BY REGD POST

GOVERNMENT OF INDIA
MINISTRYT OF MINES
INDIAN BUREAU OF MINES
MCCM CENTRAL ZONE

No. 314(3)/2007-MCCM(CZ)/MP-39 Nagpur, Dated: 11/04/2008

To,

Dr. Sarojini Pradhan,
Telenga Bazar,
Cuttack 753 009 Orissa

Sub. : Approval of Modifications in Approved Mining Plan alongwith Progressive Mine Closure Plan of Kalaparbat Iron ore & Manganese area over an area of 152.927 hectors in Village Raika & Balita of Dr. Sarojini Pradhan in Dist. Keonjhar, Orrisa, submitted under rule 22(6) of MCR, 1960 for grant of mining lease.

Reference:- 1. Your letter No. SP/MF-03/287/07 dated 04.09.2007.
2. This office letter of even no. dated 07.03.2008.
3. Your letter No. SP/MF-04/150/08 dated 07.04.2008.
4. This office letter of even no. dated 10.04.2008.
5. Your letter No. SP/MF-04/150/08 dated 10.04.2008.

Sir,

In exercise of the powers conferred by Clause (b) of Sub-Section (2) of Section 5 of Mines & Minerals (Regulation & Development) Act, 1957 read with Government of India Order No. S.O.445 (E) dated 28.4.1987; I hereby **approve** the modification in the above said mining plan. This approval is subject to the following conditions in addition to the conditions imposed while approving the Mining Plan vide letter no. CAL/KJ/Fe/MP-254 dated 25.03.1993: -

i) This approval of modification in the approved Mining Plan is without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government, State Government or any other authority.

ii) It is clarified that this approval of the modification in the approved Mining 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 Mineral Concession Rules,1960 and any other laws including the Forest (Conservation) Act, 1980, Environment (Protection) Act, 1986 and the rules made thereunder.

iii) It is further clarified that this approval of modification in the approved Mining Plan is subject to the provisions of Forest (Conservation) Act 1980, Forest Conservation Rules 1981 and other relevant statutes, orders and guidelines as may be applicable to the lease area from time to time.

iv) It is further clarified that the approval of modification in the approved Mining Plan is subject to the provisions of the Mines Act 1952 and Rules & Regulations made

6th Floor, 'D' Block, Indira Bhawan, Civil Lines, Nagpur – 440001
Email : com_cz@ibm.mah.nic.in ; Fax : (0712) 2565603 Telephone : (0712) 2565603

thereunder including submission of notice of opening, appointment of manager and other statutory officials.

v) The execution of modification in the approved Mining Plan shall be subject to vacations of prohibitory orders / notices, if any.

vi) The approval of mining operations and associated activities is restricted to the mining lease area only.

vii) If anything is found to be concealed as required by the Mines Act in the content of the mining plan and the proposals for rectification has not been made, the approval shall be deemed to have been withdrawn with immediate effect.

viii) The modification in the approved Mining Plan is approved without prejudice to any other order or direction from the court of competent jurisdiction.

ix) The department does not undertake any responsibility regarding correctness of the boundaries of the lease area shown on the ground with reference to lease map & other plans furnished by the applicant/lessee.

x) Yearly report as require under rule 23E(2) of MCDR'88 setting forth the extent of protection and rehabilitation works carried out as envisaged in the approved progressive mine closure plan and if there is any deviations, reasons thereof shall be submitted before 1st July of every year.

xi) The lessee should submit the financial assurance to the Regional Controller of Mines, Indian Bureau of Mines, Bhubneswar before executing the mining lease deed as per rule 23(F)(3) of Mineral Conservation & Development Rules, 1988.

xii) Your attention is invited to the Supreme Court interim order in W.P.(C) No.202 dated 12-12-96 for compliance. The approval of modification in the approved Mining Plan is, therefore, issued without prejudice to and is subject to the said directions of the Supreme Court as applicable.

xiii) A copy of Environment Impact Assessment-Environment Management Plan (EIA-EMP) as approved by MOEF (Ministry of Environment & Forest) shall be submitted to IBM immediately after approval by MOEF.

xiv) The Environmental Monitoring Cell shall be established by the company. This Environmental Monitoring Cell of the company, shall continue monitoring ambient air quality, dust-fall rate, water quality, soil sample analysis and noise level measurements at various stations established for the purpose both in the core zone and buffer zone as per requirement of Environment Guidelines and keeping in view IBM's circular No. 3/92 & 2/93 season-wise every year or by engaging the services of an Environmental Laboratory approved by MOEF/CPCB. The data so generated shall be maintained in a bound paged register kept for the purpose and the same shall be made available to the inspecting officer, on demand.

Yours faithfully,

Encl : Two copy of approved mining plan

11/4/08

(Ranjan Sahai)
Controller of Mines(CZ)

Copy for information to :

1. Shri Amitav Sahoo, RQP, C/o Shri Praful Nayak, Infront of Orissa Petroleum, Main Road, Barbil, District Keonjhar 758035, Orissa.
2. The Director of Mines Safety, Directorate General of Mines Safety, Chaibasa Region, At & Post Chaibasa, District – Singhbhum West alongwith one copy of approved mining Plan.
3. The Director of Mining, Directorate of Mining & Geology, Government of Orissa, Head of the Department Building, New Capital, Bhubneswar 751 001 Orissa. It is requested to advise the applicant/lessee to submit the financial assurance to the Regional Controller of Mines, Indian Bureau of Mines, Bhubneswar, to comply with the provisions of Rule 23(F)(3) of Mineral Conservation & Development Rules, 1988 before executing the mining lease deed. The lease deed shall be executed only after receiving a confirmation letter from the Regional Controller of Mines, Indian Bureau of Mines, Bhubneswar.

(Ranjan Sahai)
Controller of Mines(CZ)

MINING PLAN

WITH

PROGRESSIVE MINE CLOSURE PLAN

(Prepared under Rule 22(5) MCR 1960)

OF

KALAPARBAT IRON & MANGANESE DEPOSIT OVER AN AREA OF 152.927 HECTS
IN VILLAGE GARIA, BALITA AND THAKURANI R.F.
UNDER CHAMPUA SUB-DIVISION OF KEONJHAR DISTRICT
(ORISSA)

अनुमोदित
APPROVED

Category – A (fully mechanized)
Total Forest area – 145.772 Ha

Applicant – Dr. SAROJINI PRADHAN

PREPARED BY:

Amitav Sahoo
Consulting Geologist
RQP/BBS/011/99/A

खान नियंत्रक (मध्यांचल)
Controller of Mines (Central Zone)
भारतीय खान ब्यूरो
Indian Bureau of Mines

पत्र संख्या 314(3)/ .... एमसीसीएम (मध्य)/एमपी/
एमएस/पीएमसीपी .... दिनांक ....
द्वारा अनुमोदित किया गया।
Approved vide letter No.314(3)/............
MCCM(CZ)/MP/MS/PMCP............dated............

Dr. SAROJINI PRADHAN
Head office: Telenga Bazar, Cuttack – 753009, Orissa. Phone: 0671 – 2618414 / 2624382 (O), Fax: [illegible] (O)
Branch Office: Barbil – 758035, Keonjhar, Orissa. Phone: 06767 – 275314 / 275576 (O), Fax: 0676[illegible] (O)

Ref No. .....

Date:-15/10/2007

CONSENT LETTER FROM APPLICANT

The Mining Plan in respect of our "Kalaparbat Iron and Maganese Leasehold " over an area of 152.927 Hects. in the District of Keonjhar, state of ORISSA has been prepared by SRI AMITAV SAHOO bearing registration no.- RQP/BBS/011/99/A.

I request to the Regional Controller of Mines, Indian Bureau of Mines, Bhubneswar to make further correspondence regarding mining scheme with the said recognized person in his following address.

AMITAV SAHOO
C/O – Praful Nayak
Infront of Orissa Petroleum
Main Road
Barbil, Keonjhar,
ORISSA. PIN – 758035.

APPROVED

I, hereby under take that all the modifications so made in the Mining Plan by the said recognized person be deemed to have been made with my knowledge and consent shall be acceptable to me and binding on me in all respect.

Sing. Of Applicant in full.
For Dr. SAROJINI PRADHAN

(SATYAJIT PRADHAN)
Partner

AMITAV SAHOO
Consulting Geologist.
Regd. No.- RQP/BBS/011/99/A.

CORRESPONDENCE ADDRESS.
C/o Prafula Nayak ,
In front of Orissa petroleum
At. Main Road, P.O.Barbil, Keonjhar

CERTIFICATE

I, Sri AMITAV SAHOO, Geologist duly recognized as qualified person to prepare Mining Plan/Scheme, bearing Registration No. RQP/ BBS/011/99/A, have prepared the Mining Plan of "Kalaparbat Iron & Mine " over an area of 152.927 Hects. under Champua in district Keonjhar of Dr. Sarojini Pradhin, do here by certified that,

The provision of Mineral Conservation and Development Rules 1988 made there under have been observed in the mining scheme and submitted under rule 24 of MCDR-1988 and wherever specific permissions are required the Lessee will approach the INDIAN BUREAU OF MINES (IBM).

The information provided in the Mining Plan is correct to the best of my knowledge.

Date 17.12 2007

(AMITAV SAHOO)
Consulting Geologist
Regd. No.- RQP/BBS/011/99/A

AMITAV SAHOO
Consulting Geologist.
Regd. No.- RQP/BBS/011/99/A.

CORRESPONDENCE ADDRESS.
C/o Prafula Nayak ,
in front of Orissa petroleum
At. Main Road, P.O.Barbil,Keonjhar

CERTIFICATE

This is to certify that the provision of Mines Act 1952, Rules and Regulation made there under have been observed in the Mining Plan submitted under rule 24 of MCDR-1988 and wherever specific permissions are required the Lessee will approach the DIRECTOR GENERAL OF MINES SAFETY (DGMS).

The information furnished in the Mining Plan is correct to the best of my knowledge and belief.

Date 17.12.2007

(AMITAV SAHOO)
Consulting Geologist
Regd. No.- RQP/BBS/011/99/A

CONTENTS

Amitav Sahoo
RQP/BBS/011/99/A

AMITAV SAHOO Consulting Geologist, Regd. No.- RQP/BBS/011/99/A.	Mining Plan of Kalaparbat Iron & Mn Deposit over 152. 927Ha in village Raika and Thkurani R.F. Of Dr. SAROJINI PRADHAN.

LIST OF PLATES.

S.No.	DESCRIPTION	PLATE No.	SCALE
1.	KEY PLAN.	I	1: 50000
2.	LEASE PLAN	II	1:3960
3.	SURFACE PLAN.	III	1:2000
4	GEOLOGICAL PLAN. (INTERPRETED)	IV	1:2000
5	GEOLOGICAL PLAN	IV(A)	1:2000
6	GEOLOGICAL SECTION (INTERPRETED)	IV(B)	1:2000
7	DEVELOPMENT PLAN BLOCK-I (IRON)	V-1 toV-5	1:1000
8	DEVELOPMENT SECTION BLOCK-I (IRON)	V-A-1 to V-5	1:1000
9	DEVELOPMENT PLAN AND SECTION BLOCK-II(IRON)	V-B-1 to V-B-5	1:1000
10	DEVELOPMENT PLAN AND SECTIONS ,BLOCK-III (MANGANESE)	V-C toV-5	1:1000
11	DUMP PLAN AND SECTIONS	VI	1:1000
12	ENVIRONMENT PLAN.	VII	1:5000
13	ENVIRONMENT MANAGEMENT PLAN.	VIII	1:2000
14	CONCEPTUAL PLAN.	IX	1:2000
15	CONCEPTUAL SECTIONS.	IX(A)	1:2000
16	FINANCIAL ASSURANCE	X	1:2000

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RQP/BBS/011/99/A

LIST OF ANNEXURES.

ANNEXURE No.	DESCRIPTION
I	Certificate from lessee(PMCP)
II	Undertaking from lessee(PMCP)
III	Grant letter over 177.453ha in favour of Dr .S pradhan
IV	Grant letter over 171.226 ha
V	Letter from the Govt. regarding the area reduce to 152.927ha
VI	A copy of stage –I approval from MoEF
VII	Photocopy approved letter previous mining plan
VIII	Partnership deed
IX	Flow diagram of crusher plant
X	Photo copy of RQP Certificate

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(PART – A)

CHAPTER:- 1

INTRODUCTION:

The Kalaparbat lease area for Iron and manganese ore of Dr. Sarojini Pradhan, is located in the southwestern belt of the well-known Bonai-Keonjhar Iron-Manganese Belt of the Jamda-Koira Valley, covers an area of 152.927 hectares and forms a part of the Survey of India Toposheet No. 73F/8 under Champua Sub-division of Keonjhar district, Orissa. The mining lease has originally granted in 1990 . The Government of orissa vide letter no VI-MG-177/8rant -5822 dated 24.05 1990. Prior to this Govt. of India has accorded for approval for grant of the lease u/s5(1)of MM(D&R)Act 1957. Subsiquently Govt. of orissa in Dept. of steel and mines vide their letter No III(A)SM –29/98-5781/SM dt8.071999 deducting the granted P.L. area of M/S Kusuleswar mineral over 6.228ha granted the mining lease over 171..226 ha to to Dr.S Pradhan in Kalaparbat for 20years. The lease has not been executed due to want of Environment al clearance from MoEF,GOI.

Previously the area was held under M.L. by M.A.Tullock , hence number of old workings and old trill pit has been found in the area.

Dr. S. Pradhan entered into mining activities in the year 1956 and acquired enough experience and expertise in this field and developed adequate infrastructure for systematic and planned exploitation of mineral wealth for the benefit of the nation.

The present project is envisaged to cater to the enhanced Iron ore requirement of sponge iron, pig iron and iron ore fines. The project, while going into operation, will generate employment potential for engineers, technicians, skilled and unskilled workforce.

The details of the leases granted /executed in favour of the applicant in the state is given below

Sl. No	Status of the Lessee	Name of the mine	Area in ha
1	Executed and Operated	Balita Iron ore mine	34.75
2	Executed and Operated	Inganijharan Iron and Manganese mines Mine	18.70
3	Executed and Operated	Baitarani Iron Ore Mine	65.397
4	Granted	Kalaparbat Iron & Manganese Mine	152.927
5	Granted	Sidhamath Iron & Manganese Mines	94.259

APPROVED

11/4/08

खान नियंत्रक (मध्यांचल)
Controller of Mines (Central Zone)
भारतीय खान ब्यूरो
Indian Bureau of Mines

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RQP/BBS/011/99/A

Reasons for preparation of Mining Plan

The Mining Plan of Kalaparbat Iron & Manganese Mines of Dr. Sarojini Pradhan covering an area of 177.453 Hects or 438.50 acres in Thakurani R.F. Village Raika of Keonjhar district of Orissa was approved by the Regional Controller of Mine, Indian Bureau of Mines, Calcutta vide letter No. CAL/KJ/Fe/M.P-254 dt-25/02/1993. This Mining Plan covers amongst other details, the year wise production and development programme of the mines for the first five years, and Conceptual Plan at the end of the lease period.

MoEf , GOI granted stage –I forest clearance over 177.453 ha with 13 condition . In condition no.4 4 it was stated for survey and demarcation of the M.L. area in the project cost .

Dy. Director of Mines, Joda took up the survey of the said area on 24.4.2006 and the area came to 152.927 ha. in steed of 177.453 ha. and approved by Director of mines ,Orissa

Due to change in area a new mining plan has been prepared under Rule 22(6) of MCR1960 and submitted to Indian Bureau of Mines for approval which needs to be presented before the Environmental Expert committee MoEF , GOI .

Amitav Sahoo
RQP/BBS/011/99/A

1.0 GENERAL:

1.1 Name and Address of the Applicant:

M/s Dr. Sarojini Pradhan.
Mines Owner,
Telenga Bazar,
Cuttack-753009, ORISSA.
Phone No- 0671-225613 (R) 225614(O)
Partner : Shri Satyajit Pradhan
Address : K-1, Kalpana Squaer ,Bhubaneswar
Telephone : 0674- 2311164
Fax : 0674-2310804

1.2 Status of the Applicant:

The applicant is a partnership firm (Annexure-II). All the partners of the firm are Indian Nationals and engaged in mining activity as well as mineral based industries since 1956. The name and address of the Partners are listed below:-

Sl. No.	Name.	Occupation.	Address.
(1).	Mr. Sabyasachi Pradhan	Business	Telenga Bazar, Cuttack-753009 Phone-0671-256113
(2).	Mr. Sibananda Pradhan	-do-	-do-
(3).	Mr. Sunandan Pradhan	-do-	-do-
(4).	Mr. Satyajit Pradhan	-do-	-do-

1.3 Mineral (s) which are occurring in the area and which the applicant intends to mine:

The applicant intends to mine Iron ore and Manganese ore .

Amitav Sahoo
RQP/BBS/011/99/A

1.4 Period for which the mining lease is required:

The mining lease for Iron ore over an extent of 152.927 hectares is required to be renewed for a period of 20 years.

1.5 Name, Address and Registration number of the RQP preparing Mining Plan:

Name	:	Amitav Sahoo
Addres	:	C/o Prafula Nayak Infront of Orissa Petroleum Main road Barbil, Keonjhar. 758035.
Telephone	:	Mobile 9437263683
e-mail	:	amitav_sahoobbl@yahoo co. in
Reg. No.	:	RQP/BBS/011/99/A.
Date of Registration	:	23/02/1999
Date of Renewal	:	22/02/2001
Valid up to	:	22/02/2011

1.6 Name and Address of the Prospecting Agency:

Lessee has engaged their own team of Geologist and Surveyors and has generated a lot of information on the extent of the ore deposits. The RQP has prepared the topographical cum geological plan on 1:2000 scale as a part of the preparation of this mining plan. Address of the lessee is as below:-

Dr. Sarojini Pradhan.

Mining Lessee.

Telenga Bazar,

Cuttack-753009

APPROVED

Amitav Sahoo
RQP/BBS/011/99/A

CHAPTER:- 2

2.0 LOCATION AND ASSECCIBLITY:

2.1 Details of the Area (With Location Map):

State	:	Orissa.
District	:	Keonjhar.
Sub-divison	:	Champua.
Village	:	village Raika and Thakurani R.F.
Ref. Toposheet No.		73F/8.
Latitude	:	22^0 03'37" to 22^0 04' 36" N
Longitude	:	85^0 25' 21" to 85^0 26'19 " E.
Lease Area	:	**152.927** hects.

2.2 Infrastructure:

Adequate infrastructure facilities are already available near the area, being a part of the active mining region.

The area is easily accessible by an all-weather, well-maintained motor able morrom road which branches off from Panikoili , Rajamund NH 215 at Kalapahada near Joda township

The nearest railway siding is 8 Km to the southwest at Banspani on East Coast Railway.

Joda which is 3-4 km due south, having well developed township with all the basic amenities like well-equipped hospitals run by TISCO as well as CESS, Schools, College, Banks, P&T Office, DDM Office, Police Station, Phone facilities, Entertainment centers, Market, etc.

Electricity is available through the Joda grid of (NESCO) for both Industrial as well as Domestic purposes.

Telephone facility may available in the mine site by WLL system.

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RQP/BBS/011/99/A

Paradeep port is situated at distance 310 km from Joad , where both bulk and container handling available.

Water from Baitarani and its tributary - Kundra Nala -- is being supplied to Joda Township as protected drinking water supply project. The lease area around Raika , however, has to depend on mostly deep well and local perennial streams for the water requirement.

The area being a part of the well –known mining belt for the last several decades and as the local people are traditionally engaged in mining work, there is no dearth of skilled and unskilled work force.

