,239	-	1,239
1150	E : 1650	-	-	-	100	-	-	-	-	-	-
1650	E : 1750				100						
Total		6,778.05		6,778.05	100	847,578		847,578	2,012		2,012

the tonnage figures are arrived after considering 10 recovery percentage. tonnage figures are rounded to two decimal

KANTHARAJ K.
RQP/GOA/130/2000/A

K.T.RANACHANDRA
RQP/BNG/040/88/A

BHADRUND LIMESTONE MINE OF M/s SAIL - VISL Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE INFERRED REMAINING RESERVE ESTIMATION AS ON 25.02.2013 - 2.2.2

Between Cross Sections		average sectional area in M^2			Average Strike Length	volume in M^3			tonnage in '000 TONS		
		CaO %				CaO %			CaO %		
		+ 45	+ 35 / - 45	Total		+ 45	+ 35 / - 45	Total	+ 45	+ 35 / - 45	Total
		High	Low		in Mts.	High	Low		High	Low	
E : 800	E : 1000	1,204.47	-	1,204.47	100	120,043	-	120,043	297		297
E : 1000	E : 1100	3,077.39	-	3,077.39	100	307,739	-	307,739	731		731
E : 1150	E : 1200	2,951.58	-	2,951.58	100	295,158	-	295,158	654		654
E : 1200	E : 1300	3,280.38	-	3,280.03	100	328,038	-	328,038	779		779
E : 1300	E : 1400	3,226.39	-	3,200.00	100	320,039	-	320,381	1,203		1,203
E : 1400	E : 1550	2,814.25	-	2,814.25	150	422,137	-	422,137	1,004		1,004
E : 1550	E : 1650	-	-	-	100	-	-	-	-	-	-
E : 1650	E : 1750	-	-	-	100	-	-	-	-	-	-
Total		19,110.23	-	19,110.23	100	1,374,737	-	1,374,737	4,668	-	4,668

the tonnage figures are arrived after considering 10 recovery percentage. tonnage figures are rounded to two decimal

BHADRUND LIMESTONE MINE OF M/s SAIL - VISL Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE INFERRED REMAINING RESERVE ESTIMATION AS ON 25.02.2013 - 2.2.2

Between Cross Sections		average sectional area in M^2			Average Strike Length	volume in M^3			tonnage in '000 TONS		
		CaO %				CaO %			CaO %		
		+ 45	+ 35 / - 45	Total		+ 45	+ 35 / - 45	Total	+ 45	+ 35 / - 45	Total
		High	Low		in Mts.	High	Low		High	Low	
E : 800	E : 1000	268.3	88.43	356.74	100	26,827	8,843	35,674	67	21	88
E : 1000	E : 1100	2,890.47	99.62	2,990.09	100	289,047	9,962	299,009	686	23	709
E : 1100	E : 1150	3,147.71	307.17	3,454.88	100	314,771	30,717	345,488	799	73	872
E : 1150	E : 1200	2,762.13	781.15	3,543.28	100	276,213	78,115	354,328	656	91	747
E : 1200	E : 1400	1,140.98	4,931.18	5,072.16	100	114,098	493,118	507,216	94	1,167	1,261
E : 1400	E : 1550	1,821.18	4,227.97	6,049.15	150	273,176	634,195	907,372	648	1,506	2,154
E : 1650	E : 1650	3,597.38	401.21	3,797.59	100	359,738	40,121	379,859	854	95	902
E : 650	E : 1750	1,570.32	404.21	1,974.53	100	157,032	40,421	197,453	373	96	469
Total		17,202.33	20,203.31	27,295.32	100	1,884,902	1,232,190	3,032,842	4,271	2,926	7,197

the tonnage figures are arrived after considering 10 recovery percentage. tonnage figures are rounded to two decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 14 - 15