2.3 General location and Vicinity map:

Mining lease area has been plotted in a cadastral map on a scale of 1:1000 and in the location plan on a scale of 1:50,000 showing all surrounding features like existing and proposed access route, village site etc.**(Ref. Plate:-I & II)**

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RQP/BBS/011/99/A

CHAPTER:- 3

3.0 GEOLOGY AND RESERVE:

3.1 Topography, Drainage, General geology & Local / Mine geology of the mineral deposit:

3.1.1 Topography:

Forming a part of the dissected plateau that constitutes the entire Bonai – Keonjhar belt, the lease under consideration with the buffer zone is characterized by a highly rugged terrain covered with a thick canopy of forest. The topography of the lease area is dominated by a kilometer long and 400m wide Nw –SE trending ridge with a narrow 300m long flat top The eastern and north eastern con sequent slopes are relatively steeper than the western and south western consequent slopes. The highest point of 714 m peak of Kalaparbat pahara lies to the south and just out side the lease hold boundary.

The central part of the lease is characterized by relatively flat or gently undulating topography Similarly in the north western corner of the lease area the topography is marked by gentle easterly slopes.

The maximum relief in the area is about 135 m the heist point is 667m attained by the peak of the NW-SE trending major ridges and the lowest point of about 525 m is reached in the north central and southeastern part parts closed to the lease boundaries.

3.1.2 Drainage:

The NW-SE trending hill range that dominate s , the western part of the buffer zone constitute a water shed dividing two main drainage basin namely , the Karo river basin to the west and the Baitarani river basin to the east An important tributary of the buffer zone which has broad dendritic pattern is controlled by this tributary in the ester part In the western part also first order dendritic type controlled by river Karo whish flows from south to north afew kilometer west of the western zone of the area. The Kunduru and the Mahadev nala in the east are perennial .

Amitav Sahoo
RQP/BBS/011/99/A

3.1.3 Landuse:

The 95% area under total lease falls within the Thakurani Reserved Forest which is categorized as 'fairly dense mixed jungle mainly sal'.

3.1.4 Climate:

The area like other parts of the state, experiences tropical climate with hot summer between March to June and cold winter between November to February. The maximum and minimum temperature recorded is 43.50^0 c and 9.30^0 c respectively.

The monsoon sets in late June and extends up to the end of August. Despite considerable rainfall this region experiences large variation in humidity. The mean relative humidity values for day and night during these months of the year are ranging from 59.2% to 76.3%.

Wind speeds vary between 2.7 Km/hr. and 12.7 Km/hr. in February and May months respectively during day time and the values for the night correspondingly are 1.1 Km/hr and 3.3 Km/hr. The directions vary between south and northwest during day and between southwest and south during night for the same months.

3.1.5 Regional Geology:

The area in consideration forms a small part of the well-known NNE-SSW trending Iron-Manganese belt of north Orissa and south Singhbhum of Bihar (Fig.- 1).

In Orissa this belt, known as the Jamda- Koira valley of the Bonai- Keonjhar belt, encompassing parts of Sundargarh (Bonai Sub-division) and Keonjhar (Barbil Sub-divison) districts constitutes an important source of high-grade Iron ore and low-phosphorous, low-grade Manganese ore.

Even since Jones (1934) brought out the first Memoir on the geology and Iron ore deposits of this region, considerable attention has been brought to bear on various aspects (Dunn, 1940; Prasada Roa et al, 1964; Murty and Acharya, 1975 etc.), Iron ore deposits (Sen, 1976 and 1982), Iron-formation (Subramanyam and Murty, 1975; Spencer and Percival, 1952; Rai and Paul, 1990; Majumder, 1990 etc.) and Mn- ores

(Spencer, 1948; Sen, 1951; Prasada Roa et al, 1956; Engineer, 1956; Murty and Ghosh, 1971 etc.).

The belt is underlain by little to less metamorphosed sequence of volcanic-sedimentary rocks of Precambrian age included originally in the Iron-Ore-Series by

Amitav Sahoo
RQP/BBS/011/99/A

Jones (1934). The stratigraphy of the belt worked out recently by Murty and Acharya (1975) is as follows:-

KOLHAN GROUP : Breccia-conglomerate, Sandstone and minor Limestone.

---------- Unconformity ----------

IRON ORE GROUP.

Mixed Facies Formation.
Basic lava, Tuff, Chert, BIF, Mn-shale, Sandy / Silty shale, Clayey shale, Iron and Mn-ore etc.

Banded Shale Formation.
Rhythmically bended black & white silty shale grading to black shale towards bottom and altering to buff, brown, orange, pink, purple, and red colours.

Banded Iron Formation.
Protore for the major Iron ore deposits, interceded green & white charts with jet black shale at the top.

Lower Shale Formation.
Volcaniclastics, Tuff, Black shale, Magnetite-shale etc.

Volcanic Formation.

Mafic lavas interceded with quartzite towards bottom.

Basal Quartzite-Sandstone.
Coarse gritty current bedded quartzite with lenses of quartz-pebble conglomerate.

---------- Unconformity ----------

Singhbhum Granite with greenstone belt relics.

The rocks of the belt are folded into a major, low, north-plunging synclinorium slightly overturned to the east (Fig.-1). The core region of this synclinorium is occupied by the Iron and Manganese bearing sequence of the Mixed Facies Formation. The rim is made up of the BIF and the supergene iron ore deposits of Gua, Bolani, Kiriburu, Kalta, Barsuan, Khandadhar and Malangtoli etc.

Amitav Sahoo
RQP/BBS/011/99/A

Cross folding about ENE-WSW trending axes has resulted in the development of dome and basin structures, a consequence of which is the preservation of the Mixed Facies Formation within the structural basins and removal of the same by erosion in the structural domes which expose the lower Banded Shale Formation. Furthermore, intense faulting and thrusting about NNW-SSE trend in the eastern part have been responsible for the elimination of the major BIF zone with supergene iron ore bodies between Malangtoli in the south and Murgabera in the north. Along this stretch the younger MFF has come in juxtaposition with the older volcanic and Basal Quartzite Formations. It is for this reason that the high grade, hard, massive syngenetic type iron ore bodies of the Mahaparbat, Gurda, Palsa, Joruri, Khandband, Banspani, Bätarani, Joda, Kalaparbat, Murga areas associated with clayey shale, Fe-shale and at places Mn-ore of MFF occur in close proximity to the volcanic and quartzite all along this N-S zone, immediately to the west of Baitarani River.

The rocks have been extensively lateritised to various degrees leading to enrichment of manganese as well as iron at places to constitute ore deposits. Lateritisation is also responsible for slight degradation of ores, especially in the upper parts of the profile.

3.1.6 Local Geology / Geology of the Leasehold:

The lease hold area is underlain by the different components of litho units of mixed facies formation. Viz. clayey and ferruginous shale , banded iron formation (BHJ/BHQ) and altered tuff In the north central ,northwestern and southern parts of the lease red ,orange purple silty shale of the banded shale formation are exposed. , while thin zones of loose laterite are ubiquitous, laterite and conga are present in three places .Hard massive and finely laminated or thin bedded hematite bodies also constitute important lithounits of the area .

3.1.6.1 Rock type:

The leasehold area is underlain by the different component lithounits of the Mixed Facies Formation viz. ferruginous shale, Mudstone (altered tuff), BHJ (Bended Hematite Jasper), Chart and Chart breccia. The eastern part of the area is underlain by the mudstone (altered tuff) while the BHJ occupies a large area in the western part. Between these two units the area is underlain by the ferruginous shale and Chert /Chart breccia (red-ferruginous, gray and white at places manganiferous and brecciated). The ferruginous shale is made up of thinly bedded and finely laminated iron-rich and clay-rich shale interbedded with lenses and bends of hematite and manganese as well as ferruginous and grey & white (at places brecciated) chart. In the western part this unit is

Amitav Sahoo
RQP/BBS/011/99/A

essentially iron rich while in the eastern part both hematite and manganese bands occur in Fe-shale.

The BIF and Fe-shale units of MFF are overlain, in the western part, by a coarse conglomerate made up of pebbles and cobbles of BHJ, jasper, quartz and high-grade hematite. The pebbles are angular to well - rounded. The conglomerate is interbedded with ferruginous and clayey as well as sandy shale. The total thickness of this unit, which may belong to the Kolhan Group, is about 2m or so in this area.

Surfacial and second deposits like laterite and conga occur extensively in the western part of the lease. The conga, in particular, is very thick exceeding 2 to 3m and occurs as an escarpment of 80m lengths. Soil cover is very thin not exceeding 0.25m that too with impersistent distribution. Float iron ore occurs within the top 20cm in the central part of the leasehold. It is present on the Fe-shale unit.

Hematite :-The large portion of common ore is Hematite and these are mostly in, oxide form . The ore mineral do not occur in pure form ,containing varying amounts of silica alumina , phosphorous , sulphur among others The chemical composition is Fe^2O^3.

Laterite:- Some area in the belt are covered by laterite ranging from thickness 2to 6 meter The lateries occurs in almost all the rock formation present in the area. All the type massive, cavernous ,vermicular and pisolitic laterites noticed. The pisolitic often ferruginous .The loose late rite known as Morum occurs as fracture filling within late rites and is therefore ,inferred generation.

Iron ore occurs as thin bends, beds, lenses within the Fe-shale and BHJ, which are co-folded with the enclosing shale implying a pre-deformational origin. It is, therefore, likely that iron ore is syngenatic type. The grade of the iron ore in this mine is 58%-65%. And the Fe % of BHQ/BHJ varies from 35%Fe to 48%Fe

3.1.6.2 Type, Distribution and Control of Iron Mineralisation :

Iron ore occurs as insitu bodies as well as important float zones. Two major insitu labeled Insitu –I and Insitu body II are shown on Plate III along arbitrarily demarcated float ore zone. Marked FOZ-I through FOZ-IV

Insitu ore Bodies

The insitu ore body No-I , most important from the point of view. of quality and quantity. is exposed for over 500m strike length on top of the main NW-SE trending ridge with the best massive outcrop occurring in the the right on the peak 667m . If the small outcrop of similar iron ore occurring at the southeastern end of the same ridge were to be considered continuous with the main ore body at depth the total

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RQP/BBS/011/99/A

strike length of he IOB-I is likely to exceed 600m The exposed thickness ,as seen at the top of the ridge and down the north east slope is approximately 25m

The IOB-I is completely devoid of any overburden save for one to one and half meter thick laterite cover . Banded Iron formation on the south western side and ferruginous shale composed of inter bands of thin hematite and buff clay shale on the north eastern slopes are closely associated lithologies with iron ore .

Iron Ore occurs as thin, high-grade bends, which are impersistent and lenticular along strikes, in the Fe-shale and BHJ units mainly in the western part. The Kolhan Conglomerate occurs in the western part along the western boundary. Examination of the existing pits and trenches that occur in the western part around the BHJ outcrop the iron ore occurs as thin bands within Fe-shale and massive / thick bands hardly exist. The target area for iron ore, therefore, is determined by the presence of Fe-shale unit whose distribution is in space. It is also likely the Fe-shale occurs below the laterite,

conga and the pink and grey shale. Thus a large area within the leasehold is apparently underlain by the Fe-shale, which has potential iron mineralisation.

3.2 Details of Exploration:

3.2.1 Exploration Already Carried out in the Area:

The lease area was surveyed and demarcated by the Mines and Geology Department, Government of Orissa and a plan prepared on 1:3960 (16 inches to a mile) scale. (Ref. Plate:-II)

Jones (1934) was the first to carry out a broad survey of the Jamda- Koira valley. The area was also explored by the various Government agencies including GSI.

Lessee has engaged their own team of Geologist and Surveyors for last more then one year and has generated lot of information on the extent of the ore deposits. Previously the area was held under M.L. by M.A.Tullock . hence some old workings and old trill pit has been found in the area. There has been 13no of trial pits is consider to gather information pertaining to the sub- surface parameters of the ore bodies. .The size of the old trial pit are 2 m x 2 m .The out crop pattern of different litho unit and the ore zone boundary thus delineated have been utilized in conjunction with the third dimensional data obtained from the pits and working quarries of adjacent leases. In the eastern boundary is common with Balita iron mines of the same lessee So the proved depth of the working quarries will be taken as proved depth .One old quarry has exist in the manganese ore zone. The size of the quarry is 160 m x 30m

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3.2.2 Future Exploration to be carried out:

In order to define the ore zone boundary very clearly as also to obtain more information in the virgin parts of the area on different parameters of the ore zone like thickness, grade, recovery etc. to have more comprehensive idea about ore to achieve higher reliability in the estimated resource some more bore hole has been proposed in the next plan period., the next drilling program for 1st and 2nd year will be proposed within mineralized zone up area and from 1st year to 2nd year the total drilling will be involved 1320 in page 12 m The average depth 40 mt. from the surface and the locations are indicated on Plate No:- IV.

3.3 Priority and Phasing of Exploration Programme:

The drilling quantum has been ensued for the first five-year and details of year wise drilling programme is as follows:-

TABLE:-1

Sl. No.	Type of ore	Year	No. of Bore holes.	Type of bore hole	Grid interval	Depth f Bore hole in mtr
1	Iron ore	1st	16	Rc/core	100mx100m	Bore will be drilled up o the depth mineralisation
2		2nd	17	do	do	do
3		Conceptual year	15	do		do
4	Manganese ore	1st	3	DTH	50m x 50m	do
5		2nd	3	do		
6		Conceptual year	15	do	do	do

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3.3 Geological Reserve & Grade:

Method of Reserve Estimation:

The Iron Ore deposit of the area may be classified as complex to intricate in the sense that the ore bodies are highly folded and dislocated, irregular and podiform in shape and unpredictable in so far as their continuity is concerned. Further, they are intercalated frequently with ferruginous shale making the recovery from place to place variable and unpredictable.

The above-mentioned aspect coupled with the fact that high relief exists in the area makes the cross-sectional method suitable for the reserve estimation. The volume of ore zone is obtained by calculating the sectional area in each of the cross-section and multiplying the same with length of influence of each section, which is same as the interval between two sections. The product of bulk density and the volume of ore zone give the tonnage of In situ geological reserve. The bulk density of hard massive/ float iron ore is taken as 3.0 Basing on the previous recovery of the ore has been taken 80% for in situ iron ore and 50 % for float ore. of the total ore volume.

Similarly in the manganese ore zone the recovery has been taken 10% and the bulk density is 2.0. The calculation is same as the iron ore reserve calculation.

3.4 TYPE OF RESERVES (Iron Ore):

3.4.1. Prove Reserve:

In section AA, BB', CC', DD', EE' FF' up to the proved depth of the quarry adjoining to the lease boundary has been taken under proved category. Length of influence of the ore body has been taken up to well exposed the old working pits on both sides. Cross-sectional area of the ore body, multiplied by strike length of influence, multiplies by bulk density gives proved reserve.

34.2. Probable Reserve:

The probable reserve is estimated considering ten meter in depth and 50m lateral influences from the proved reserve. And method of estimation is same as proved reserve.

TYPE OF RESERVES (Manganese ore):

3.4.1. Prove Reserve:

In section AA, BB', CC', DD', EE' FF' up to the proved depth of the old quarry i.e. 5 m from surface has been taken under proved category.

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Length of influence of the ore body has been taken up to well exposed the old working pits on both sides. Cross-sectional area of the ore body, multiplied by strike length of influence, multiplies by bulk density recovery factor gives proved reserve.

34.2. Probable Reserve:

The probable reserve is estimated considering 5 meter in depth and 50m lateral influences from the proved reserve. And method of estimation is same as proved reserve.

3.4..3 Summary of Geological Reserve:

The Geological reserve is summarized from the Table:-2 & 4 enclosed and as detailed below:-

Type of Reserve	Float ore zone	Insitu Ore body-I	Insitu Ore body-II	Total Iron ore	Manganese ore
Proved	631896	1747872	171024	2550792	125060
Probable	166538	1646856	337536	2150930	123140
Total	798434	3394728	508560	4701722	248200

3.4 . 5. 7 Mineable Reserve:

The total estimated geological reserve after allowing the losses of ore under benches left at the ultimate pit limit for safety purposes and stability of slope, in course of mining and handling of ore for Iron Ore.. Hence the mineable reserve worked out as:-

Type of Reserve	Float ore zone	Insitu Ore body-I	Insitu Ore body-II	Total Iron Ore	Manganese ore
Proved	600294	1508568	153648	2262510	101232
Probable	450220	1481904	298658	2230782	99720
Total	1050514	2990472	452306	4493292	200952

3.4.5.1 Grade of the ore:

Bulk of the Iron ore in the estimated reserve is high grade with the Fe content ranging from 60 to 65%.A chemical analysis report has been annexed Annexure - IX

Keeping in view of the market and requirement of the buyer a cut off limit of 58% Fe has been consider for Iron ore.

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34.5.2 Sub-grade ore:

Based on the experience of last few decades and data collected from the different mines and the existing pits. The following figures regarding sub-grade ore has arrived:-

	For Iron ore	Manganese ore
Marketable grade ore	+58 % Fe	+26%Mn
Sub-grade ore	-58 to +55 % Fe	-26%to +20%Mn
Threshold value	55 % Fe	20%Mn

3.4 .5.5 Cut-off grade:

Keeping in view of the market and requirement of the buyer a cut off limit of 58% Fe has been consider for Iron ore. Similarly the cut of grade for manganese is 26%Mn .

Summary of the Iron Ore Reserves with UNFC CODE

UNFC Code	Quantityin MT
222	23,89,326
332	22,55,500
333	2,47,740

Summary of the Manganese ore Reserves with UNFC CODE

UNFC Code	Quantityin MT
222	1,01,232
332	99,720
333	23,420

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Table no -2
Geological reserve Float Ore zone

Ore Zone	Reserve category	Area Sq. m	Average thickness	Volume	Recovery(50%)	Ore in MT Bulk density 3.0
FOZ-I	Proved	84142	2	168284	84142	252426
FOZ-II		41690	2	83380	41690	125070
FOZ-III		10783	2	21566	10783	32349
FOZ-IV		74017	2	148034	74017	222051
						631896
FOZ-I	Probable	84142	1.5	126213	63106.5	189319.5
FOZ-II		41690	1.5	62535	31267.5	93802.5
FOZ-III		10783	1.5	16174.5	8087.25	24261.75.
FOZ-IV		74017	1.5	111025.5	55512.75	166538.25
						473922

Table No.-3

Geological Reserve Insitu Ore Body-I

Sectional Line	Reserve category	Area of cross section	Length of influence	Volume	Recovery(80%)	Ore in MT Bulk density 3.0
DD'	Proved	1839	100	183900	147120	441360
EE'		2738	100	273800	219040	657120
FF'		436	100	43600	34880	104640
GG'		780	100	78000	62400	187200
HH'		1200	100	120000	96000	288000
II'		414	70	28980	23184	69552
						17,47,872
DD'	Probable	1280	100	128000	102400	307200
EE'		1328	100	132800	81600	318720
FF'		992	100	99200	136800	238080
GG'		1404	100	140400	163200	336960
HH'		1580	100	158000	177120	379200
II'		397	70	27790	22232	66696
						16,46,856

Table No-4

Geological Reserve Insitu Ore Body -II

Sectional Line	Reserve category	Area of cross section	Length of influence	Volume	Recovery(80%)	Ore in MT Bulk density 3.0
JJ'	Proved	322	80	25760	20608	61824
KK'		455	100	45500	36400	109200
						171024
JJ'	Probable	598	80	47840	38272	114816
KK'		928	100	92800	74240	222720
						337536

AMITAV SAHOO Consulting Geologist. Regd. No.- RQP/BBS/011/99/A.	Mining Plan of Kalaparbat Iron & Mn Deposit over 152. 927Ha in village Raika and Thkurani R.F. Of Dr. SAROJINI PRADHAN

Geological Reserve Manganese ore

Sectional line	Reserve category	Cross sectional area	L.I.	Volume	Recovery (10%)	Ore in ton Bulk density2.0
AA'	Proved	248	100	24800	2480	4960
BB'		232	100	23200	2320	4640
DD'		811	100	81100	8110	16220
EE'		1392	100	139200	13920	27840
FF'		1872	100	187200	18720	37440
GG'		1698	100	169800	16980	33960
				625300	**62530**	**125060**
AA'	Probable	240	100	24000	2400	4800
BB'		220	100	22000	2200	4400
DD'		805	100	80500	8050	16100
EE'		1380	100	138000	13800	27600
FF'		1642	100	184200	18420	36840
GG'		1670	100	167000	16700	33400
				448700	**61570**	**123140**

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Mineable Reserve (Float ore zone)

Ore Zone	Reserve category	Area sq.m.	Average thicness	Volume	Recovery(50%)	Ore in MT. Bulk density 3.0
FOZ-I	Proved	79934	2	159868	79934	239802
FOZ-II		39605	2	79210	39605	118815
FOZ-III		10243	2	20486	10243	30729
FOZ-IV		70316	2	140632	70316	210948
				400196	**200098**	**600294**
FOZ-I	Probable	79934	1.5	**119901**	59950.5	179851.5
FOZ-II		39605	1.5	59407.5	29703.75	89111.25
FOZ-III		10243	1.5	15364.5	7682.25	23046.75
FOZ-IV		70316	1.5	105474	52737	158211
				300147	**150073.5**	**450220.5**

Mineable Reserve (Insitu Ore body-I)

sectional line	Reserve Category	Area of Cross section	Length of influence	Volume	Recovery	Ore in MT
DD'	Proved	1655	100	165500	132400	397200
EE'		2446	100	244600	195680	587040
FF'		404	100	40400	32320	96960
GG'		745	100	74500	59600	178800
HH		755	100	75500	60400	181200
II'		401	70	28070	22456	67368
						15,08,568
DD'	Probable	1152	100	115200	92160	276480
EE'		1195	100	119500	95600	286800
FF'		892	100	89200	71360	214080
GG'		1263	100	126300	101040	303120
HH		1422	100	142200	113760	341280
II'		358	70	25060	20048	60144
						14,81,904

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Mineable Reserve(Insuitu Ore Body-II)

sectional line	Reserve Category	Area of Cross section	Length of influence	Volume	Recovery	Ore in MT
JJ'	Proved	322	80	25760	20608	61824
KK'		455	100	45500	36400	109200
						171024
JJ'	Probable	598	80	47840	38272	114816
KK'		905	100	90500	72400	217200
						332016

Mineable Reserve (Manganese ore)

Sectional line	Reserve category	Cross sectional area	L.I.	Volume	Recovery	Ore in tonn
AA'	Proved	223	100	22300	2007	4014
BB'		208	100	20800	1872	3744
DD'		729	100	72900	6561	13122
EE'		1252	100	125200	11268	22536
FF'		1684	100	168400	15156	30312
GG'		1528	100	152800	13752	27504
				562400	**50616**	**101232**
AA'	Probable	216	100	21600	1944	3888
BB'		198	100	19800	1782	3564
DD'		724	100	72400	6516	13032
EE'		1242	100	124200	11178	22356
FF'		1657	100	165700	14913	29826
GG'		1503	100	150300	13527	27054
				554000	**36333**	**99720**

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CHAPTER:- 4

4.0 MINING:

4.1 Proposed Method of Mining:-

Traditional open cast method will be followed in as much as the deposits are all shallow, more or less flat lying or with a slightly irregular bottom configuration of the ore body / zone and as such do not require underground working. The benches in the relatively less hard manganese ore shall have an average height of 6 m and a slope of 30^0. The working will be done by semi-mechanised method, to remove the overburden the heavy earth moving equipment will be deployed and ore will de extracted by manually.

The production of Iron ore is proposed to be increase up to 2.00 million tones during Fifth year of operation due to favorable market conditions. For this purpose, Insitu ore body –I and II, along with the Float zone will be mined mechanically by deploying the necessary heavy earth moving equipments i.e. shovel, dumpers, drilling machine etc. Drilling will be carried out by compressed air drill. Blasting will be done by using conventional explosives, slurry explosives and ANFO. The blasted ROM will be crushed and screened and the finished lumpy (sized) ore will be dispatched to customers by truck and rail transport system.

Some old working has found in the lease area of M..A. Tullock"s time . A manganese quarry of 160m X 50m size is in the northwestern side of the lease area. There are also four no. of old working in the float workings found in the north western part of the lease hold. The sizes of the pits 128m x45m,118mx27m,47mx19m and90m x20m

4.1.1 Design parameters

For the working benches of In-situ ore Bodies – I & II in all the development years, the height of the benches will be maintained at 6 m height and 10 m width to facilitate safe mining operations. Drilling pattern will be 3.5 m x 4 m (burden x spacing), shovels of 2.5 to 3.1 m3 capacity along with 25T dumpers will be used. Drilling of 32 mm, 100 / 150 mm dia will be utilised. A mobile Crusher plant will set up which will produce 3 types of products namely BF lumps(-30 +18mm), Sponge grade lumps (-18 +5mm) and fines (-5mm).

The year-wise development of quarries including their extent, recovery, quantity generation of waste, grade etc. are shown in Table:-6 & 7. The development plans are also shown in two dimensions on the 1:1000 scale and illustrated in cross-sections showing the progressive change in topography consequent upon mining (Ref. Plate-VI & VII).

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Haul Road:

Haul road will be developed for the deposits. The road extends to all activities in a gradient of 1:16 and less. So, in some places cutting and filling of debris is required. Loaded truck and rainwater often damage the road. Therefore, a regular maintenance is required through out the plan period.

Site services

The infrastructure like rest shelter ,blasting shed ,drinking water first aid facility will be facilitate in the mine

Dumping:

The OB and waste generated during the first plan period will be dumped in the ear-marked area for dumping by terracing method. The dump materials will be compact by means of dozer. The boulder wall will be made around the dump to arrest the rolled down materials while dumping. Further outside the boulder wall a garland drain will be made to check the wash off materials during rainy season. The dump will also be stabled by planting tress and grasses on the terrace, slope and on the dump sides.

Dump plan with sections have been shown in Plate:-VI and also been coloured to represent year wise dumping configuration, where dump sections have been prepared along the direction of advancement of dump as well as across the dump.(Ref. Table:-7A & 7B).

4.12 Quantum of Development and Production for first Five year

Keeping in view the market demand and resource availability the quantum of production is proposed to be in IOB-I, IOB-II, Float ore zone and in manganese quarry .The target for the next five year plan period obtained as follows:-

Production target for Five Years.

Year	Vol. Of Excavation (m^3)	Iron Ore (M.T.)	Mn ore	Sub grade Ore(iron) (M.T.)	Sub grade Ore(Mn) (M.T.)	O.B. / Waste (m^3)
1st	56926	1,40,931	2587	7461	862	21613
2nd	108130	2,68,422	3075	13992	1025	30857
3rd	212300	5,30,532	3475	23502	1158	49252
4th	327700	8,59,980	3930	30780	1310	113480
5th	814485	19,99,989	4998	102079	1666	175166
Total	**1519541**	**37,99,854**	**18,065**	**1,77,814**	**6021**	**3,90,318**

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Development in the first year :-

During first year, the float ore as well as Insitu ore in I.O.B.-I and II will be mined in benches starting from RL 662, 656 (I.O.B.-I), 605 (I.O.B.-II), and RL 575 (float). Height of the benches will be kept at 6 meters. And mining of Manganese ore will be started at the R.L.563. Salient features of the development during first year are given in Table :-5(A-1 and A-2).

TABLE :– 5(A-1)

Name of Quarry	Year wise direction of advancement	Working depth (in meter)	Dimension of quarry (L XW)	Striping ratio
IOB-I	.Start NE	11	109x 126	1 : 0.06
IOB-II	Start SE	7	85X 70	1 : 0.42
Float ore zone -I		5	40X35	1 : 0.16
Manganese Quarry	Start SE	5	40X30	1 : 2.83

TABLE :– 5(A-2)

DEVELOPMENT PROGRAMME FOR FIRST YEAR (IN TONNE)
(Ref. Plate:-V(A) for Development plan and V²(A) for Sections)

SL. NO	DESCRIPTION	FLOAT ZONE-I	I.O.B.-I	I.O.B.-II	Total	Mn - Ore
1.	Working Benches (R. L.)		662,656	605		563-569
2.	Total Quantity of Excavation(Cum)	7185	41500	8240	56925	8625
3.	Overburden (Cum)	-	-	10560	10560	-
4.	Waste (Cum)	3592	6225	1236	11053	7331
5.	Sub-Grade Ore (Ton)	--	6225	1236	7461	
6.	Ore. (Ton)	21,555	99,600	19776	140931	2587

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Development in Second Year :-

The float ore will be mined at 580 meter RL and Insitu ore will be mined at 650 meter & 656, &662 meter RLs by top slicing method in I.O.B.-I. Production from I.O.B.- II will start from this year at 599 meter R.L. And for the Mn–ore the development and production will de continue at the same R.L. i.e. 564 meter in addition with two new benches having R.L. 546 & 550 meter. Salient features of the Development during second year are given in Table :-5(B-1,B-2).

TABLE :– 5(B-1)

Name of Quarry	Year wise direction of advancement	Working depth (in meter)	Dimension of quarry (L XW)	Stripping ratio
IOB-I		17	368 x 175	1 : 0.06
IOB-II	Both east and west	7	135 x 95	1 : 0.34
Float ore zone -I		5	96 x 26	1 : 0.16
Manganese Quarry	SE	5	70 x 55	1 : 2.14

TABLE :– 5(B-2)

DEVELOPMENT PROGRAMME FOR SECOND YEAR (IN TONNE)
(Ref. Plate:-V(B) for Development plan and V'(B) for Sections)

SL. NO	DESCRIPTION	FLOAT ZONE-I	I.O.B.-I	I.O.B.-II	Total	Mn - Ore
1.	Working Benches (R. L.)		656,662	605.599		564-570
2.	Total Quantity of Excavation(Cum)	14850	83600	9680	108130	10250
3.	Overburden (Cum)	-	-	9440	9440	-
4.	Waste (Cum)	7425	12540	1452	21417	7455
5.	Sub-Grade Ore (Ton)	--	12540	1452	13992	-
6.	Ore. (Ton)	44,550	2,00,640	23232	268422	3475

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Development in the third year:-

During the third year, the float ore will be mined at 540 meter RL and Insitu ore will be mined at 650 meter & 644 meter RLs by top slicing method in I.O.B.-I. Production from I.O.B.- II will continue from 599 meter R.L in addition with a new bench 583 meter R.L. And also in this year the production and development of the R.L. 542, 546 & 550m. of Mn-ore is continue. A summarised note on development during third year is given in Table :-5(C-1,C-2).

TABLE :– 5(C-1)

Name of Quarry	Year wise direction of advancement	Working depth (in meter)	Dimension of quarry (L XW)	Stripping ratio
IOB-I	.	17.	378x175	1 : 0.06
IOB-II	Both north & south	5	135x125	1 : 0.59
Float ore zone -I		5	300x20	1 : 0.16
Manganese Quarry	SE	5	105x 75	1 : 2.83

TABLE :- 5(C-2)

DEVELOPMENT PROGRAMME FOR THIRD YEAR (IN TONNE)
(Ref. Plate:-V(C) for Development plan and V'(C) for Sections)

SL. NO	DESCRIPTION	FLOAT ZONE-II	I.O.B.-I	I.O.B.-II	Total	Mn - Ore
1.	Working Benches (R. L.)		650.644	599		565-572
2.	Total Quantity of Excavation(Cum)	51500	126200	34600	212300	11585
3.	Overburden (Cum)	-				-
4.	Waste (Cum)	25750	18930	4572	49252	9847
5.	Sub-Grade Ore (Ton)	-	18930	4572	23502	
6.	Ore. (Ton)	154500	302880	73152	530532	3475

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Development in fourth year :-

During the fourth year, the float ore will be mined at 555 meter RL and mining of Insitu ore will be continue at 637 meter RL in addition with 644 & 638 meter R.Ls. by top slicing method in I.O.B.-I. Production from I.O.B.- II will continue from two nos of new benches with R.L. 617& 611 meter. Production of Mn-Ore will continue from R.L. 566-573 meter. The salient features of the development during fourth year are given in Table :- 5(D-1,D-2).

TABLE :- 5(D-1)

Name of Quarry	Year wise direction of advancement	Working depth (in meter)	Dimension of quarry (L XW)	Striping ratio
IOB-I	-	12	440x175	1 : 0.06
IOB-II	south	12	190x135	1 : 0.06
Float ore zone -I		5	336x25	1 : 0.16
Manganese Quarry	SE	5	110x 95	1 : 2.83

TABLE :- 5(D-2)

DEVELOPMENT PROGRAMME FOR FOURTH YEAR (IN TONNE)
(Ref. Plate:-V(D) for Development plan and V'(D) for Sections)

SL. NO	DESCRIPTION	FLOAT ZONE-II	I.O.B.-I	I.O.B.-II	Total	Mn- Ore
1.	Working Benches (R. L.)		644,638	617,611		566-573
2.	Total Quantity of Excavation(Cum)	122500	170600	34600	327700	13100
3.	Overburden (Cum)	-	-	21400	21400	-
4.	Waste (Cum)	61250	25590	5190	92030	11135
5.	Sub-Grade Ore (Ton)	-	25590	5190	30780	-
6.	Ore. (Ton)	367500	409440	83040	859980	3930

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Development in fifth year:-

During the fifth year, the float ore will be mined at 525 & 575 meter RL and mining of Insitu ore will be continue at 625 meter RL in addition of three nos of new benches with R.L. 632,638& 626 meter R.Ls. by top slicing method in I.O.B.-I. Production from I.O.B.- II will continue from R.L. 611&605 meter in addition with R.L. 571 mtrs. Production of Mn-Ore will continue from R.L. 568-582 meter. The salient features of the development during fifth year are given in Table:- 5(E-1,E-2).

TABLE :– 5(E-1)

Name of Quarry	Year wise direction of advancement	Working depth (in meter)	Dimension of quarry (L XW)	Striping ratio
IOB-I	.	12	478 X 255	1 : 0:06
IOB-II	south	12	205X170	1 : 0.11
Float ore zone -I		5	315X160	1 : 0.16
Manganese Quarry	SE	8	140 X 95	1 : 2.83

TABLE :– 5(E-2)

DEVELOPMENT PROGRAMME FOR FIFTH YEAR (IN TONNE)
(Ref. Plate:-V(E) for Development plan and V(E) for Sections)

SL. NO	DESCRIPTION	FLOAT ZONE-III & IV	I.O.B.-I	I.O.B.-II	Total	Mn ore
1.	Working Benches (R. L.)		638,632 626,620	611,605		568-582
2.	Total Quantity of Excavation(Cum)	122575	588120	91990	814485	16660
3.	Overburden (Cum)	-	-		11800	-
4.	Waste (Cum)	61287	88218	13798	163366	14161
5.	Sub-Grade Ore (Ton)	-	88218	13798	102079	-
6.	Ore. (Ton)	367725	1411488	220776	1999989	4998

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4.3 Preparation of Year wise Plan and Sections:

Year wise plan with sections on sale of 1:1000 have been prepared and coloured distinctly (Ref. Plate:-V(A) to V(C) to represent the excavation limit.

4.3 Proposed rate of production when the Mine is fully developed:-

Production programme of Iron ore and Manganese ore has been phased for the plan period (First five years) in such a manner that development of the quarries and production will go hand in hand, so that the production of marketable Iron ore will be ten times more, at the end of five years relative to the first year. The envisaged production of Iron and Manganese ore in the first year is 0.14 million tons and 2587 tons respectively. By the end of fifth year, the same will be 2.0 million tons and 5000 ton respectively. However, on the basis of results obtained after the full implementation of the suggested exploration programme, a revised production programme may be envisaged, which may call for some mid-course correction in the development as well as production schedules.

In order to maintain a sustained level of production as also to ensure strict quality control confirming to the consumer stipulations, it would be necessary to develop all type of deposits of the lease hold viz- the float ore zone as well as the insitu bodies simultaneously.

4.5 Conceptual Mining Plan:

Geological reserve of Iron ore under proved and probable category has been estimated to be 4701722 tones. Mine able reserve is estimated to be 4493292 tones.

At the proposed rate of production of 19,99,989 tones per annum, life of the mine would be around 6 years, which will be consisting of 5 years proposal planning period and 1 years conceptual planning period.

Geological reserve of Manganese ore under proved and probable category has been estimated to be 245646 tones. Mine able reserve is estimated to be 200952 tones.

At the proposed rate of production of 5000 tones per annum, life of the mine would be around 41 years, which will be consisting of 5 years proposal planning period and 36 years conceptual planning period.

During the conceptual plan period 30 No. of Bore holes will be drilled both in Iron ore zone and manganese ore zone. There are 15no of bore hole will be drilled to cover entire manganese mineralized zone i.e.3.75 ha having 50mx50mt grid spacing. Similarly there are 15 no of bore hole will be drilled which cover about 30 ha of area.

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The generation of sub grade will stack separately Some quantity will be dispatched by process of blending with good quality ore. The amount of sub grade generated i.e. 74369cu.m during the plan period, stacked in the year marked stack yard with an average spreading of 6 mtr. .The area of spreading for the sub grade stack is 1.26 ha The boulder wall and garland drain to be made all around the staking to prevent wash off during the rain season .

The mined out area will be reclaimed partially and rehabilitation programmed will be taken up by planting local species. Similarly the ultimate dump slope will be maintained 20^0 to 22^0 with individual terrace slope s will be 37^0 The over all shape of the dump will be completed and leveled properly The bush and grass will be planted in the slope area and some local species planted in the terrace area to prevent erosion as well as aesthetic view.

All around the quarries and dump garland drain has been made to catch the rain water and pass through the check dam and settling pond to touch the natural drain.

However, the rate of production may likely be change in future depending open the out comes of proper exploratory borehole, method of working and plant requirement.

4.5.1 The ultimate extent & size of the pit:

Conceptual mining will be done up to the R.L. 565m & 598M in iron body –I and manganese quarry and 598 m for Iron body –II which is 15 m below the proposed quarry floor The ultimate extent of the mining pit will be having the dimension of L=907 x W=463m IOB-I.,193 m X 180mfor IOB-II AND 345 m X 120 m for manganese quarry .

4.5.2 Final slope angle at the close of the mine:

Height and width of the benches will be kept at 6m and 8m respectively quarry slop angle therefore will be maintained at less then 40^0 with the horizontal.

4.5.3 Ultimate pit limit boundaries:

The ultimate pit limit boundaries have been earmarked in conceptual plan and the ultimate pit depth are reflected in conceptual sections (Ref. Plate:- X).

4.5.4 Ultimate capacity of dump:

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Overburden and waste material excavated during conceptual mining period will be dumped over the proposed dump.

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Ultimate capacity of the dump will be14,50,000 Cum. Ultimate size of the dump will be 157m x153m x 30m. and 266m x70m x 30m for Dump-I and Dump-II respectively

4.5.5 Land Degradation / Reclamation / Afforestation:

Land-use pattern of mining lease area during the conceptual plan period due to mining and allied activities have been tabulated in next page. The working quarries are not exust till the conceptual year mentioned in the mining plan and the advancement of benches are in all direction So after complete exploration it can be properly access how much area to be reclaimed during conceptual year.