Between Cross Sections		average sectional area in M² (WASTE)			Average Strike Length in Mts.	volume in M³ (WASTE)			tonnage in TONNAGE (WASTE)		
		+45 High	+35 / -45 Low	Total		+45 High	+35 / -45 Low	Total	+45 High	+35 / -45 Low	Total
E / 900	E / 1000	-	-	-	100	-	-	-	-	-	-
E / 1000	E / 1100	168.43	-	168.43	100	16,843	-	16,843	45	-	45
E / 1100	E / 1200	92.42	42.31	210.93	100	16,847	4,231	21,077	45	11	56
E / 1200	E / 1300	-	42.31	42.31	100	-	4,231	4,231	-	11	11
E / 1300	E / 1400	-	-	-	-	-	-	-	-	-	-
Total		386.9	84.62	421.69	100	33,690	8,462	42,152	90	22	112

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 14 - 15

Between Cross Sections		average sectional area in M² (ORE) Cal %			Average Strike Length in Mts.	volume in M³ (ORE) Cal %			tonnage in TONNAGE (ORE) Cal %		
		+45 High	+35 / -45 Low	Total		+45 High	+35 / -45 Low	Total	+45 High	+35 / -45 Low	Total
E / 900	E / 1000	20.32	-	20.32	100	2,032	-	2,032	7	-	7
E / 1000	E / 1100	168.43	-	168.43	100	16,843	-	16,843	59	-	59
E / 1100	E / 1200	117.09	+6.31	165.09	100	11,709	631	16,501	41	11	52
E / 1200	E / 1300	-	+6.31	46.31	100	-	4,631	4,631	-	11	11
E / 1300	E / 1400	-	-	-	-	-	-	-	-	-	-
Total		305.84	12.62	318.46	100	30,584	5,262	41,106	107	22	129

Note: the average figures are rounded after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 15 - 16

Between Cross Sections		average sectional area in M² (WASTE) Cal %			Average Strike Length in Mts.	volume in M³ (WASTE) Cal %			tonnage in TONNAGE (WASTE) Cal %		
		+45 High	+35 / -45 Low	Total		+45 High	+35 / -45 Low	Total	+45 High	+35 / -45 Low	Total
E / 900	E / 1000	126.32	-	253.32	100	12,632	-	12,632	44	-	44
E / 1000	E / 1100	204.23	-	253.23	100	11,023	-	11,023	39	-	39
E / 1100	E / 1200	81.21	-	81.21	100	8,121	-	8,121	28	-	28
E / 1200	E / 1300	-	-	-	100	-	-	-	-	-	-
Total		391.86	-	391.86	100	47,195	-	47,195	166	-	166

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 16 - 17

Between Cross Sections		average sectional area in M² (ORE) Cal %			Average Strike Length in Mts.	volume in M³ (ORE) Cal %			tonnage in TONNAGE (ORE) Cal %		
		+45 High	+35 / -45 Low	Total		+45 High	+35 / -45 Low	Total	+45 High	+35 / -45 Low	Total
E / 900	E / 1000	20.32	-	20.32	100	2,032	-	2,032	7	-	7
E / 1000	E / 1100	216.43	-	216.43	100	21,643	-	21,643	80	-	80
E / 1100	E / 1200	181.05	-	181.05	100	18,105	-	18,105	67	-	67
E / 1200	E / 1300	-	-	-	100	-	-	-	-	-	-
Total		417.80	-	417.80	100	41,780	-	41,780	154	-	154

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 17 - 18

Between Cross Sections		average sectional area in M² (WASTE) Cal %			Average Strike Length in Mts.	volume in M³ (WASTE) Cal %			tonnage in TONNAGE (WASTE) Cal %		
		+45 High	+35 / -45 Low	Total		+45 High	+35 / -45 Low	Total	+45 High	+35 / -45 Low	Total
E / 900	E / 1000	-	-	-	100	-	-	-	-	-	-
E / 1000	E / 1100	421.01	-	421.01	100	42,101	-	42,101	155	-	155
E / 1100	E / 1200	141.09	70.45	211.53	100	14,109	7,045	21,153	52	26	78
E / 1200	E / 1300	118.95	23.47	165.42	100	11,895	2,347	16,542	44	9	61
E / 1300	E / 1400	-	-	-	100	-	-	-	-	-	-
Total		682.05	93.92	811.05	100	68,205	9,392	81,105	251	35	299