Features	Existing	During Planned 5 Years.	During Beyond 5 Years.
Quarry. and road	Nil	18.950	37.38
Waste dumping.	Nil	4.856	6.630
Sub-grade ore stack.	Nil	0.455	0.455
Infrastructure Site services. (Office, Rest shed etc.)	Nil	0.732	0.732
Green belt.	Nil	3.720	3.720
Total (in Ha.)		**28.713**	**48.937**

4.6 Opencast Mining:

4.6.1 Method of Mining:

Iron ore in the lease area is proposed to be mine-out by semi-mechanized open cast mining. Although the 5th year proposed production of Iron ore will be 2 million ton , to achieve this target ,the Iron ore zone will be developed by fully mechanised in 5th year onwards. The machinery deployment has proposed accordingly. But the raising of lump ore will be done by manual method with the help of skilled labour in the stack yard. Similarly the manganese ore zone will be developed in semi mechnised method. Here also skilled labours will be engaged for picking and sorting .So the category of mines will be category A other than fully mechanized. Height and width of the bench will be kept at 6 and 8 mtr. Respectively. Over all pit slopes 39°, benches will be developed and worked from top to down ward. Drilling and blasting will be performed depending upon the hardness of the strata.

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4.6.2 Layout of mine working:

Layout of mine working and waste dumping have been shown in composite development plan & sections (Ref. Plate:- V) and colouring has been done distinctly for identification of year wise excavation and dumping programme.

4.7 Underground Mining:

Not Applicable.

4.8 Extent of manual / Mechanised mining:

Fully mechanized method of mining will be adopted for excavation of Iron ore and semi-mechanised method adapted for Manganese ore. Excavation, loading and transportation will be performed with the shovel and trucks combination.

4.8.1 Drilling:

For drilling in Iron ore zone, primarily 4"dia DTH drill is used. The drill machine can used to drill hole up to 10m depth easily if required with extra rod attachment. Generally 6-7m holes are required to drill in the benches. This drill machine works in conjunction with a heavy-duty compressor (Atlas Copco, XAH-210). The spacing and burden for 6m hole is generally given at 4m x 3m depending on the fragmentation required.

For secondary drilling as and when required for oversized boulders in the OB and for drilling, jackhammer drilling with 800mm / 1200mm drill rods with tractor mounted compressor are used. The hole diameter is normally 33mm. Considering

difficulties in arranging water in hilly terrain, both, dust extractor and wet drilling is used for drilling purpose. The drillers are also provided with respirators.

The 4" deep hole-drilling machine can drill 60m in one shift. This is used for drilling depending on the requirement of excavation. For secondary drilling the out put per jackhammer is about 60 holes per shift. It is observed that about two holes are required for each tone of ore to be produced.

4.8.2 Loading:

Run off mine iron ore and waste will be loaded in the tipper by excavator for transporting to the dispatch point and waste dump. The details of the excavators are as follows:-

Bucket Capacity = 1.4 Cum.

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Cycle time	=	60 Sec.
Expected operating efficiency	=	75%
Utilization factor	=	80%
Bucket fill factor	=	90%
Working days in a year	=	300
Working hour in a day	=	8
Volume to be handed per bucket load	=	1.4 x 0.85 = 1.19 Cum.

Volume to be handed per hour = $\frac{3600 \times 0.80 \times 1.19}{60}$

= 57.12 Cum.

Year	Volume required to be handed per annum	Volume required to be handed per hour	No. of shovel required.	Remarks
I	56926	23	1	
II	108130	45	1	
III	212300	88	2	
IV	327700	136	3	
V	814485	339	6	

Type	No. at the end of plan period	Size / Capacity	Make
Shovel	6	i) Boom height = 7.5 mtr. ii) Bucket capacity = 1.4 Cum. iii)Engine horse power = 120 BHP iv)Hydraulic Pressure = 250 kg cm	L & T, Komatsu

4.8.3 Transport:

On the basis of average lead of 1.0 km between the quarry, screening / crusher plant and waste dump, the requirement of tippers matching with the shovel will be as follows.

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Truck capacity	=	35 T	
Truck Volume	=	12.96 Cum.	
No. of Bucket load	=	11 No.	
Loading time	=	330 Sec.	
Time taken for load (At the rate of 20 km/hr.)	=	3600 x 1.0 / 20	= 180 Sec.
Time taken to dump and turn	=	120 Sec.	
Time taken for empty journey	=	3600 x 1.0 / 25	=144 Sec.
Spotting time	=	60 Sec.	
Tipper cycle time	=	(330 + 180 + 120 +144 + 60)	
	=	834 Sec.	
Number of Tippers required /Shovel	=	834 / (330 + 120) =2	

Year	Nos. of Tipper required
I	2
II	2
III	4
IV	6
V	12

Type	Size / Capacity	Make (Model)
Dumper	Capacity = 35 T. Engine HP = 50 BHP	Tata

4.8.4 Miscellaneous:

Miscellaneous machinery / equipment (not covered earlier):

S. No.	Name	Capacity	Proposed	Make
1	Dozer	180 BHP Blade Size 400 mm	1	
2	Pneumatic Compressor	180 BHP 12.75 m3 / min flow 12.5 kg / cm2	2	
3	Tractor mounted Compressor	50 BHP 3.1t / min. flow 6 kg / cm2	1	
3	Drill Road	Standard size	As required.	
4	Water tanker		2	
5	Safety equipment such as helmet safety shoes goggles and hand gloves.		As required	

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Yearwise Devlopment (Insitu Ore Body-I)

Year	Sectional Line	R.L.	Cross sectional area	LI	volume	Recovery	Subgrade	Waste	Ore in ton
I	DD	662	157	100	15700	12560	2355	2355	37680
		656	258	100	25800	20640	3870	3870	61920
					41500	**33200**	**6225**	**6225**	**99600**
II	DD'	656	260	100	26000	20800	3900	3900	62400
	EE'	662	121	100	12100	9680	1815	1815	29040
	EE'	656	328	100	32800	26240	4920	4920	78720
	FF'	656	127	100	12700	10160	1905	1905	30480
					83600	**66880**	**12540**	**12540**	**200640**
III	DD'	650	515	100	51500	41200	7725	7725	123600
	EE'	650	284	100	28400	22720	4260	4260	68160
	EE'	644	320	100	32000	25600	4800	4800	76800
	FF'	650	143	100	14300	11440	2145	2145	34320
					126200	**100960**	**18930**	**18930**	**302880**
IV	DD'	644	562	100	56200	44960	8430	8430	134880
	EE'	644	302	100	30200	24160	4530	4530	72480
		638	185	100	18500	14800	2775	2775	44400
	FF'	644	261	100	26100	20880	3915	3915	62640
	GG'	638	440	90	39600	31680	5940	5940	95040
					170600	**136480**	**25590**	**25590**	**409440**
IV	DD'	638	554	100	55400	44320	8310	8310	132960
	EE'	632	634	100	63400	50720	9510	9510	152160
	EE'	626	589	100	58900	47120	8835	8835	141360
	EE'	620	416	100	41600	33280	6240	6240	99840
	FF'	632	518	100	51800	41440	7770	7770	124320
	FF'	626	488	100	48800	39040	7320	7320	117120
	FF'	620	398	100	39800	31840	5970	5970	95520
	GG'	638	646	90	58140	46512	8721	8721	139536
	GG'	632	717	90	64530	51624	9679.5	9679.5	154872
	GG	626	681	90	61290	49032	9193.5	9193.5	147096
	GG'	620	494	90	44460	35568	6669	6669	106704
					588120	**470496**	**88218**	**88218**	**1411488**

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Year wise Development Insitu Ore Body-II

Year	Sectional Line	R.L. m	Cross sectional area (m2)	LI (m)	Volume in m3	Recovery (%)	Waste m3	OB	SUBGRADE	Ore in ton
I	JJ'	605	103	80	8240	6592	1236	10560	1236	19776
II	JJ'	605	51	80	4080	3264	612	4680	612	9792
		599	70	80	5600	4480	840	4560	840	13440
					9680	**7744**	**1452**	**9440**	**1452**	**23232**
III	JJ'	599	381	80	30480	24384	4572		4572	73152
IV	KK'	617	85	100	8500	6800	1275	14800	1275	20400
		611	261	100	26100	20880	3915	6600	3915	62640
					34600	**27680**	**5190**	**21400**	**5190**	**83040**
V	KK'	611	276	100	27600	22080	4140	6800	4140	66240
		605	644	100	64390	51512	9658.5	5000	9658.5	154536
					91990	**73592**	**13798.5**	**11800**	**13798.5**	**220776**

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Year wise development Float Ore Zone

Year	Floor R.L.	Area of Excavation	Average Depth	Total volume of excavation	Ore volume	Waste	Ore in MT
I		1437	5	7185	3592.5	3592.5	21555
II		2970	5	14850	7425	7425	44550
III		10300	5	51500	25750	25750	154500
IV		24500	5	122500	61250	61250	367500
V		24515	5	122575	61287.5	61287.5	367725

Year Wise Devlopment Manganese pit

Year	Area in Sq.m	Average Depth	Volume of excavation	Ore recovery volume	Waste	Sub grade	Ore in Ton
I	1725	5	8625	1293.75	6900	862	2587.5
II	2050	5	10250	1537.5	8200	1025	3075
III	2317	5	11585	1737.75	9268	1158	3475.5
IV	2620	5	13100	1965	10480	1310	3930
V	3332	5	16660	2499	13328	1666	4998

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खान नियंत्रक (मध्यांचल)
Controller of Mines (Central Zone)
भारतीय खान ब्यूरो
Indian Bureau of Mines

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CHAPTER:- 5

5. BLASTING:

As has been stated earlier blasting will be resorted to in the In situ ore working. As adequate provision is made for secondary drilling and blasting there may be no necessity for employing manual labour in the mechanized working faces.

5.1 Broad Blasting Parameter :-

Since the iron ore deposit is not work properly, the behavior of the strata, so far as economic design and performance is concerned will be ascertained by a few trial blasts to start with, However experience and observation from other mines in the region has guided the planners to recommend the following broad blasting parameters to arrive at optimum fragmentation with least possible detrimental effect on the surrounding area and to achieve economy.

Specific explosive consumption of Insitu ore	=	0.7 KG/Cum
Powder factor	=	6 tonnes/kg
Hole diameter	=	100 mm
Bench Height	=	6 Mtr.
Burden	=	3.5 Mtr.
Spacing	=	4.0 Mtr.
Sub-grade Drilling	=	10% of bench height.
Hole depth	=	6.6 Mtr.
Bulk Density	=	3.0

Tonnage blast per hole = Bench height X Burden X Spacing X Bulk density
(in mtr) (in mtr) (in mtr) (t/m^3)

= 252 ton

Therefore tonnage per running meter of hole = 252 / 6.6= 38.18
Total maximum drilling required / day = 126 m
Requirement of drilling machine = 2 no (8 to 10 m drilling per /hr/shift)

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Total maximum explosive required

Volume of excavation (ref 5th year only hard massive)= 6,91,910

Percentage of excavation assume through blasting 60 %
Volume to be loosened through Blasting – 415146
Considering powder factor maximum drilling required per day = 230 kg

5.2 Type of Explosive used / to be used:

Class – III (Power gel) and Class – VI explosive (detonator and safety fuse of standard length) will be used in the mines for conducting blasting operation.

Ammonium nitrate mixed with diesel oil in the proportion of 96:6 gives a very good explosive, which is cheap and viable for blasting. The ANFO will be used as column charge and power gel explosive will be used as primer. ANFO and power gel requirement shall be in the proportion of 70:30 to 60:40 safety fuse in conjunction with ordinary non-electric detonator and detonating fuse combination will be used for ignition.

5.3 Storage of Explosive:

ANFO will be prepared at this site immediately be before charging the hole.

A magazine of 2 (two) ton capacity will be proposed to establish within the leasehold area. However in view of the quantum of excavation, the capacity of the magazine may enhance.

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CHAPTER:- 6

6.0 MINE DRAINAGE:

6.1 Likely depth of Water Table:

Water table is not touched in any quarry till date, which is expected to occur at a depth of 50m or more from the surface level in the mineable area. However the mining will be carried out in the hill, so ground water table may not persist. The proposed excavation will be up to R.L. 593m which is above the R.L. of Baitarani river.

6.2 Expected Working Depth:

Quarries are planned to be operated up to a maximum depth of 15 m and 20 m iron body –I and Iron Body-II respectively from the surface level. Therefore, such depth of working will not puncture the ground water table.

6.3 Quality and Quantity of Water and Drainage System:

Mining will be done along the hilly terrain. Direct precipitated water along with surrounding surface run-off water will flow towards western side lower levels and follow natural slopes & seasonal nalas. Since there will not be accumulation seepage water on the quarry floor, pumping arrangement etc. is not required. However during rain season some water percolate inside the pit, which will be pumped out once after, rain season.

Surface run-off water before entering in to the mine quarries will be diverted to a guided channel which will be boulder pitched to control erosion Boulder wall and garland will be made all around the dumping area. It has been shown in environment management plan (ref. Plate No VII)

Before out let from the mine the surface run-off water will be passed through the check dam and setting tank.

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CHAPTER:- 7

7. STACKING OF MINERAL REJECTS AND DISPOSAL OF WASTE:

7.1 Nature and Quantity of Top soil, and Overburden waste:

The waste materials to be generated during mining operations would be mainly of BHJ as overburden and laterite, shale and BHQ as intermediate waste materials. There will be generation of 486497 Cum. Overburden / waste during the plan period. Yearly generation of waste / overburden, however, will be as follows: -

TABLE: - 8

GENERATION OF WASTE / O.B.

	Dump-I			Dump-II	
Year	OB/WASTE	SWELLED VOLUME	Year	OB/WASTE	SWELLED VOLUME
1st	32581	42355	1st	-	-
2nd	39326	51123	2nd		-
3rd	73196	95154	3rd		
4th	-	-	4th	149517	194372
5th			5th	189264	246043
TOTAL	**145103**	**188632**		**338781**	**440415**

7.2 Land chosen for disposal of Waste/ Overburden:

An area of 2.475Ha. for Dump-I and 2.381 for Dump-II are chosen for dumping of O.B. / Waste. The waste-dumping site is proposed within grid –550 N.- &150N-350N. and within grid 900E-1100E & 700E-850W-for Dump-I, Dump-II respectively. Where there is no such perennial water source nearby.

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7.3 Manner of Disposal:

DUMP-I

The year wise disposal of waste for Insitu ore body and Float ore will be as follows:-

Year.	Volume of O.B. / waste.	Swelled Volume.	Average height of Spreading. In meter
1st	32581	42355	10
2nd	39326	51123	10
3rd	73196	95154	10
4th	-	-	-
5th	-	-	-

DUMP-II

The year wise disposal of waste for Manganese ore will be as follows:-

Year.	Volume of O.B. / waste.	Swelled Volume.	Average height of Spreading.
1st	-	-	-
2nd	-	-	-
3rd	-	-	-
4th	149517	194372	10
5th	189264	246043	10

7.4 Year wise sub grade generation , Selection of site for Sub-grade Stacking:

The quantity of sub grade generated during mining operation has given below and that will be stack in a non-mineral zone, marked in Environment Management plan and Conceptual plan, Plate No. VII & VIII An area of 12600sq.m has been identified for the sub grade stack The amount of sub grade generated i.e. 74369cu.m. will be stacked in the year marked stack yard with an average spreading of 6mtr.The boulder wall and garland drain to be made all around the staking to prevent wash off during the rain season .

Year	Sub grade for iron	Sub grade for manganese
1st	11337	862
2nd	16362	1025
3rd	37599	1158
4th	55732	1310
5th	102079	1666
Total	**223109**	**6021**

7.5 Stacking of Mineral Rejects:

As such there is no mineral rejects generated from the mine during the plan period.

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CHAPTER:- 8

8. USE OF MINERALS:

8.1 End use of Minerals:

At present the lessee has no captive plant for use of the mined out iron ore. Therefore, iron ore raised from the mine will be sized, and screen and is marketed to the various consuming industries.

8.2 Physical and Chemical specification stipulated by Buyers:

Sl. No.	Constituents	B. F. Grade (KIW)	Sponge Iron Grade	
			Sree Metaliks	Export Blue Dust
1	Fe	63-65%	64% (Min.)	63.5%
2	SiO2	-	3% max.	3% max.
3	Al2O3	-	3% Max.	3% Max.
4	Al2O3 ÷ SiO2	6.5%	6%	6%
5	Al2O3 / SiO2	1.5%	-	-
6	CaO + Mgo	-	-	-
7	P	0.05	0.05%	0.05%
8	S	0.02	0.02%	0.02%
9	Ca	0.04	0.01%	0.01%
10	Pb, Zzi	Traces	Traces	Traces
11	Moisture	5% Max.	5% (Max.)	5% (Max.)
12	Size (in mm.)	10-30	5-18	-5

SPECIFICATION OF MANGANESE ORE WITH RESPECT OF CONSUMING INDUSTRIES.

	Blast furnace	Alloy industries
Mn	30%min	30-46%min
SiO2	13%max	13%max
Al2O3	7.5%max	7.5%max
Fe	15-26%	19%max
P	0.18%	0.18%
Moistor	3% max	3% max
Size	10mm-40mm	10mm-40mm

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CHAPTER:- 9

9. OTHER FACILITIES:

9.1 Site Services:

Day to day mine operation will manage by an office at Mines site. Only the rest shed has been made available near the quarries.

However, the required infrastructur facilities like mine office, rest sheds and blasting sheds will be constructed within the. M.L. area to run the mine smoothly.

9.2 Employment Potential:

9.2.1 Management & Supervisory Personnel's:

Mines Manager	Degree in Mining with 1st class Manager of Competency	1
Mining Engineer	Degree in Mining Engineer	1
Geologist	M .Sc in Geology	1
Mechanical Engineer	Degree in Mechanical Engineer	1
Surveyor	Surveyors certificate of Competency	1
Mine Foreman	Diploma in Mining with fire man's certificate of competency	2
Mining Mate	With Mates Certificate of competency	4
Clerk		1

9.2.2 Labourer (skilled / semi skilled / un-skilled):

Although the Mining operation will be carried out by mechanical men. So, very few unskilled labors will be required for misc. purpose. But skilled and semi skilled labourer will required, like Excavator Operator, Dozer Operator, driller, Dumper and Tipper and their helpers for Iron Ore.

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And about 105 No.s of semi skilled and un-skilled labours may require for manual sorting and pick king carried out in the mine .

So, a split figure for the skilled, semi skilled and un-skilled labours are proposed as follows:

i) Skilled	:	50 Nos.
ii) Semi skilled	:	75 Nos.
iii) Un-skilled	:	30 Nos.

9.2.3 Total Personnel:

Management and supervisory personnel	:	12 Nos.
Labour	:	155Nos.
Total	:	**167 Nos.**

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CHAPTER:- 10

10. MINERAL PROCESSING:

10.1 Introduction:

No industrial beneficiation is supposed to be undertaken in the lease area. However the R.O.M. of Iron ore may require sizing and screening.

10.2 Processing Stage:

The R.O.M. of Iron Ore will be excavated by Shovel and Truck combination after blasting and feed to the crusher. In crusher the R.O.M. will be crushed in two stages, first at Primary crusher and then secondary crusher, and that material pass through the screen and produce three type of products:- (1) Fines (-5mm size) (2) D.R.I Grade (+5-18mm size) (3) B.F. Grade (+10-30mm size).

10.3 Plant Machinery:

One crusher of 200 M T/Hr capacity will be installed in the mine site to sizing and screening the ROM in to different specification . The location of proposed crusher site has given in environment management plan and conceptual plan (ref plate VIII & IX). A flow diagram of the proposed crusher has been annexed in annexure II.

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(PART-B)
CHAPTER:- 11

11. ENVIRONMENT MANAGEMENT PLAN:

11.1 Base Line Information:

11.1.1 Existing Land Use Pattern:

As per land schedule, land use pattern is :-

Sl. No.	Type of Land	Revenue Class.	Area (in hects.)
1.	Forest.	Thakurani R. F.	133.579
	Forest	Village Forest	12.193
		Waste	7.155
		Total	152.927

11.1.2 Water Region:

The drainage of the area is controlled by Baitarani River, which flows in the sourth-eastern parts of the buffer zone (Plate-I). Its main tributary, the Sona and Kundra Nadi, drains the north-western parts and meets Baitarani, east of the area shown in Plate-I both are perennial and constitute the source of protected water supply to Joda Township and surrounding villages. Innumerable small streams descend down the hill range and discharge the monsoon water into Sona Nadi in the west and into Baitarani River in the east. Some of these streams are perennial and few by springs.No seepage of water is noticed in the quarries.The water table in the lease area, if exists at all, is very deep.

11.1.3 Flora and Fauna:

No plantation has been done, so far by the applicant in the area. The entire area is classified as forestland. The general character of the vegetation is tropical, dry deciduous type. The floral species found in the forests include Prickly Caesapinias, Flacourtia sepiaria, Gardenis sp., Bulbous and Schizomatious Liliaceae, Diascorea, Terminalia Tometosa, Anegeisus Indica etc. the existence forested part of the lease has mainly sal and other species mentioned above in addition to the trees like Kusum, Naranga, Kendu, Bhaida, Dhoda, Moula, Jamun, Kudi and other bushy vegetations in

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the degraded zones. In the mined out area and abandoned zones of the land wild growth of 'Puru' and Bantulsi' are very common immediately after monsoon.

The strength and number of species in the forest around have dwindled in the recent times due to indiscriminate poaching by the local tribes. Besides, the mining activity and shifting cultivation are also responsible for the migration of the animals from these parts. The following faunal species may be nioticed in the buffer as well as the core zone forests.

Wild animals	=	Elephant, Hyaena, Jackle, Kutra, Monkey, Bear, Gunduchi, Musa, Fox, Rabbit etc.
Birds	=	Partridge, Green pigan, Greyhambill, Jungle fowl, Peafowl, Pecock, Crow etc.
Reptile	=	Rusel viper, common Dhamana and Dhanda.

The area does not fall on the route of any migratory birds/ animals.

11.1.4 Quality of Air, Ambition Noise level and water:

At present there is only medium-scale mining activity in the core zone. The machinery in use includes drills ,compressor excavator and tippers. There fore Ambient air quality parameter like SPM,NO,SO2 etc .are negligible. Dust emission and dust fall is the regular phenomena in mining area., However the dust fall rate has been minimize by spraying water .

The source of noise in the area due to compressor operation and tipper movement .Work zone responds higher noise level and the noise level in the surrounding area is felt to be below 75db(A)

The only source of water for the lease area is the perennial river called Baitarani that about 1.5 km due NE from the lease. The surface runoff water flows through along distance to join in the river allowing moving sediments settle down in the rout .Even this movement of sediments and process of settling happens in rainy season only

11.1.5 Climatic Condition:

ML area experiences an e sub-tropical climate. The climatic condition in the area is generally cold in winter between November and February and hot in summer between March and June. The monsoon sets in late June and continuous up to the end of August. Temperature varies between 12^{0}C (mean minimum in winter) to 44^{0}C (mean maximum in summer). Annual rainfall varies between 1100 mm to 1600 mm.

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Predominant wind direction is NW & SE whose speed varies between 1.5 – 5.0 km/hr. Humidity ranges between 35% to 80%.

11.1.6 Human Settlement:

The lease area has no habitation or any human settlements. The area falls within the revenue limits of Raika village. The villagers occurring within buffer zone together with their demographic profile are given . The salient aspects of socio-economic conditions are presented below.

A. Population Statistics:

Total no of Villages	=	29
No. of Towns	=	1
No. of Households	=	4653
Total Population	=	21847
Rural	=	21847
Male	=	11144
Female	=	10703
Sc	=	1217
St	=	15254

B. Literacy

Male	=	5054
Female	=	2436

C. Categorisation of population

Main workers	=	8239
Marginal workers	=	499
Non-workers	=	21567
Agricultural workers	=	477

a. The area is dominated by the ST. populations.

b. High labour force.

c. Agricultural sector ids not the main source of occupation.

d. Industry, mining and other occupations account for over 70% of the main workers.

e. Employment in agriculture is seasonal.

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11.1.7 Public buildings, place of worship:

The lease area and the buffer zone do not have any places of interest, monuments nor have any features of archaeological, (historical), cultural and aesthetic importance. The area does not form a part of natural park, wild life sanctuary, and natural/ biosphere reserve. The Joda town, however, has some important buildings.

11.2 Environmental Impact Assessment (EIA):

11.2.1 Land likely to be degraded:

The land use pattern in the subject area over a 20 years period expected to be as follows:

		Present area in hect	End of 5th year.	End of conceptual year.
1	Mine spoiled area. And road	Nil	18.950	37.38
2	Dumping site	Nil	4.856	6.650
3	Ore stack yard	Nil	0.455	0.455
4	Site Services	Nil	0.732	0.732
5	Green belt	Nil	3.720	3.720
6	Virgin Area	152.927	124.214	103.99

11.2.2 Impact on Air Quality:

The proposed mining activity in the lease is not likely to have any adverse affect on the air quality either within or outside the core zone. In semi mechanized opencast mining operation such as mining extraction , loading and unloading , movement of dumpers on haul road and external dumping and sizing of ore etc are expected to generate airborne fugitive dusts. The buffer zone has the deleterious constituents like SPM, SO2 and Nox in the air in concentrations much lower than the prescribed limits.

11.2.3 Impact on Water Quality:

(i) SURFACE WATER:

The only way that surface water bodies can be adversely affected by the mining is by clogging of the streams by the deposition of silt carried down from the mining zone during rains. Measures will be suggested to prevent this.

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(ii) GROUND WATER:

The ground water regime may be adversely affected by the seepage and percolation downward of toxic substances dissolved from the stacks, dump and freshly exposed quarry faces. The changes for this are merge as the water table is very deep (if at all it exists) in the zone of mining and the substrate being clayey formation it acts as an impervious layer. Since the deepest part of mining also will not touch any ground water table there will be hardly any impact on the groundwater regions of the downstream area in the lease as well as buffer zone.

(iii) WATER QUALITY:

For the regions started in the previous two sections the water quality of the area will remain unaffected by the mining activity.

11.2.4 Impact or Ambient Noise Level:

Drilling, blasting, operations of the compressor and pumps, movement of vehicles etc are the source of noise. The proposed mining activity is at a low way. The noise producing sources operates for transient periods and the consumption of the Explosives each day will be very low. Although there are no human settlements in the vicinity to be harmed, the workers close to such machines producing noise will be somewhat affected by the higher level of noise generation.

Since there are no engineering structures either within or close to the lease area the question of adverse impact by the vibrations produced in course of blasting does not

arise. Moreover, the change and burden being low the vibrations produced also will not be of any high level to be a matter of concern.

Running of compressors, drills, movement of trucks within the area are the source of noise pollution. Since the area mostly surrounded by forest of noise will be interrupted.

11.2.7 Impact on Socio–Economics:

(i) Social and Demographic Profile:

The impact of social demographic profiles of the area will be minimal compared to what has already taken place in the region due to extensive growth of mining and industrial activity. There has already been migration of skilled personnel from other parts of the country to this region but not to the determent of the local interests. The

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present mines will have marginal impact positively on this aspect in the some local people will find sustained employment in the mine.

(ii) Occupational Health:

The health of the mine workers may be affected by the dust and noise pollution to the contributed by the different activities of mining. Suitable measures will be taken to minimize these adverse effects.

(iii) Human Settlement:

Since there is no habitation within the target area there will be no occasion for displacement or resettlement of people.

(iv) Recreational Facilities:

Some recreational facilities will be provided by the applicant. However, the mineworkers come from the nearby villages and return back to their Hokes after day's work. Attending the weekly markets and other entertainment centers at Joda are part of their recreation.

It is fact that iron ore deposit of Orissa state is located in backward area where the general living conditions of the people is below poverty line. Agricultural is not much developed in the region. People therefore; depend mostly on the iron and manganese mines for their living. This has got a positive impact on living condition of the local inhabitants. At least, these people have been assured of their daily bread.

As per chapter 9 there will be a direct engagement of 167nos. of persons for mining activity. Indirect engagement may be three times more. Purchase facilities general awareness etc will also be improved due to improvement in the socio-Economic condition of the local people by direct and indirect engagement.

11.3 Environment Management Plan:

11.3.1 Temporary storage and utilization of topsoil:

The total top-soil that will be recovered in the first plan period is negligible may be utilized for spreading along the barrier zone for the proposed green belt.

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1.3.2 Reclamation Programme:

During the plan period about 18.647 ha. area will be affected in the mining . The floor of the quarry at the end of the plan period will still be within the ore zone (Plate:- VI & VII) hence no reclamation is possible in this period.

11.3.3 Program of Afforestation:

The location of plantation programmed will be in the safety zone area(ref plateVIII). The programmed of phased afforestations during the plan period is shown in the table as below :-

Year	Location	Area Proposed(in ha)	Spacing proposed	No of Sapling
Ist	Safety zone	0.45	2.5x2.5	700
2nd	-do-	0.45	2.5x2.5	700
3rd	-do-	0.45	2.5x2.5	700
4th	-do-	0.45	2.5x2.5	700
5th	-do-	0.45	2.5x2.5	700
Total		2.25		3500

The species recommended for plantation are (i) Acacia auriculiforms, (ii) ailanthus exoelsa, (iii0 Malia Azadirachta, (iv) Albizza procers, (v) Cassia siamea, (vi) madhuca latefolia, (vii) prosoig julistora (viii) Cassia fistula, (ix) Goldmahur, (x) Jacranda Ovalifolia etc. The location of the plantation area has been Environment Mangement Plan ref Plate No. IX

11.3.4 Measures for Dust Suppression:

Several abatement measures to control the air pollution are proposed. In order to prevent the dust pollution it is necessary to suppress dust generation. The sources of dust generation are mine faces, loading and unloading points, un surfaced dusty haulage and transportation roads and the dust from the dumps and stacks. The following measures are suggested to suppress dust as well as air pollutants like fumes and gases.

a) Regular water sprays near loading and unloading point.
b) To enclose, if possible, the loading and unloading points.
c) The internal roads to be mettalled with literite pieces and covered regularly with ferruginous waste and Lateritic murum.
d) Sprinkling of water on roads during dry m0nths.
e) The exhaust fans of mobile equipment to be directed upwards.
f) Sheeting of loads of fine material.

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g) Water spraying of dumps and re vegetation on them.
h) Growth of green belt and avenue plantation along transport route.
i) Regular and proper maintenance of equipment, machinery and vehicles.

The area being within forest some of the measures suggested are easy to implement requiring less efforts and expenditure.

11.3.5 Stabilization and Vegetation of dumps:

Since the dump material generated in course of mining will not be brought under use till the end of 14th year. As has also been mentioned that the manner of dumping shall be from lower level to the upper, the tips of the dump will become dead first which may be subjected to vegetation. The time schedule of vegetation programmed of dump starts after 14th year onwards.

In order to prevent erosion of dumps, silt-drains and check dams together with growth of grass and bushes are proposed.

The over burden and waste granted from the mine working will dumped in two places separately for both for the Insitu body-land Insitu body _II. The over all shape of the dump will be completed and leveled for not favoring erosion activity of rain and wind. Check dam has been proposed to prevent wash off. Garland drains has been proposed to be developed around the dump to draw water to the natural drain before reaching at the toe for erosion.

The ultimate dump slope should me maintained at 20^0 to 22^0 with individual terraces slopes not exceeding 37^0 . The individual terrace height may be limited to about 10m Each terrace should have inward slope with each drain s at the inward side of the terrace . The each drains of the individual terrace should be connected to the garland drain out side the periphery of the dump. These each drain should preferably have half concrete open pipe followed by settling tank to avoid wash off.

Year wise Dump management

Item	Year	Size	No.
Check Dam	1st	25m x2m x 2m	3
Garland Drain	2nd	Total 1702 m	3
Retaining Wall	2nd	303,265	2
Settling Tank	2nd	20m x 20m x 3m	2

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11.3.6 Measures to control Erosion / Sedimentation of Water Course:

There is no perennial water course within the lease area, surface run off flows through seasonal Nala and finally fall in a perennial Nala which is at a distance around 1 km. However, two nos. of check dam is proposed across the Seasonal Nala to settle / check the flow of the sediments.

11.3.7 Measures for minimizing adverse effect on water regime:

The major cause for concern in this regard is the silt and the fine particulate sediment carried by the water draining the freshly excavated ground, during monsoon months and on other rainy days, the silt load may be deposited in the streams and other water bearing capacity. The streams in the buffer zone may acquire undesirable diversions also. The proportion of dissolved toxic substances like heavy metals is likely to be very low, much lower than the prescribed upper limit, in the discharge water. Construction of bunds and drains around the dumps and across the flow of water, taking care not to leave loose material on the benches and floor of pits, selection of safe sites for dumping and ore stacking, re vegetation and stablisation of dumps and regular monitoring of quality of water leaving the mines will minimize the adverse effects on the surrounding water regime.

There is no possibility of accumulation of ground water in the mine. Source of water for the area / mine is surface run off and direct precipitated water which can generate waste water passing through waste dump, loose soil and exposed surface of the quarry , check dam and garland drain has been proposed to check the wash off and divert the water without touching the quarry and the dump area.

Surface run-off water i.e. rain water before entering in to the mine quarries will be diverted to a guided channel which will be boulder pitched to control erosion Boulder wall and garland will be made all around the dumping area. It has been shown in environment management plan (ref. Plate No VII)

Before out let from the mine the surface run-off water will be passed through the check dam and setting tank.

11.3.8 Measure of for Ground Vibration:

Blasting will be in a small scale and there is no human settlement or any building nearby Vibration caused due to blasting has not been objectionable. However, delay detonators will be used for reduction of the vibration levels as and when required.

APPROVED

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11.3.9 Measure (s) for protecting Historical monuments:

There is no historical monument within 5 km radius of the applied R. M. L. Area. Measures, therefore, in this respect is necessitated.

11.3.10 Socio – Economic Benefit arising out of Mining:

Local people will have lot of direct and indirect employment. Purchase facilities, and cultural improvements will also be developed due to mining medical, communication; educational and recreational facilities will be improved. Life style will be developed and general awareness will be improved.

11.3.11 Any Other Relevant Information:

The sponge iron plant located in the state and outside, require high grade, hard massive iron ore of the kind characteristic of the deposits in the western part of the Bonai- Keonjhar belt. The area in question can contribute ore production also will, in a meet the demand. The manganese ore production also will, in a humble way, help meeting the growing demand of different grades. The lessee has other iron ore lease-holds in the belt including the one having a common boundary with the present one towards south. Should this lease be renewed it would be convenient for the lessee to operate them together without much additional effect and expense. The local population also will be benefited by the increased mining activity in the region.

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CHAPTER:- 12.

12. MONITORING SCHEDULE FOR DIFFERENT ENVIRONMENTAL COMPONENTS:

12.1 Water Quality Monitoring:

Parameters to be examined in water is as per IS : 2296 & 10500, it is proposed to examine water sample of nearby water sources such as seasonal nala & pond for surface water and tube well for sub-surface/ underground water. Frequency of monitoring will be restricted to summer, Monsoon, Post monsoon and winter.

12.2 Air Quality Monitoring:

The parameters like RPM, SPM, So2, Nox and Co are propose to be quantified in the air samples taken from core zone as well as buffer zone.

The phase wise monitoring period will be confined to 8 hours per day, 8 days season (two days per week for one month) and four (4) seasons per year throughout the life of the mine.

12.3 Noise Level Monitoring:

Noise level will be measured in dB (A) at different strategic location at the mine sites and in core area including buffer zone location.

12.4 Organisational Chart for Monitoring:

The job regarding the monitoring of air, water & noise will be tendered to a registered environmental laboratory organization.

A hydrological study will be conducted from a reputed institution after commencement of the mining operation.

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Annexure-II

No. 16150   R-96 / MA

(है० मा० अंशोधासवात)
खान निदेशक

GOVERNMENT OF ORISSA
DEPARTMENT OF STEEL & MINES
...

No.VI-MG-177/87- 5829 /SM.Bhubaneswar,the 24.5.96

From:

Shri B. P. Mohanty,
Joint Secretary to Government.

To

Sri Sabyasachi Pradhan,
Telenga Bazar, Cuttack-753009.

Sub:- Application dt.13.9.66 of Dr.Sarojini Pradhan for M.L. for Iron & Manganese over an area of 438.50 acres in Kalaparbat of Keonjhar district.

Ref:- Your letter No.SP-ML-119/308/90 dt.6.4.90.

Sir,

In inviting a reference to the subject and the correspondence cited above, I am directed to say that it is proposed to grant M.L. for Iron and Manganese over the applied for area of 438.50 acres in village-Kalaparbat of Keonjhar district in favour of all the legal heirs of Late Dr. Sarojini Pradhan, provided they furnish the required documents/informations as per the amended provisions of MM(R&D) Act,1957 and M.C. Rules, 1960.

2. All the legal heirs of late Dr. Sarojini Pradhan are hereby noticed Under Rule-26(3) of the M.C. Rules, 1960 through you to furnish the following information/documents to this Department within a period of 30 days from the date of receipt of this letter.

1) Succession certificate in respect of all the legal heirs of late Dr. S. Pradhan.

2) A statement in writing that you (all the successors) where the land is not own by you(all the successors) have obtained surface right over the area or have obtained the consent of the occupiers/owners of land for starting mining operation.

3) An affidavit showing particulars of areas mineralwise in each State which you (all the successors) or any persons jointly with you (all the successors) ;

i). already hold under a Mining Lease ;

4) An affidavit stating that you(all the successors) have filed upto-date income tax returns, have paid the income tax assessed on you & have paid income tax on the basis of self-assessment as provided in the Income Tax Act,1961 ;

5) Certified copy of the current land schedule of the applied area alongwith current map & current boundary description.

3. Further more, they are also hereby allowed under proviso to Rule-22(3)(V) of M.C. Rules,1960 six months' time from the date of receipt of this notice to furnish the following documents to this Department.

1) Mining plan duly approved by the Central Government.

2) Approval of the Central Government for diversion of Forest land for mining operation as required under Forest (Conservation) Act,1980 ;

4. If the above mentioned documents are not received within the specified period, the mining lease application will be disposed of as per law.

Yours faithfully,

Joint Secretary to Government.

Memo No. _____ / dt.Bhubaneswar, the

Copy forwarded to the Director,Mining & Geology,Orissa/ Deputy Director, Mines, Joda for information.

Joint Secretary to Government.

PC/-

Government of Orissa
Department of Steel and Mines

BY R.P.A.D.

Annexure-IV

No. III(A)SM-29/98- 5782 /SM, Bhubaneswar, the 8.7.99

From:

Sri P. K. Patnaik, OAS(S),
Joint Secretary to Government.

To

1. Dr. Madanmohan Pradhan
2. Sri Satyasachi Pradhan
3. Sri Sidharthe Pradhan
4. Sri Sibananda Pradhan
5. Sri Sunandan Pradhan
6. Srichandrika Pal
7. Sri Satyajit Pradhan

(Legal heirs/successors of Dr. Sarojini Pradhan)
At- Telenga Bazar, Dist. Cuttack- 753009
P.O.

Sub: Application dated 10.9.65 of Late Dr. Sarojini Pradhan for mining lease for Manganese/Iron ore over an area of 438.50 Acres or 177.453 Hects. in village Kalaparbat in the district of Keonjhar.

Sir,

I am directed to enquire whether you accept the following terms and conditions that would govern the grant of mining lease for Iron/Manganese ore for a period of 20 years over an available area of 171.226 hects. in village Kalaparbat of Keonjhar district. Your reply as per enclosed proforma should reach Government on or before 7.8.99 failing which it will be considered that you do not accept the conditions.