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

KANTHARAJ K.
RGP/GDA/13012/2001/A

K.T. RAMACHANDRA
RGP/DNG/1140/2018/A

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 14 - 15

Between Cross Sections		average sectional area in M² (WASTE)			Average Strike Length in Mts.	volume in M³ (WASTE)			tonnage in TONNAGE (WASTE)		
		overburden	interburden	Total		overburden	interburden	Total	overburden	interburden	Total
E / 900	E / 1000	-	-	-	100	-	-	-	-	-	-
E / 1000	E / 1100	117.18	9.47	126.65	100	11,718	947	12,665	41	3	44
E / 1100	E / 1200	181.94	23.61	175.55	100	18,194	2,361	17,555	64	8	62
E / 1200	E / 1300	-	-	-	-	-	-	-	-	-	-
Total		299.44	42.1	299.52	100	29,944	4,213	29,899	105	15	105

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 14 - 15

Between Cross Sections		average sectional area in M² (ORE) waste rock / ore basis			Average Strike Length in Mts.	volume in M³ (ORE) waste rock / ore basis			tonnage in TONNAGE (ORE) waste rock / ore basis		
		WASTE overburden	WASTE interburden	Total		WASTE overburden	WASTE interburden	Total	WASTE overburden	WASTE interburden	Total
E / 900	E / 1000	-	-	-	100	-	-	-	-	-	-
E / 1000	E / 1100	-	9.47	9.47	100	-	947	947	-	3	3
E / 1100	E / 1200	117.18	9.47	126.65	100	11,718	947	12,665	41	3	44
E / 1200	E / 1300	147.37	4.2	151.57	100	14,737	421	15,158	52	1	53
Total		264.54	23.13	287.69	100	26,454	2,315	28,770	93	8	101

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 15 - 16

Between Cross Sections		average sectional area in M² (WASTE) waste rock / ore basis			Average Strike Length in Mts.	volume in M³ (WASTE) waste rock / ore basis			tonnage in TONNAGE (WASTE) waste rock / ore basis		
		WASTE overburden	WASTE interburden	Total		WASTE overburden	WASTE interburden	Total	WASTE overburden	WASTE interburden	Total
E / 900	E / 1000	-	9.47	9.47	100	-	947	947	-	3	3
E / 1000	E / 1100	-	9.47	9.47	100	-	947	947	-	3	3
E / 1100	E / 1200	-	4.73	4.73	100	-	473	473	-	1	1
Total		-	23.67	23.67	100	-	2,367	2,367	-	8	8

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 16 - 17

Between Cross Sections		average sectional area in M² (WASTE) waste rock / ore basis			Average Strike Length in Mts.	volume in M³ (WASTE) waste rock / ore basis			tonnage in TONNAGE (WASTE) waste rock / ore basis		
		WASTE overburden	WASTE interburden	Total		WASTE overburden	WASTE interburden	Total	WASTE overburden	WASTE interburden	Total
E / 900	E / 1000	-	-	-	100	-	-	-	-	-	-
E / 1000	E / 1100	-	11.83	11.83	100	-	1,183	1,183	-	4	4
E / 1100	E / 1200	-	14.2	14.2	100	-	1,420	1,420	-	5	5
Total		-	26.03	26.03	100	-	2,603	2,603	-	9	9

Note: the tonnage figures are arrived after considering 45 recovery percentage. tonnage figures are rounded to nearest decimal