1. The lease will be subject to the general terms and conditions laid down in the Model Form of Mining Lease adopted by the State Government and to the following conditions :

i) Royalty and dead rent should be paid at rates provided in the Mines & Minerals (R&D) Act, 1957 and as amended from time to time.

ii) Surface rent should be paid at the rate of Rs. 10.00 per hecta. per annum of waste lands and at rates not exceeding the land revenue and cesses in respect of the cultivated area and water rate as may be fixed from time to time by Government.

iii) An amount of Rs. 2000/- should be deposited towards security deposit for due observance of the terms and conditions stated above. The deposit shall be forfeited to the State if the conditions are not observed in addition to such other remedies of action as may be available under these presents.

iv) The assignment will be liable to cancellation if it be found that it was in excess of the limits of the authority possessed by the State Government.

.....2/-

v) The assignment will be subject to the result of any appeal or revision that may be preferred by any aggrieved party against the decision of the State Govt. granting you lease and in the event of the cancellation of the assignment or the decision of Govt. of Orissa to lease out the area to you either on such appeal or in revision you shall not be entitled to compensation for anything done or attempted to be done in pursuance of the order.

vi) The grantee shall not cut any tree or clear the forest during the mining operation without prior approval of the Central Government. They shall not also damage any objectionable land during mining operation.

vii) The area should be surveyed and demarcated by the State Government at the expense of the lessee as required under rule 33 of the M.C. Rules, 1960. The party should deposit the required amount of survey and demarcation fees within two weeks of the receipt of the grant order.

viii) The mined out area shall be reclaimed to the satisfaction of the State Government before the pit is abandoned.

ix) The assignment is subject to the condition that subject to the provisions of Article 226 of the Constitution of India, any suit of petition in relation to any dispute arising out of the leased area should be filed in the Civil Courts in the State of Orissa.

x) The assignment is subject to condition that they shall have to obtain clearance/approval of MOEF, Govt. of India on de-reservation of forest land over an area of 157 hects. included in the proposed lease area of 171.226 hects. as per Forest (Conservation) Act, 1980. Besides, approval of MOEF on the non-forest land having forest growth shall also have to be obtained, as per the judgement of Supreme Court in S.L.P. No.202 of 1995, if required for the mining purpose.

Yours faithfully

Joint Secretary to Government

Memo No. ______ /SM, Bhubaneswar, the
Copy forwarded to the Collector, Keonjhar for information and necessary action.

Joint Secretary to Government

Memo No. ______ /SM, Bhubaneswar, the
Copy forwarded to the Director of Mines, Orissa/ Deputy Director of Mines, Keonjhar for information and necessary action.

Joint Secretary to Government

7. User agency shall submit a plan for the infrastructural development activities in tribal area (if applicable) setting aside an amount equal to 5% of the total project cost as per the guidelines of the Central Government issued vide letter No.2-1/2003-FC dated 20-10-2003, prior to Stage-II Clearance.

8. The State Government shall deposit all the above-mentioned funds in form of FDs in the name of concerned DFO/ Nodal Officer of the State, in a nationalized bank, till such time the CAMPA intimates the Head of Accounts for deposition of funds.

9. The user agency shall protect the top soil at the project cost.

10. Concurrent Reclamation plan shall be executed by the user agency from the very first year and an annual report shall be sent to the Nodal Officer and the Regional CCF, Bhubaneswar. If it is found from the Annual report that the annual programme mentioned in Concurrent Reclamation Plan is not being adhered to by the user agency, the mining activities shall remain suspended till such time the annual programme is completed for that year.

11. The mining lease shall be coterminus with the current lease granted under MMRD Act, 1957.

12. The user agency shall protect and maintain the 121.731 ha. forest land at the project cost under the supervision of the State Forest Department.

13. Other standard conditions as applicable in respect of mining projects shall apply in the instant case also.

After receipt of compliance report on the fulfilment of the conditions no.1,2,4,5,6 and 7 from the State Government, formal approval will be issued in this regard under Section 2 of the Forest (Conservation) Act, 1980. Transfer of forest land shall not be affected till the formal order is issued by the Central Government in this regard.

Yours faithfully,

Sd/—

(ANURAG BAJPAI)
Asstt. Inspector General of Forests

Copy to:

1. The Principal Chief Conservator of Forests, Government of Orissa, Bhubaneswar.
2. The Nodal Officer, Forest Department, Government of Orissa, Bhubaneswar.
3. The Chief Conservator of Forests (Central), Regional Office(EZ), Bhubaneswar.
4. User Agency.
5. Monitoring Cell of FC Division.
6. Guard file.

(ANURAG BAJPAI)
Asstt. Inspector General of Forests

F. No. 8-177/1997-FC
Government of India
Ministry of Environment & Forests
(F.C. Division)

Paryavaran Bhawan,
C.G.O. Complex, Lodhi Road,
New Delhi-110003

Dated : 15th January 2007

To

The Secretary (Forests),
Government of Orissa,
Bhubaneswar.

Sub: **Diversion of 52.002 ha of forest land in respect of mining lease of Kalaparbat iron ore mines in favour of Dr. Sarojini Pradhan in Keonjhar District of Orissa.**

Sir,

I am directed to refer to your letter No. 10F(Cons)95/2004/14527/F&E dated 24.09.2004 whereunder the above mentioned proposal was submitted seeking prior approval of the Central Government in accordance with Section-2 of the Forest (Conservation) Act, 1980, and to say that the above proposal was examined by the Forest Advisory Committee (FAC) constituted under Section-3 of the Act.

2. After careful consideration of the proposal of the State Government and on the basis of the recommendation of the above mentioned Advisory Committee, the Central Government granted in-principle approval vide letter of even no. dated 04.11.2004 subject to certain conditions. The compliance of these conditions was submitted vide letter No. 10F(Cons)98/2004/167/F&E dated 03.01.2007. After consideration of the proposal and compliance of various conditions by the State Government, the Central Government hereby conveys its approval under Section-2 of the Forest (Conservation) Act, 1980 for diversion of 52.002 ha of forest land in respect of mining lease of Kalaparbat iron ore mines in favour of Dr. Sarojini Pradhan in Keonjhar District of Orissa, subject to the fulfilment of following conditions:-

(i) Legal status of the forest land shall remain unchanged.
(ii) Compensatory Afforestation shall be raised over equivalent non-forest land, and shall be maintained at the project cost.
(iii) The non-forest land identified for Compensatory Afforestation shall be declared as Reserved/Protected Forests under Indian Forest Act, 1927 or relevant State Act. The Nodal Officer shall submit compliance within six months in this regard.
(iv) The mining lease period under the Forest (Conservation) Act, 1980 shall be co-terminus with the current lease granted under MMRD Act, 1957.
(v) The State Government shall deposit all the above-mentioned funds, if not done already, with the Ad-hoc Body of Compensatory Afforestation Fund Management and Planning Authority (CAMPA), in Account No. CA 1585 of Corporation Bank (A Government of India Enterprises), Block-11, Ground Floor, C.G.O. Complex, Phase-1, Lodhi Road, New Delhi-110003, as per the instructions communicated vide letter No. 5-2/2006-FC dated 20.05.2006.
(vi) RCC pillars of 4 feet height shall be erected to demarcate the area by the user agency at the project cost and will be marked with forward and back bearings.

Annexure-VI.

Gram : MINESBURO

भारत सरकार
भारतीय खान ब्यूरो
खान मंत्रालय
GOVERNMENT OF INDIA
INDIAN BUREAU OF MINES
MINISTRY OF MINES

Tel. 2477827 & 400038
Telex : 021-4825 IBM IN

REGISTERED/PARCEL
DELIVERED IN PERSON.
Nizam Palace, 234/4
Acharya J.C. Bose Road,
CALCUTTA-700 020, West Bengal.

No. CAL/RJ/Fe/MP-254.

Dated the 25th Feb 1993.

From : N.N.Bandopadhyay,
Regional Controller of Mines.

To : Dr.Sarajani Pradhan,
Tale Telenga Bazar,
P.O./Dist-Cuttack.
Pin-753009.

Sub : Approval of Mining plan in respect of Kalaparbat Iron and Manganese Ore deposit over an area of 177.63 Hectares in Keonjhar district,State-Orissa.

Ref : Your reference No- i) SP/ML-119/373/91 dated 27.09.91
ii) SP/ML-119/92 dated 15.05.92
iii) SP/ML-219/670/92 dated 5.11.92
Your Consultant Letter No-Nil dated 4.02.93
Your Consultant Letter No-Nil dated 15.02.93

This Office reference No-CAL/RJ/Fe/MP-254 dt 22.01.92
No-CAL/RJ/Fe/MP-254 dt 6.07.92
No-CAL/RJ/Fe/MP-254 dt 30.12.92

Sir,

In exercise to the power conferred by clause (b) of subsection (2) of section 5 of Mines and Minerals (Regulation and Development) Act 1957 read with Government of India Order No.S.O.445(E) dated 2d.4.87.I hereby approve the above said mining plan. This approval is subject to the following conditions:

(i) This mining plan is approved without prejudice to any other laws applicable to the mine/area from time to time whether made by the Central Government,State Government or any other authority.

(ii) This approval of your aforesaid mining plan does not in any way imply the approval of the Government in terms of any other provisions of the Mines and Minerals (Regulation and Development) Act 1957 or the rules framed there under and any other laws.

Contd...2/-

APPROVED

iii) Before commencing mining operation in land under forest, necessary forest clearance from competent authorities should be obtained as per Forest Conservation Act 1980, rules made thereunder and other relevant statutes, orders and guidelines as may be applicable.

iv) Envisaged exploration programme already highlighted in the mining plan (21 boreholes and 25 trial pits) should be carried out within five years from the date of approval of the mining plan. Progress report of the exploration carried out and data generated and upto date geological sections should be sent to the Regional Controller of Mines, IBM, Calcutta at the end of every financial year.

v) As the area includes forest area (more than 20 hects), an E.M.P. has to be prepared as per D.O.E. guidelines and an approved copy of the same shall be submitted to the Regional Controller of Mines, IBM, Calcutta within fifteen months from the date of grant of mining lease/or commencement of mining.

vi) In Key plan, lease area already marked should be made prominent by colouring. Environment Plan shall show all the details of land use within 500 mts of the lease boundary and the details of items under (ii), (iv) and (v) of the rule 26(5)(b) of the MCDR'88, within 50m from the lease boundary.

vii) Manganese ore reserves under 'Potential Category' shall be upgraded by subsequent exploration etc. and report submitted to IBM, soon after the exploration is over.

Encl: Three copies of
approved mining plan.

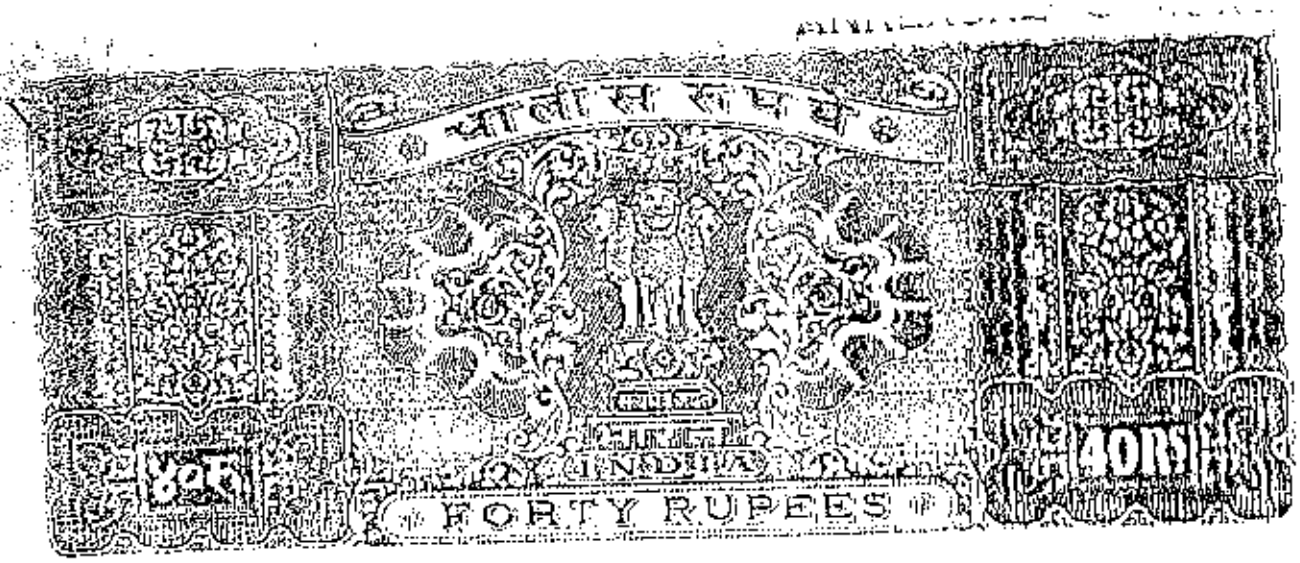
Yours faithfully,

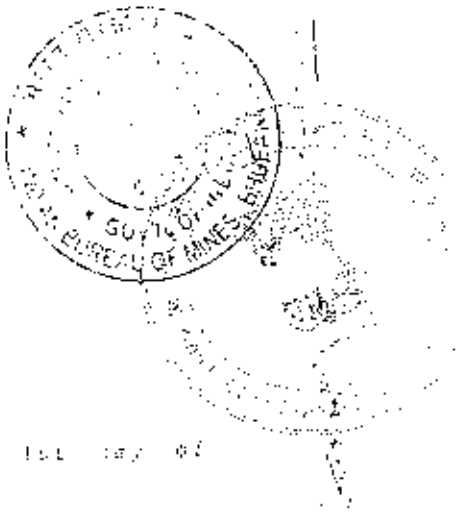
(H.N.Bandopadhyay)
Regional Controller of Mines,
Indian Bureau of Mines.

Copy to Sri M.G.Rao, Consulting Geologist, Flat No-10, Siddhartha Apartment, Mehdipatnam, Hyderabad, Pin-500028, for his information.

(H.N.Bandopadhyay)
Regional Controller of Mines,
Indian Bureau of Mines.

Annexure-V(1)





DEED OF PARTNERSHIP

(M/s. PRADHAN INDUSTRIES)

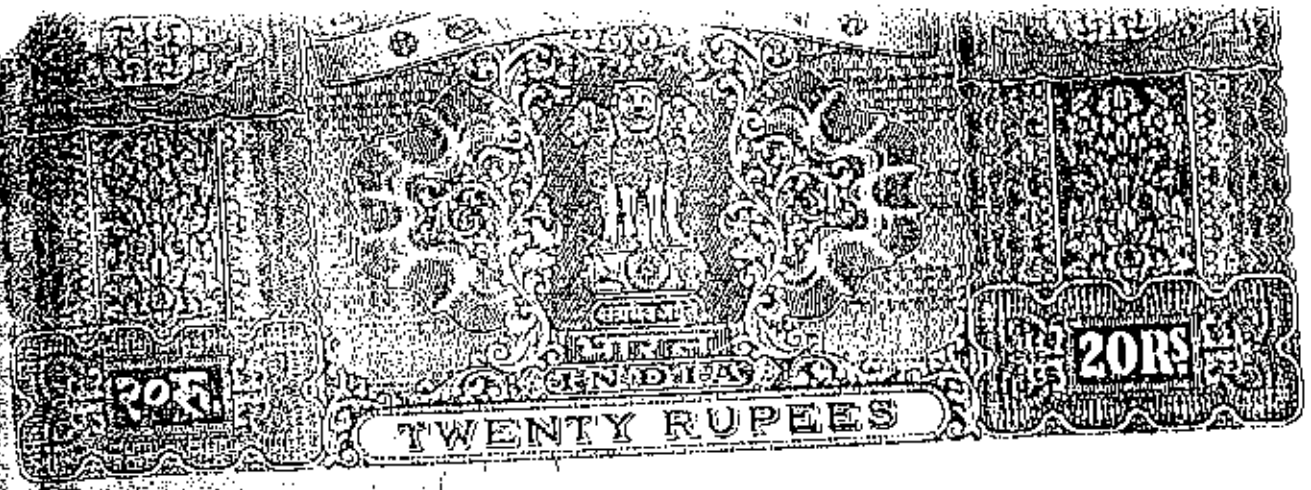
This Deed of Partnership made this 1st day of April, 1992

Between

1. SABYA SACHI PRADHAN, aged 44 years, son of Dr. N.N.Pradhan, resident of Telenga Bazar, in the Town and District of Cuttack, Hereinafter called the Party of the FIRST PART ;

2. SIBANANDA PRADHAN, aged 37 years, son of Dr. N.N.Pradhan, resident of Telenga Bazar, in the Town and District of Cuttack, Hereinafter called the Party of the SECOND PART ;

Contd.. 2



3. SUNANDAN PRADHAN, aged 35 years, son of Dr. M.K.Pradhan, resident of Telenga Bazar, in the Town and District of Cuttack, Hereinafter called the Party of the THIRD PART.

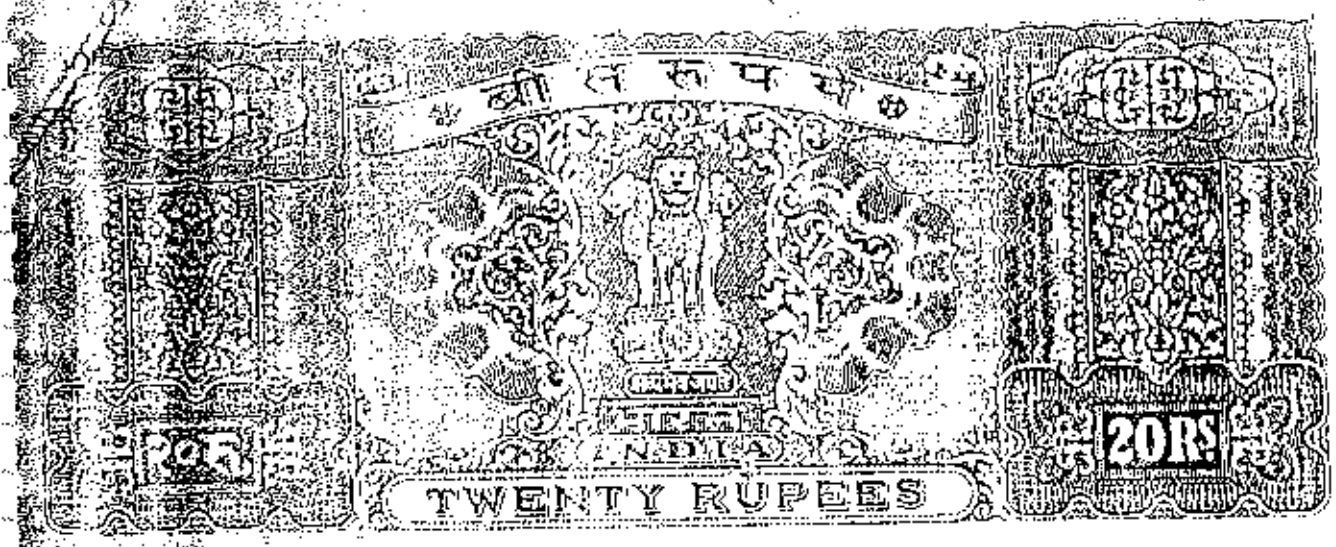
And

4. SATYAJIT PRADHAN, aged 31 years, son of Dr. M.K.Pradhan, resident of Telenga Bazar, in the Town and District of Cuttack, Hereinafter called the Party of the FOURTH PART.

WHEREAS the Parties hereto of the 1st, 2nd, 3rd and 4th Part are carrying on business in Partnership under the name and style of " M/s. PRADHAN INDUSTRIES " at Telenga Bazar, Cuttack under a Deed of Partnership dated 12.01.1982 ;

AND WHEREAS the Parties hereto further decided to reduce the terms, to provide (i) Interest on Capital invested by the partners and (ii) Remuneration to the partners, into writing.