BHADRADRI LIMESTONE MINE OF M/s SAIL - VISL-Bhadravathi

DETAILS OF CROSS - SECTION WISE / GRADE WISE AREA, VOLUME & TONNAGE CALCULATION FOR THE YEAR 17 - 18

Between Cross Sections		average sectional area in M² (WASTE) waste rock / ore basis			Average Strike Length in Mts.	volume in M³ (WASTE) waste rock / ore basis			tonnage in TONNAGE (WASTE) waste rock / ore basis		
		WASTE overburden	WASTE interburden	Total		WASTE overburden	WASTE interburden	Total	WASTE overburden	WASTE interburden	Total
E / 900	E / 1000	-	-	-	100	-	-	-	-	-	-
E / 1000	E / 1100	-	4.73	4.73	100	-	473	473	-	1	1
E / 1100	E / 1200	-	33.14	7.65	100	-	1,765	1,765	-	6	6
E / 1200	E / 1300	-	4.73	4.73	100	-	473	473	-	1	1
Total		-	42.60	17.11	100	-	2,711	2,711	-	9	9

Note: section cross recorded in dry season

BHADRAVATHY

BHADRAGUND LIME STONE MINE OF M/s SAIL - VISL - BHADRAVATHY

YEAR WISE PROPOSAL FOR ITEM NO. 6 & 7 OF PNCP (2013 - 14 / First Term)

ITEMS	DETAILS	PROPOSED AREA (Ha)	PROPOSED QUANTITY	EXPENDITURE (Rs) PROPOSED	REMARKS
(A) RECLAMATION AND REHABILITATION OF MINED OUT PIT AREA	i) Backfilling (within the lease) ii) Afforestation on the backfilled area iii) others (please specify) e.g. afforestation on exhausted benches (a) Benches (b) Waste spot	NIL	NIL		
			W H		
(B) STABILISATION AND REHABILITATION OF DUMPS (within lease)	(i) Terracing (ii) Pitching (iii) Construction of parapet wall (iv) Construction/ Check dam (v) Construction of settling pond (vi) Afforestation on dumps (vii) others - trench		TC 13 1 250 0.75 1.00 saplings 0 750 0.5 0.5	40,300.00 105,306.00 - - 82,500.00	
(C) REHABILITATION OF BARREN AREA (within lease)	(i) Afforestation - Near other (ii) others (please specify)	0.750	saplings 2250	225,000.00	
(D) ENVIRONMENTAL MONITORING (over and & Buffer zone separately)	(i) Ambient Air Quality (ii) Noise Quality (iii) Noise level survey (iv) Ground Vibration (vii) others Dust suppression	8 days a month Once a season Once a season no blastings proposed NIL		300,000.00 230,000.00	as per MoEF Guidelines by Recognised laboratory.
			Total	987,500.00	

KANTHARAJ K.
RQP/GOA/151/2004/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

BHADRAVATHY

BHADRAGUND LIME STONE MINE OF M/s SAIL - VISL - BHADRAVATHY

YEAR WISE PROPOSAL FOR ITEM NO. 6 & 7 OF PNCP (2014 - 15 / Second Term)

ITEMS	DETAILS	PROPOSED AREA (Ha)	PROPOSED QUANTITY	EXPENDITURE (Rs) PROPOSED	REMARKS
(A) RECLAMATION AND REHABILITATION OF MINED OUT PIT AREA	(i) Backfilling (within the lease) (ii) Afforestation on the backfilled area (iii) others (please specify) e.g. afforestation on exhausted benches (a) Benches (b) Waste spot	NIL	NIL		
			W H		
(B) STABILISATION AND REHABILITATION OF DUMPS (within lease)	(i) Terracing (ii) Pitching (iii) Construction of parapet wall (iv) Construction/ Check dam (v) Construction of settling pond (vi) Afforestation on dumps (vii) others - trench	50000	50 10 1 250 0.75 1.00 saplings 1 250 0.5 0.5	200,000.00 93,000.00 - - 93,000.00	
(C) REHABILITATION OF BARREN AREA (within lease)	(i) Afforestation - Near other (ii) others (please specify)	0.750	saplings 2253	225,000.00	
(D) ENVIRONMENTAL MONITORING (over and & Buffer zone separately)	(i) Ambient Air Quality (ii) Noise Quality (iii) Noise level survey (iv) Ground Vibration (vii) others Dust suppression	8 days a month Once a season Once a season no blastings proposed NIL		300,000.00 230,000.00	as per MoEF Guidelines by Recognised laboratory.
			Total	1,093,000.00	

KANTHARAJ K.
RQP/GOA/151/2004/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

ANNEXURE NO. 12

...ING AND LIME STONE MINE OF M/s SAIL - VISL - BHADRAVATHY

YEAR WISE PROPOSAL FOR UTILISATION & T OF PMCP (2015 - ... Third Year)

ITEMS	DETAILS	PROPOSED AREA (HA)	PROPOSED QUANTITY	EXPENDITURE Rs. PROPOSED	REMARKS
A) RECLAMATION AND REHABILITATION OF MINED OUT AREA	(i) Backfilling (within the lease) (ii) Afforestation in the backfilled area (iii) others (please specify) e.g. afforestation on reclaimed benches (iv) Pits/cultivs (v) Peric ipes	NIL	NIL		
(B) STABILISATION AND REHABILITATION OF DUMPS (within lease)	(i) Terracing (ii) Pitching (iii) Construction of pitched wall (iv) Construction of Check dam (v) Construction of settling pond (vi) Afforestation on dump (vii) others - specify	1.020.00	L W H 100 10 1 150 0.75 1.00 saplings 0 150 0.5 0.5	803,500.00 - - - 22,500.00	
(C) REHABILITATION OF BARREN AREA (within lease)	(i) Afforestation - Near office (ii) others (please specify)	0.500	saplings 1500	150,000.00	
(D) ENVIRONMENTAL MONITORING (core zone & Buffer zone separately)	(i) Ambient Air Quality (ii) Water Quality (iii) Noise level survey (iv) Ground Vibration (v) others Dust suppression	5 days a month Once a season Once a season no blasting a proposed N I L		500,000.00 250,000.00	as per MoEF Guidelines by Recognised laboratory.
			Total	1,185,500.00	

KANTHARAJ K.
RQP/GOA/132/2000/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

...ND LIME STONE MINE OF M/s SAIL - VISL - BHADRAVATHY

...YEAR WISE PROPOSAL FOR UTILISATION & T OF PMCP (2016 - ... Fourth Year)

ITEMS	DETAILS	PROPOSED AREA (HA)	PROPOSED QUANTITY	EXPENDITURE Rs. PROPOSED	REMARKS
...LAMATION AND ...HABILITATION OF ...ED OUT AREA	(i) Backfilling (within the lease) (ii) Afforestation in the backfilled area (iii) others (please specify) e.g. afforestation on reclaimed benches (iv) Pits/cultivs (v) Peric ipes	NIL	NIL		
...BILISATION AND ...HABILITATION OF ...PS (within lease)	(i) Terracing (ii) Pitching (iii) Construction of pitched wall (iv) Construction of Check dam (v) Construction of settling pond (vi) Afforestation on dump (vii) others - specify		L W H 150 0.75 1.00 saplings 0 150 0.5 0.5	- 60,000.00 - - - 22,500.00	
...HABILITATION ...BARREN AREA ...in lease)	(i) Afforestation - Near office (ii) others (please specify)	1.000	saplings 3000	300,000.00	
...VIRONMENTAL ...NITORING (core zone ...fferzone separately)	(i) Ambient Air Quality (ii) Water Quality (iii) Noise level survey (iv) Ground Vibration (v) others Dust suppression	5 days a month Once a season Once a season no blasting a proposed N I L		380,000.00 250,000.00	as per MoEF Guidelines by Recognised laboratory.
			Total	935,310.00	

KANTHARAJ K.
RQP/GOA/132/2000/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

ANNEXURE NO. 19

BHADRGUND LIME STONE MINE OF M/s. SAIL - VISL - BHADRAVATHY

YEAR WISE PROPOSAL FOR ITEM NO. 6 & 7, OF PMCP (2017 - 18 to Sixth Year)