Contd.. 3



Hence this Deed of Partnership.

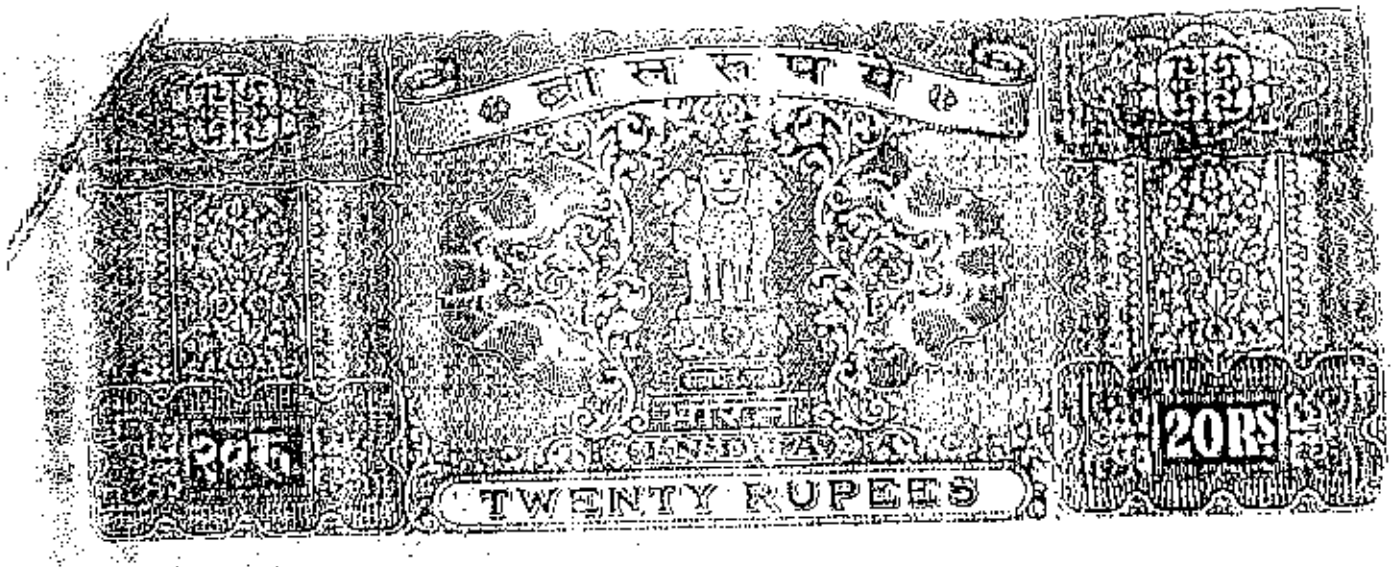
NOW THIS DEED WITNESSES AS FOLLOWS :-

1. That the firm shall continue to carry on its business in the name and style of "M/s. PRADHAN INDUSTRIES" having its Head Office at Telenga bazar, in the Town and District of Cuttack, and Branches at (i) Lakshmipur and Rayagada, in the District of Koraput (ii) Bargarh in the District of Sambalpur and (iii)Bhubaneswar in the District of Puri, all the State of Orissa.

2. That the firm shall be deemed to have reconstituted with effect from 1.4.1992 and shall be a Partnership - At - Will.

3. That the firm may open branch or branches at any other place or places as the partners decide from time to time.

4. That the object of the Partnership shall be to



carry on business of Mining i.e. taking leases of mines and quarries, to raise, supply and sale of ores, to do all connected mining operations, as in past, and act as mining contractors, to undertake execution of contract work and to do industries, to act as order suppliers, to do business as wholesaler, retailer, importer, exporter, commission agent in merchandise of all descriptions and to do such other business as shall be decided by the partners from time to time.

5. That the capital of the firm shall consist of the amounts invested by the Parties of the 1st, 2nd, 3rd and 4th Part as shall be reflected in their personal accounts in the books of account of the firm. The amounts invested by the partners may bear Interest at the prevailing rte as shall be agreed upon by the partners. Such interest shall be a charge to the Profit and Loss Account for determination of the Net Profit or Loss. The firm shall takeover all the assets and liabilities of the erstwhile Partnership business.

Contd.. 5

6. That the partners of the firm i.e. the parties hereto, may charge appropriate Remuneration as shall be decided by the partners and such Remuneration as allowed to the partners shall also be a charge to the Profit and Loss Account prior to determination of the Net Profit or Loss, subject to the limits prescribed under the I.T.Act.

7. That usual books of account shall be kept and maintained by the firm wherein shall be recorded all the particulars of all transactions and shall be kept in the business premises where all the partners shall have free access for inspection of the same at all reasonable hours.

8. That the firm shall follow its accounting year to be FINANCIAL YEAR i.e. the books of account of the firm shall be closed on the 31st day of March every year and at the end of each accounting year the Profit and Loss shall be determined ; assets and liabilities shall be ascertained and the Net Profit or Loss, as the case may be, shall belong to or be borne by the partners in proportion to their shares as mentioned hereinafter.

9. That the shares of the partners in both Profit and Loss shall be EQUAL.

10. That the firm may continue to own the existing bank account(s) or may open new account or accounts with any bank or banks and all such account or accounts shall be created operated upon by any partner, jointly or severally, or by any other person duly authorised by all the partners.

11. That no partner shall endanger the firm and the partners shall keep the firm indemnified against their personal debts and liabilities.

12. That the partners shall remain faithfully to each other and each partner shall be authorised to receive papers, documents, tenders, bills or contracts etc.; to sign and deliver receipts, to sign cheques, drafts and other negotiable instruments on behalf of the firm and to represent the firm in all Government or Semi-Government transactions with any other parties and the act of such partner shal be binding upon the other partner and shall be deemed to be the act of the firm.

13. That the firm shall remain authorised to take loan or borrow money from any person, firm or company or Government or semi Government Institution or any State Financial Corporation, bank etc. as and when necessary.

14. That each partner shall remain authorised to sign, execute, file, register and/or present Tenders, Agreements, Applications, Plaint, Memorandum, Petition, License, Lease Deed, agreements with Orissa State Electricity Board, Government or Semi Government Corporation and other documents for and on behalf of the firm.

15. That each partner shall remain authorised to represent the firm before the officers, Agents or any other authorities of the State and Central Government to appeal

Contd., 7

and conduct cases in court of law to appoint Attorney and Counsels, to sign and verify paint written statement and other document to present and execute Agreement, Deeds and documents before the Collectors, the registering authorities in the court of the Registrar or Sub-Registrar for the purpose of registration and admit the execution thereof and swear Affidavits before the Executive Magistrate and Hon'ble Court on behalf of the firm.

16. That no partner shall retire from the firm without giving the other partner two months' notice in writing prior to his retirement and he shall be allowed to retire from the firm on receiving his share of assets, or on payment or making provisions for payment of his share of liabilities.

17. That the firm shall not be dissolved upon the death of any partner And shall continue to be carried on with the heir, successor or legal representative of the deceased partner.

18. That in all other matters, not covered by this Deed, the firm shall be controlled and governed by the Indian Partnership Act, 1932 subject to the conditions of this Deed.

IN WITNESS WHEREOF the Parties of the 1st, 2nd, 3rd and 4th Part hereto, hereby set their respective hands on the 1st day of April, 1992.

APPROVED

WITNESSES :

1.

2.

EXECUTANTS :

1.

2.

3.

4.

BY SPEED POST

No.2/3/2000-M.IV
Government of India
Ministry of Coal & Mines
Department of Mines

New Delhi, dated the 26th September, 2001

To

The Secretary to the Govt. of Orissa,
Department of Steel & Mines,
Bhubaneswar-751 001

Sub: OJC No.11537 of 1999 filed by M/s Kalinga Mining Corporation Versus Union of India and Others – Grant of mining lease for iron and manganese ores over an area of 438.50 acres or 177.454 hectares in Kalaparbat Hill range of Keonjhar District, Orissa

Sir,

P.456/C Stylinked file (main file).

I am directed to refer to the correspondence resting with your letter No. 2104/III(A)SM.29/98/SM dated 12.3.1999 and your subsequent letters including the letter no.11099/III(A)SM 29/98(Pt)/SM dated 12th September, 2001 on the above noted subject.

P.75/c

2. To recapitulate, the existence of manganese and iron ores in the Kalaparbat area came to light sometime in the year 1953 and that M/s.Kalinga Mining Corporation (hereinafter also referred to as KMC) had applied for grant of prospecting licence on 27.10.53. The State Govt. on 15.9.1961 passed orders granting prospecting licence to KMC in respect of an area of 480 acres. After compliance of necessary formalities, prospecting licence was executed for one year from 17.10.1962 to 16.10.1963. In the meantime on 4.9.1961, KMC applied to the State Govt. for grant of mining lease for iron and manganese ore over 420 acres. As the application was not disposed of within the statutory period, KMC filed revision against the deemed rejection before the Govt. of India under rule 54 of the Mineral Concession Rules, 1960 (hereinafter referred to as the Rules). On 8.10.1963 the Government of India passed orders directing the State Govt. to consider and dispose of the application on merit by 1.1.1964. The State Govt. vide Mining and Geology Department notification No. 5838 dated 20.7.1965 threw open an area of 438.50 acres in Kalaparbat area of Keonjhar district for re-grant under Rule 59(1) of the Rules on and from 10.9.1965. Pursuant to the said notification, six applicants including M/s. Kalinga Mining Corporation and Dr. Sarojini Pradhan (who is since dead and whose L. Rs. are on record now) submitted their applications for grant of mining lease in respect of iron and manganese ore on 10.9.1965. None of the applications having been disposed of

629

by the State Govt. within the time prescribed, they were deemed to have been rejected. Being aggrieved by such "deemed rejection" M/s. Kalinga Mining Corporation as well as Dr. Sarojini Pradhan filed revisions before the Govt. of India. By order dated 7.4.1967, the revisions were allowed and the State Govt. was directed to consider the ML applications. Alleging that no action was taken by the State Govt., M/s. Kalinga Mining Corporation filed revision before the Govt. of India on 22.7.1967 which came to be rejected on 13.10.1967 on the ground that it was premature and not against the deemed rejection. KMC thereafter filed writ petition bearing O.J.C. No. 855 of 1969 before the High Court of Orissa for issue of writ of mandamus directing the State Govt. to grant it mining lease. In that case, Dr. Sarojini Pradhan was an intervenor. A Bench of Orissa High Court by judgement dated 21.6.1971 dismissed the writ petition holding, inter alia, that in the meantime the area in question had been thrown open and KMC had already applied for grant of mining lease which was pending consideration before the State Govt. Pursuant to the remand order of the Govt. of India dated 7.4.67 referred to above, the State Govt. passed an order on 3.9.1971 recommending the grant of mining lease in favour of Dr. Sarojini Pradhan and sought for the approval of the Govt. of India as required under Section 5(1) of the Mines and Minerals (Development and Regulation) Act, 1957 (hereinafter referred to as 'the Act'). The Govt. of India by its order dated 18.2.1972 however, refused to accord its approval. The State Govt. informed the Govt. of India by letter dated 25.4.1972 that in its previous communications it had informed the Govt. of India that it was inclined to grant mining lease in favour of Dr. Sarojini Pradhan. On 29.12.1972 the Govt. of India under the belief that its earlier decision dated 18.2.1972 had not been complied with by the State Govt. directed it to reject the application of Dr. Sarojini Pradhan. By order dated 8.6.1973 the State Govt. rejected the mining lease applications of all the six applicants. Consequently, revisions were filed before the Govt. of India by all the applicants. Govt. of India in its revisional order dated 2.5.1978 rejected the revision application of Dr. Sarojini Pradhan but revision application of M/s. Kalinga Mining Corporation was allowed with a direction to the State Govt. to pass fresh orders on merit. Against this order dated 2.5.1978 of the Govt. of India by which it rejected the revision application of Dr. Sarojini Pradhan, she filed a writ petition bearing O.J.C. No. 829 of 1978 before the Orissa High Court, which was allowed vide judgement dated 4.9.1987 (A.I.R. 1988 Orissa 96). The operative part of the judgement reads as follows:

> *"We direct the Central Govt. to re-consider the question of grant of approval for the grant of lease of iron ore and manganese in respect of the area after giving all parties concerned an opportunity of hearing. The mode and manner of hearing shall be regulated by the Central Govt. and it shall convey its decision by a speaking order, i.e. by giving reasons for the decision."*

3. In view of the directions given by the Orissa High Court in the said writ petition, the Central Government took a decision under section 5(1) of the Act to approve the grant of mining lease for iron and manganese ores over an area of 438.50 acres in Kalaparbat area of Keonjhar district in favour of the legal heir(s) of Dr.S. Pradhan who had expired during the pendency of the proceedings. This order dated 11.5.90 of the Central Government was assailed before the Orissa

High Court by M/s.Kalinga Mining Corporation in writ petition No.4316/90 which was disposed by the High Court vide Judgement dated 13.12.96. The operative para 13 of the Judgement is as follows: -

> *"It is no doubt true that the petitioner has not produced the copy of the order which is sought to be quashed. Instead, only copy of the letter dated the 11th of May 1990 communicating the decision, has been filed. But then, neither the Central Government nor the State counsel or the opposite parties 4 to 9 have also been able to produce the copy of the order before us. As mentioned in the earlier part of our judgement, in spite of two years' time having been granted, the Central Government has neither produced the file nor it has been able to produce the order impugned to show that it was a reasoned order. On the contrary, it has also not cared to file an affidavit in reply. We have, therefore, no hesitation to hold that the order having been passed in utter disregard to the direction of this Court given in O.J.C.No.829 of 1978, it cannot be sustained and, accordingly, we quash Annexure-1 and necessarily also the order of approval of the Central Government for grant of mining lease in favour of opposite parties 4 to 9. We direct the Central Government to reconsider the matter and pass a fresh speaking order, i.e. giving reasons for its decision, after hearing the present petitioner and M/s.Balasore Minerals Company, who were intervenors in the earlier petition and whose revisions were allowed by the Central Government, which had remanded the matter to the State Government for a reconsideration, while dismissing that of Dr.S. Pradhan."*

4. The judgement of the Orissa high court called for issuing a fresh order for grant of Mining Lease over an area of 438.50 acres after giving hearing to M/s.Kalinga Mining Corporation and M/s.Balasore Minerals Company. For implementation of Orissa High Court's order, the proposal was to emanate from the State Govt. State Govt. was therefore requested by the Central Govt. to furnish a fresh proposal for grant of ML over 438.50 acres in village Kalaparbat of Keonjhar Distt. After repeated reminders, State Govt. of Orissa sent the proposal vide letter No.847/III(A)SM-29/98/SM dated 5.2.99 for grant of ML for iron/manganese ore over an area of 171.226 ha in village Kalaparbat of Keonjhar distt. in favour of the legal heirs of late Dr.S. Pradhan for a period of 20 years under Sec.5(1) of the Act. State Govt. also informed that out of 438.50 acres (177.454 ha), an area of 6.228 hects. has already been granted under PL to one M/s.Kushaleswar Minerals on 13.2.1996 by the State Govt. and hence the proposal was submitted for the balance area 171.226 ha [177.454 – 6.228].

5. As per the directions of the Orissa High Court, the three remaining parties, namely, M/s Kalinga Mining Corporation, M/s Balasore Minerals Co., Legal heirs of Late Dr. Sarojini Pradhan and the State Govt. of Orissa were heard by the Central Govt. on 18.3.99.

6. Keeping the submissions of the parties into account, the following issues were framed for consideration at this point in time:

i) Dr. Sarojini Pradhan, the original applicant, who had submitted the mining lease application on 10.9.65 died on 10.9.87. It was thus

required to be considered as to whether her mining lease application has abated or it survived ?

ii) State Govt. has granted PL to M/s Kushaleswar Minerals on 13.2.96 over 6.228 hects. which forms a part of the notified area of 177.454 hects (438.50 acres). It thus needed consideration as to whether grant of this PL was valid?

iii) Out of the three interested parties, who applied for mining lease on 10.9.65, which party has a better claim for grant of mining lease under the scheme of the Act and the Rules?

7. After examining and deciding the three issues, Central Govt.'s approval was conveyed to Govt. of Orissa's proposal for grant of mining lease for iron and manganese ore over an area of 171.226 hects. in village Kalaparbat Range Hill, district Keonjhar in favour of legal heirs of Late Dr. Sarojini Pradhan vide this Ministry's letter No.2/9/94-M.IV dated 8.4.99. It was also decided that for the balance area of 6.228 ha. granted under PL in favour of M/s Kushaleswar Minerals, suo moto proceedings may be initiated by the Central Govt. under Section 30 of the Act.

8. The order of the Central Govt. dated 8.4.99 has been challenged by M/s Kalinga Mining Corporation in OJC No.11537/99 which has been disposed of by the Hon'ble Orissa High Court on 2nd July, 2001 with the following observations:-

"In the result, the impugned order of Govt. of India dated 8.4.99 (at Annexure-3/1) is quashed. The matter is remitted to it for fresh disposal in accordance with the earlier directions issued by this Court. Before the matter is taken up for hearing, the Govt. of India will furnish a copy of the proposal sent by the State Government recommending grant of mining lease in favour of the legal representatives of deceased Dr. Sarojini Pradhan to the petitioner who will appear before it on 18.7.2001 to receive the same. As it is a long pending dispute, it is necessary that time limit should be fixed for the disposal. We may state here that one applicant, namely, M/s Balasore Mineral Company was heard by the Government of India before the impugned order was passed. Since it has not challenged the order, fresh hearing will be confined to the petitioner and the legal representatives of deceased Dr. Sarojini Pradhan.

Accordingly, we call upon the Government of India to dispose of the matter afresh by a speaking order after notice to the legal representatives of deceased Dr. Sarojini Pradhan as early as possible preferably by the end of September, 2001 and after complying with other formalities.

The writ petition is accordingly allowed. No costs."

9. As directed by the Hon'ble Orissa High Court, a copy of the proposal sent by the State Govt. of Orissa for grant of ML in favour of LRs of Late Dr. Sarojini Pradhan was given to Smt. Punam on 18.7.2001 who appeared on behalf of M/s Kalinga Mining Corporation to collect the same.

10. The hearing in compliance of the order of Hon'ble Orissa High Court dated 2nd July, 2001 – OJC No. 11537/99 was held on 28th August, 2001. M/s. Kalinga Mining Corporation was represented by Shri Shambhu Prasad Singh, Advocate, Ms Punam Kumari, Advocate, Shri Sushanta Mohanty, Partner, M/s. Kalinga Mining Corporation. The legal heirs of late Dr. Sarojini Pradhan were represented by Shri B.N. Singhvi, Advocate, Shri A.K. Sahu, Advocate and Shri Sabhya Sachi Pradhan L/R of Late Dr. Sarojini Pradhan. The State Govt. of Orissa was represented by Dr. D.K. Mishra, Joint Director of Mines.

11. Both the parties submitted written statements about their financial and technical capabilities. Copy of the two statements were given to the representative of the State Govt. and the representative was requested to check the veracity of the statements made by both the parties and give its report by 7th September, 2001, with copies thereof to the two parties. The parties were asked that if they have counter comments on the comments of the State Govt., the same may be furnished by 12th September, 2001.

12. A request was made to both the parties to furnish mine-wise details of the extent of mining lease, date of grant of mining lease/renewal of mining lease, yearly production from the mines during the last 5 years and yearly payment of royalty.

13. It was informed during the hearing that one SLP was filed by legal heirs of Dr. Sarojini Pradhan before the Hon'ble Supreme Court of India challenging the Order of Hon'ble High Court of Orissa dated 2nd July, 2001. This SLP has been dismissed by the Hon'ble Supreme Court on 27th July, 2001. The party was requested to furnish a copy of the SLP and the Order of the Hon'ble Supreme Court thereon.