ITEMS	DETAILS	AREA (HA)	PROPOSED EXPENDITURE (Cost of work) Rs.			REMARKS
			QUANTITY	UNIT	COST/UNIT	
(A) RECLAMATION AND REHABILITATION OF MINED OUT PIT AREA	(i) Backfilling (within the lease) (ii) Plantation at the backfilled area (iii) others (please specify) viz. afforestation on unbursed boundary (a) Pits/other (c) Fence work	NIL	NIL			
(B) STABILISATION AND REHABILITATION OF DUMPS (within lease)	(i) Terracing (ii) Pitching (iii) Construction of gunnypitwall (iv) Construction of bench dam (v) Construction of settling pond (vi) Afforestation on dump (vii) others - trench		W 100 150 saplings 130	H 30 100 0.5	1 1.00 0.5	400,000.00 63,000.00 - - - 15,000.00	
(C) REHABILITATION OF SOCIAL AREA (within lease)	(i) Afforestation - Forest office (ii) others (please specify)	300	saplings	3000		300,000.00	
(D) ENVIRONMENTAL MONITORING (Lease area & Hinterland separately)	(i) Ambient Air Quality (ii) Water Quality (iii) Noise level survey (iv) Ground Vibration (vii) others Land environment	5 days a month Once in season Once in season as Hastings proposed NIL				300,000.00 240,000.00	as per Monitoring Guidelines by Recognised laboratory
			Total			1,528,000.00	

KANTHARAJ K.
RQP/GOA/130/2009/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

ANNEXURE NO. 20

स्टील अथॉरिटी ऑफ इण्डिया लिमिटेड
STEEL AUTHORITY OF INDIA LIMITED
विश्वेश्वराया आयरन एण्ड स्टील प्लान्ट
VISVESVARAYA IRON & STEEL PLANT

Date: 15.09.2013

To,

The Regional Controller of Mines,
Indian Bureau of Mines,
#29, Industrial suburb, Goraguntepalya,
Yeshwanthpur – BANGALORE.

Dear Sir,

Sub: Submission of Bank guarantee in respect of our Bhadrgund Limestone Mines leans the M.L No. 2060 extends over an area of 40.12 ha. situated in Bandigudda Village Bhadravathi Taluk, Shimoga District of Karnataka State.

Ref: Zonal office letter No. KNT/SMG/MS/Lse-192-S2/309 Dated: 12/2/2013 received

With reference to the above subject, we have submitted the Scheme of Mining in respect of Bhadrgund Limestone Mine. In connection with we are in receipt of the above said reference letter and requesting us to submit five bound copies of the scheme of mining for the approval. Hence in the matter we have to submit the Bank Guarantee for the approval of the same, accordingly the Bank Guarantee submitted during the last approval for an amount of Rs. Nine Lakh Twenty Eight Thousand only (Rs.9,28,000/-) has been renewed up to 31.05.2018

We are herewith enclosing one PMCP plan for your reference. Kindly acknowledge the same. Which is required to enclose along with the five copies of the Scheme of Mining.

STA(Mg-P)
STA (Comm-P)

Received
16/9/13

DEPARTMENT
Indian Bureau of Mines
No. 29, 2nd Stage
Industrial Suburb, Goraguntepalya,
Yeshwanthpur, BANGALORE-560 022.

for Steel Authority of India Limited
Visvesvaraya Iron and Steel Plant

16/9/13

Deputy General Manager (Mines & Raw Mat.)

KANTHARAJ K.
RQP/GOA/130/2009/A

K.T.RAMACHANDRA
RQP/BNG/040/88/A

भद्रावती - 577 301, कर्नाटक, दूरभाष: +91-8282-271512, 271666, फैक्स: +91 8282 271458, +91 80 22227715, ई-मेल: visvesvaraya@sailmail.co.in
Bhadravati 577 301, Karnataka, Phone: +91-8282-271512, 271666, Fax: +91-8282-271458, +91-80-22227715, E-mail: visvesvaraya@sailmail.co.in

मेरी जिन्दगी के कुछ पल है तेरे
There's a little bit of SAIL in everybody's life.

STATE BANK OF MYSORE
BHADRAVATHI BRANCH

Form No:

The Regional Controller of Mines
Indian Bureau of Mines
Bangalore, Karnataka

Dear Sir,

Guarantee No : 40134/11/2012-13

Amount of Guarantee Rs. 9,28,000/-

Guarantee period from 15/03/2013 to 15/03/2018

Last date for lodgment of claim 15/03/2018

This deed of Guarantee executed on 15th Day of March 2013 by State Bank of Mysore, an Associate of State Bank Of India, constituted under the State Bank of India Subsidiary Bank Act 1959 having its Head Office at Kempegowda Road, Bangalore and amongst other places, a Branch at Bhadravathi (Hereinafter referred to as " the Bank ") in favour of the Regional Controller of Mines, Indian Bureau of Mines,Bangalore, Karnataka (hereinafter referred to as " the Beneficiary ") for an amount not exceeding Rs. 9,28,000/- (Rupees Nine lakhs, twenty eight thousand only) at the request of M/s Steel Authority of India Limited, Visvesvaraya Iron & Steel Plant, Bhadravathi (hereinafter referred to as 'the Contractor/s")

This guarantee is issued subject to the condition that the liability of the bank under this guarantee is limited to maximum of Rs. 9,28,000/- (Rupees Nine lakhs, twenty eight thousand only) and the guarantee shall remain in full force up to 15/03/2018 (date of expiry) and cannot be revoked on or before 15/03/2018 (last date of claim) by the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka, in writing.

Subject to as aforesaid
(Main guarantee matter may be typed hereafter)

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

FOR STATE BANK OF MYSORE

Sd/-
Branch Manager
(Bhadravathi Branch)

सत्यमेव जयते

INDIA NON JUDICIAL

Government of Karnataka

e-Stamp

Certificate No.	:	IN-KA55798412536126L
Certificate Issued Date	:	19-Mar-2013 12:29 PM
Account Reference	:	NONACC (FI)/ kakaib08/ BHADRAVATI/ KA-SM
Unique Doc. Reference	:	SUBIN-KAKAK3FCL097948000*4*2554L
Purchased by	:	SAIL VISL BDVT
Description of Document	:	Article 12 Bond
Description	:	AGREEMENT
Consideration Price (Rs.)	:	0 (Zero)
First Party	:	SAIL VISL BDVT
Second Party	:	ROOM IEM BANGALORE
Stamp Duty Paid By	:	SAIL VISL BDVT
Stamp Duty Amount(Rs.)	:	200 (Two Hundred only)

Please write or type below this line

BANK GUARANTEE NO 40134/11/2012-13

BANK GUARANTEE AND CO-ACCEPTANCE BOND

1. Agreement on production of a Bank Guarantee for Rs. 9,28,000/- (Rupees Nine lakhs, twenty eight thousand only) under Rule 23 F of MCDR, 1988

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

2. We, State Bank of Mysore, Bhadravati, Karnataka, at the request of M/s Steel Authority of India Limited – Visvesvaraya Iron and Steel Plant, Bhadravathi (hereinafter referred to as the Lessee) do hereby undertake to pay to the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka, or any other officer authority nominated by the Controller General, Indian Bureau of Mines, an amount not exceeding Rs. 9,28,000/- (Rupees Nine lakhs, twenty eight thousand only) against any loss or damage caused to or suffered or would be caused to or suffered by the Government or towards non-compliance of provisions of Rule 23 A, B and 23E of MCDR, 1988 i.e. *Mine Closure Plan / Progressive Mine Closure Plan* approved in respect of *the mining lease for Limestone over an area of 40.12 Hectares, granted by State Government to M/s Steel Authority of India Limited – Visvesvaraya Iron and Steel Plant, Bhadravathi* situated in Survey No 1, in Bhandigudda village, Bhadravathi Taluk of Shimoga District, Karnataka State, by reason of any breach of the said lessee of any of the terms or conditions contained in the *Mine Closure Plan / Progressive Mine Closure Plan*.

3. We, State Bank of Mysore, Bhadravathi, do hereby undertake to pay the amount due and payable under this guarantee without any demure, *to the authority* merely on a demand from the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka, or any other authorized by the Controller General, Indian Bureau of Mines, stating that the amount claimed is due by way of loss or loss of damage caused to or would be caused to or suffered by the Government by reason of breach by the said lessee of any of the terms or conditions contained in the Mining plan / Mining scheme or by reason of Lessee's failure to perform the said Mine Closure Plan / Progressive Mine Closure Plan any such demand made on the bank under this guarantee. However our liability under this guarantee shall be restricted to an amount not exceeding Rs. 9,28,000/- (Rupees Nine lakhs, twenty eight thousand only).

4. We undertake to pay *to the authority on a demand from* the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka, or any other officer authorized by the Controller General, India Bureau of Mines or Government of India any money so demanded notwithstanding any dispute or disputes raised by the Lessee in any suit or proceeding pending before any Court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be valid discharge of our liability for payment there under and Lessee shall have no claim against us for making such payment.

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

5. We, State Bank of Mysore, Bhadravathi, further agree that the guarantee herein contained shall remain in full force and effect during the period up to the end of the Mining Plan / Scheme of Mining period of five years that would be given by Indian Bureau of Mines, Bangalore, Karnataka, or any other officer authority nominated by the Controller General, Indian Bureau of Mines, an amount not exceeding Rs. 9,28,000/- (Rupees Nine lakhs, twenty eight thousand only) against any loss or damage caused to or suffered or would be caused to or suffered by the Government or towards non-compliance of provisions of Rule 23 A, B and 23E of MCDR, 1988 i.e. *Mine Closure Plan / Progressive Mine Closure Plan* approved in respect of *the mining lease for Limestone over an area of 40.12 Hectares, granted by State Government to M/s Steel Authority of India Limited – Visvesvaraya Iron and Steel Plant, Bhadravathi* situated in Survey No 1, in Bhandigudda village, Bhadravathi Taluk of Shimoga District, Karnataka State, by reason of any breach of the said lessee of any of the terms or conditions contained in the *Mine Closure Plan / Progressive Mine Closure Plan*.

6. We, State Bank of Mysore, Bhadravathi further agree that the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka, or any other officer authorized by the Controller General, Indian Bureau of Mines shall have fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said Agreement or to extend time of performance by the said Lessee from time to time or to postpone for any time or from time to time any powers exercisable by the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka, against the said Lessee and to forbear or enforce any of the terms and conditions relating to the said agreement, we, State Bank of Mysore, Bhadravathi shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Lessee or for any forbearance, act or omission on the part of the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka or any indulgence by the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka, to the said Lessee or any matter or thing whatsoever which under the law relating to sureties would but this provision have effect of so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Lessee.

8. We, State Bank of Mysore, Bhadravathi, lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Regional Controller of Mines, Indian Bureau of Mines, Bangalore, Karnataka in writing.

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

9. Notwithstanding anything contained herein :

a) Our liability under this Bank Guarantee shall not exceed Rs. 9,28,000/- (Rupees Nine lakhs, twenty eight thousand only).

b) The Bank Guarantee shall be Valid upto 15/09/2016.

c) *The period of bank guarantee submitted is valid for the period of the proposals given in the mining plan/scheme of mining / PMCP etc. We are liable to pay the guarantee amount or any part thereof under this bank guarantee and only if served upon us a written claim or demand on or before 15/03/2016.*

10. *If the bank guarantee is to be en-cashed through the court, in that case the Bangalore court will have jurisdiction.*

11. In witness whereof, the Bank through its authorized officer has set its hand and stamp on this 15th day of March 2013.

For STATE BANK OF MYSORE

BRANCH MANAGER
MAIN BRANCH, BHADRAVATHI

For STATE BANK OF MYSORE

Branch Manager
MAIN BRANCH, BHADRAVATHI
(Bhadravathi Branch)