14. It was also informed that M/s Kalinga Mining Corporation had also filed SLP before Hon'ble Supreme Court challenging the Order of the Hon'ble High Court dated 2nd July, 2001 relating to the decision regarding abatement of mining lease application of Dr. Sarojini Pradhan. This SLP has also been dismissed by the Hon'ble Supreme Court on 24th August, 2001. The party was requested to furnish a copy of the SLP and the orders of the Hon'ble Supreme Court thereon.

15. A report was separately solicited from Indian Bureau of Mines regarding the working of the mining leases of the two parties.

16. In pursuance of the hearing held on 28th August, 2001, further hearing was done on 13th September, 2001. M/s Kalinga Mining Corporation Ltd. was represented by Shri Shambhu Prasad Singh, Advocate and Miss Punam Kumari, Advocate. The legal heirs of late Dr. Sarojini Pradhan were represented by Shri Abani Kumar Sahu, Advocate and Shri S.S. Pradhan, LR of late Dr. Sarojini Pradhan. The State Government of Orissa was not present.

17. Copies of letter No. 0-11012/2/89-CCOM. Vol. III dated 6.9.2001 received from the Indian Bureau of Mines (IBM) were made available to both the parties. Copies of letter No. 11099.III(A)SM.29/98(pt.)SM dated 12.9.2001 received from the State Government of Orissa were also made available to both the parties. Copies of submissions, written arguments and other details furnished by M/s.

Kalinga Mining Corporation Ltd. have been made available to the LRs of late Dr. Sarojini Pradhan and vice versa. Thus all the documents available with the Central Government are also available with both the parties.

18. At the time of consideration of the proposal for grant of mining lease over the area in question on 18.3.99, three issues had emerged which are listed at para 6. Now two of the three issues, namely, issues no.(i) and (ii) have already been settled as would be evident from the following paras.

19. As regards the first issue regarding the abatement of the mining lease application filed by Dr. Sarojini Pradhan after her demise, the issue has been settled by the Hon'ble Orissa High Court vide the aforementioned order dated 2.7.2001 where the Hon'ble High Court has observed as follows:-

> *"We respectfully concur with the opinion rendered by the two Benches of this Court in the aforesaid cases. We accordingly hold that with the death of the original applicant, his/her application for prospecting licence or mining lease does not abate. This is also evident from Rule 25-A (1) of the Mineral Concession Rules, 1960 which provides as follows:*
>
> *" 25 – A. Status of the grant on the death of applicant for mining lease:*
>
> *(1) Where an applicant for grant or renewal of mining lease dies before the order granting him a mining lease or its renewal is passed the application for the grant or renewal of a mining lease shall be deemed to have been made by his legal representatives."*
>
> *The aforesaid being the legal position, the objection raised on behalf of the petitioner has no merit and in the impugned order the same has rightly been over-ruled. This being a pure question of law, we hold that this issue has become final and shall not be reopened and the Government of India shall not further deal with this issue now on remand."*

20. The order of the Hon'ble High Court regarding abatement of the mining lease application filed by Dr. Sarojini Pradhan was challenged by M/s Kalinga Mining Corporation before the Hon'ble Supreme Court in a SLP which has been dismissed by the Hon'ble Supreme Court vide their order dated 24th August, 2001. Hence this issue has become final and the Central Govt. is not required to further deal with this issue.

21. As regards the second issue about grant of PL over 6.228 ha. out of the applied area in favour of M/s Kushaleswar Minerals, suo moto proceedings were initiated by the Central Govt. in exercise of powers under Section 30 of the MMDR Act, 1957 and the matter was considered by the Tribunal dealing with the cases pertaining to Orissa State (Tribunal consisting of Mrs. Aruna Bagchee, Joint Secretary (Mines) and Shri N.C. Jain, Joint Secretary, Legal Affairs). The matter has been decided by the Tribunal vide Final Order No.71/2001 dated 10.8.2001. The operative portion of the final order is as follows:-

> *"12. On going through the case as brought out above, it is seen that M/s.Kushaleshwar Minerals had applied for the area of 6.2 ha on*

27/11/1992 and the date on which a PL was granted to this party is 13/2/1996. The contention of the State Government is that during this period, all the other applications had been rejected or were deemed to have been rejected and there was no stay to the grant of this area. This contention is not entirely true because the order dated 11/5/1990 of the Central Government approving the grant of mining lease over an area of the entire 177.454 ha in favour of the legal heirs of Dr. Sarojini Pradhan had been challenged before the Orissa High Court by M/s.Kalinga Mining Corporation in writ petition No:4316/90 which was disposed of by the Hon'ble High Court vide its judgement dated 13/12/1996. In other words, while the State Government was processing Kushaleshwar Minerals' application for PL over the area of 6.2 ha, the dispute over the entire area of 177 ha was still sub-judice before the Orissa High Court.

13. Taking the overall dimensions of the case, we find that it is true that at the time that the State Government was processing the application to M/s. Kushaleshwar Minerals, it had rejected all the other pending applications for this area. Moreover, there was no stay to the re-grants of this area from the High Court where the matter was pending. Most importantly, the grant of 6.2 hectares from this area in favour of M/s.Kushaleshwar Minerals was done with the prior approval of the Central Government. In terms of processing the case, therefore, the State Government had followed the MMDR Act. After the order of the High Court, the State Government has taken into consideration the grant of 6.2 hectares in favour of Kushaleshwar Minerals and recommended the remaining approximately 171 hectares in favour of the legal heirs of Dr. Sarojini Pradhan, and none of the original applicants has objected to this. In view of this, we find that there is no justification for interfering in the situation at this point in time. These proceedings are, therefore, dropped."

22. Hence, now the second issue has also been settled by the Central Government and therefore the area available for grant now is 171.226 ha.

23. In the light of settlement of the other two issues, the Central Govt. is required to determine as to which of the applicants should be granted mining lease over the balance area of 171.226 ha. It may be recalled that six applicants had applied for grant of ML on 10.9.65 in pursuance of the notification for regrant under Rule 59(1) of the Rules. However, four of the six parties have fallen by the way side during the course of the protracted litigation and the Central Govt. is required to consider the ML applications of only two applicants, viz., M/s Kalinga Mining Corporation and the LRs of late Dr. Sarojini Pradhan in accordance with the orders of the Hon'ble High Court of Orissa dated 2nd July, 2001 quoted at para 8 above.

24. During the hearing, the learned counsel of KMC had raised a preliminary issue that as a prospecting licence was granted in favour of KMC, KMC was entitled to preferential rights on allotment of ML under Section 11(1) of the Act. The learned counsel cited the following two rulings to support his case:-

(i) Kolagada Chennabasappa Vs. State Government of Mysore and Others reported in AIR 1966 Mysore 167 (V 53 C42).

(ii) Barium Chemicals Ltd. Vs. Govt. of India and Others reported in AIR 1987 Andhra Pradesh 267.

This was contested forcefully by the learned counsel for the LRs of late Dr. Sarojini Pradhan who submitted that this issue has already been settled by the High Court of Orissa in OJC No.855 of 1969 filed by KMC.

25. Under the existing scheme of the Act and the Rules, a PL holder has preferential right for grant of a ML only till the time the area has not been notified for regrant. Once the area is notified for regrant under Rule 59(1) of the Rules and applications are solicited for grant of ML for the notified area, then all the applicants who submit applications for grant of ML in response to the notification for regrant have to be assigned priority according to the provisions of the second proviso to Section 11(2) of the Act read with Section 11(3) of the Act. The logic for this is simple. If the State Govt. is satisfied that the PL holder has complied with the conditions stipulated in Section 11(1) of the Act, then the State Govt. assigns priority to the PL holder and grants the ML. But, if the State Govt. is not satisfied, then the State Govt. notifies the area held under the PL for regrant under Rule 59(1) of the Rules. The third proviso to Rule 59(1)(ii) makes the position very clear. This proviso prescribes as follows:-

> *"Provided also that where an area held under a reconnaissance permit or a prospecting licence, as the case may be, is granted in terms of sub-section(1) of section 11, no notification under clause (ii) shall be required to be issued."*

26. It is, thus, crystal clear that if the State Govt. deems it appropriate to assign priority under section 11(1) of the Act, then it would not notify the area for regrant. In this case the area held under PL by KMC has been notified for regrant under Rule 59(1) of the Rules on 20.7.65 and hence the preferential rights of KMC under section 11(1) of the Act ends with the notification for regrant. If KMC had any objection on this account, he should have challenged regrant notification dated 20.7.65 and should have got the notification set aside. The validity of 1965 regrant notification cannot be challenged before the Central Govt. now after a period of 36 years.

27. This issue was also examined by the Hon'ble High Court of Orissa in OJC No.855 of 1969 filed by KMC. In para 5 of their judgement dated 21.6.71, the Hon'ble High Court has observed as follows:-

> *" The first ground is clearly untenable. Admittedly when the notification dated 20.7.1965 was issued by the State Government throwing open the area, the petitioner did not make any grievance of it. On the other hand, he took advantage of the notification by making a fresh application. Now that the State Government have recommended the grant to another person, the petitioner cannot turn round and challenge the validity of the notification. If his objection is confined only to the validity of the notification dated 20.7.1965, we would reject the application mainly on the ground of inordinate delay in approaching this court without going into the merits thereof and especially when no specific orders have so far been passed by the State Government on the application of the applicant dated 10.9.1965. The petitioner had*

(62)

preferred a revision petition before the Central Government. Even there he did not raise any objection to the action of the State Government in throwing open the mining area for grant of mining lease. It is, therefore, too late for the petitioner to agitate that question especially in a writ proceeding."

28. The two rulings quoted by the learned counsel for the petitioner are not applicable in the instant case. What has been held in these rulings is that a prospecting licensee has an overriding priority over others. That indeed is the legal position. But the right of the prospecting licensee is only till the time he has the prospecting licence. The moment the area is notified for regrant, his right ends.

29. In the light of the observations of the Hon'ble High Court of Orissa quoted at para 27 and also the legal statutes, the preliminary point raised by KMC is not valid and KMC does not have a preferential right under Section 11(1) of the Act for grant of ML.

30. In pursuance of the notification for regrant both KMC and Dr. Sarojini Pradhan had submitted their ML applications on 10.9.1965 and hence these are simultaneous mining lease applications. Under the existing scheme of the Act and the Rules, the second proviso to Section 11(2) of the Act read with Section 11(3) of the Act prescribes the procedure for deciding simultaneous mining lease applications.

31. The second proviso to Section 11(2) of the Act which deals with simultaneous applications prescribe as follows:-

"Provided further that where any such applications are received on the same day, the State Government, after taking into consideration the matters specified in sub-section (3), may grant the reconnaissance permit, prospecting licence or mining lease, as the case may be, to such one of the applicants as it may deem fit."

32. The matters which should be considered in case of simultaneous applications have been detailed in Section 11(3) of the Act which reads as follows:-

"(3) The matters referred to in sub-section(2) are the following:-

(a) any special knowledge of, or experience in reconnaissance operations, prospecting operations or mining operations, as the case may be, possessed by the applicant;

(b) the financial resources of the applicant;

(c) the nature and quality of the technical staff employed or to be employed by the applicant;

(d) the investment which the applicant proposes to make in the mines and in the industry based on the minerals;

(e) such other matters as may be prescribed.

33. The State Govt. had examined the relative merits and demerits of the two parties while forwarding their proposal dated 5.2.1999 and their recommendations in this regard are as follows:-

i) M/s Kalinga Mining Corporation Ltd. : Although KMC holds 5 nos. of iron/manganese mines, they are unable to operate the mines by themselves. Out of the 5 nos. of mines, the lessees are working only one mine, i.e., Joruri Manganese Mines over 54.754 ha by themselves, they are keeping idle their other Joruri Manganese Mines over 39.456 ha. since 1995. Besides, their 3 other Iron mines over 12.690 ha., 27.170 ha. and 135.569 ha are being worked through their contractors namely M/s Aurobinda construction Corporation Ltd. It, therefore, appears that they do not have suitable technical staff and adequate funds at their disposal to operate all the mines themselves and have given it to existing contractors to exploit the mines. Their financial status is not so sound, they have not employed suitable technical personnel to supervise the mining work.

ii) Legal heirs of Dr. Sarojini Pradhan : They are holding 3 iron/manganese leases over an area of 106.342 ha. in Keonjhar district. Of these, they are not able to operate 2 mines over an area of 43.45 ha. for want of clearance of forest land. As such they are exploiting one iron and manganese mine over an area of 62.892 ha. and this is being exploited regularly. They have employed technically qualified mining personnel for proper supervision of mining work. There is regular production and despatch of iron ore from this mine. They have also deployed mining machinery and equipments for systematic and scientific working of the mines and propose to set up a crusher plant of 60,000 metric tonnes capacity per annum at the mining site. Their financial position is sound. They have employed all types of technically qualified personnel for exploration and exploitation of minerals. They have already installed a crusher plant at Baitarani iron mines with 80,000 MT capacity per annum for value added products. Their sister concern, viz., M/s Pradhan Industries have installed two graphite beneficiation plants at Koraput and Rayagada districts of Orissa which are value based industries generating employment of technical personnel and tribal labourers.

34. In view of these facts the State Govt. has recommended that the legal heirs of Late Dr. Sarojini Pradhan get preference over KMC.

35. Documents have been furnished by both the parties about their technical and financial capability etc. Report of the State Govt. of Orissa dated 12.9.2001 has been received about the claims of both the parties and the report of IBM has also been received about the current status of mining leases of the two parties.

64

36. As per IBM report, the individual mine-wise position and the production from the mines during the last two years is as follows:-

Kalinga Mining Corporation:

S.No.	Name of Mine	Mineral	Total ML Area (in ha)	Production of Mineral (In Tonnes)	
				1999-2000	2000-2001
1.	Jururi	Iron Ore	135.569	34960	22290
2.	Jururi	Iron Ore	12.69	3100	2500
3.	Jururi	Iron Ore	27.17	650	600
4.	Jururi	Iron Ore and Manganese	54.754	40	15
5.	Jururi	Manganese	39.454	-	-

Legal heirs of Late Dr. Sarojini Pradhan

S.No	Name of Mine	Mineral	Total ML Area (in ha.)	Production of Mineral (In Tonnes)	
				1999-2000	2000-2001
1.	Baitarani	Iron Ore	52.892	27178	20382 (10 Months)
2.	Balita	Iron Ore	34.75	53237	38628 (10 Months)
3.	Inganijharan	Iron Ore & Manganese	18.70	-	-
4.	Kutra	Limestone & Dolomite	246.189	-	-

37. The State Govt. in their report dated 12.9.2001 have made the following comments about the mining operations undertaken by the two parties.

"(1) Late Dr. Sarojini Pradhan

The following four mining leases are in name of late Dr. S. Pradhan for iron and manganese and limestone.

(i) Baitarani Iron ore mines over 52.892 hects - 20 years from 16.9.80.

(ii) Inganijharan iron and manganese mines over 18.70 hects – 20 years from 1.2.64.

(iii) Balita Iron ore mines over 34.75 hects. – 30 years from 1.2.64.

(iv) Kutra limestone and Dolomite mines over 246.189 hects. – 20 years from 8.10.92.

The Balita and Baitarani Iron ore and manganese mines are in operation while the Inganijharan and Kutra Limestone and Dolomite mines are non-working. The Inganijharan Iron and Manganese mines has been kept idle for want of de-reservation of forest land under Forest Conservation Act, 1980 and Kutra Limestone and Dolomite mines has been kept idle for non-available of sales outlet of poor quality mineral available in the area. The working mines for Iron and Manganese ore do have regular production and despatch with 155 labourers per day on average during the year 2000-2001. The legal heirs of Dr. S. Pradhan have commissioned a Crusher Plant of 60,000 Mts. Capacity in their Baitarani Iron and Manganese lease hold. Both the mines being worked under the provisions of Rule 24-A (6) of Mines and Minerals (Development and Regulation) Act, 1957 and awaiting grant of renewal.

(2) <u>M/s Kalinga Mining Corporation:</u>

The Corporation is holding the following 5 leases for iron ore and manganese ore in Keonjhar District:

(i) Jururi Iron ore mines over 135.596 hects – 20 years from 1.4.77.

(ii) Jururi Iron ore mines over 27.17 hects – 20 years from 22.6.73.

(iii) Jururi Iron ore mines over 12.690 hects – 20 years from 22.6.73.

(iv) Jururi Manganese mines over 39.456 hects – 20 years from 22.6.73.

(v) Jururi Manganese mines over 54.754 hects – 20 years from 22.6.73.

The term of all the leases of the firm have expired and these leases are under the process of renewal. Out of five leases, three Iron ore mines and one manganese mines over 54.754 hects. are in operation. The other manganese mines over 39.456 hects. has been kept idle. The firm has engaged one Contractor named M/s Aurobindo Construction Corporation for operating all the three iron ore leases. The manganese mines is worked by firm themselves. The mining machineries as shown in the list submitted before the Govt. of India are deployed by the Contractor. All the workers and employees of the iron ore mines are engaged by the

contractor as seen from annual returns under MCDR, 1988 furnished by the firm. "

38. As per the report received from the Indian Bureau of Mines (IBM), the legal heirs of late Dr. Sarojini Pradhan are at present operating two iron ore mines while one iron ore-manganese ore ML is non-operative due to entire area falling in forest land and diversification of the area for mining activity being awaited. The fourth lease of this ML holder for limestone and dolomite minerals is also closed due to poor quality of mineral and lack of market demand. However, despite these two non-working mines, as per the report of the IBM, the legal heirs of late Dr. Sarojini Pradhan have been able to produce 80413 MT of iron ore during 1999-2000 and 59010 MT iron ore during the first 10 months of 2000-2001. The full year production figures for the year 2000-2001 have not been provided by the IBM. Based on the 10 months production figure, the full year production can be estimated as 70812 MT (59010x12÷10). The production figure for the year 2000-01 provided by the legal heirs of late Dr. Sarojini Pradhan is 71394 MT which is quite close to the estimate made and hence it can safely be deduced that the production of iron ore by the legal heirs of late Dr. Sarojini Pradhan during the year 2000-2001 was atleast 70,000 MT.

39. On the other hand, as per the report of IBM, M/s Kalinga Mining Corporation has three mining leases of iron ore, one mining lease for iron-manganese ore and one mining lease of manganese ore. Barring one mining lease for manganese, all the four mining leases are operating. However, as per the report of the IBM, KMC has been able to produce only 38710 MT of iron ore during 1999-2000 and 25390 MT of iron ore during 2000-2001. In case of manganese mines the production during the last two financial years was 40 MT in 1999-2000 and 15 MT in 2000-2001.

40. Thus, from the report of IBM, it is clear that the production of iron ore by the legal heirs of late Dr. Sarojini Pradhan during the last two financial years, viz., 1999-2000 and 2000-2001 was more than double the production of iron ore by KMC and hence as far as the current scale of mining operations by the two applicants is concerned, the legal heirs of late Dr. Sarojini Pradhan have a decisive edge over KMC.

41. One of these two applicants, M/s KMC has appointed a contractor M/s Aurobindo Construction Corporation, as has been clearly indicated by the State Govt. in their report dated 12.9.2001. As per this report, in case of KMC the manpower, machinery and equipment has been deployed by the contractor whereas legal heirs of late Dr. Sarojini Pradhan have deployed their own manpower (including qualified technical personnel), machinery and equipment. Hence the knowledge and experience in case of legal heirs of late Dr. Sarojini Pradhan is their own whereas in case of KMC they are partly banking upon the knowledge and experience of their contractor.

42. As the legal heirs of late Dr. Sarojini Pradhan have deployed their own equipment and machinery and the manpower including technical staff, their financial resources are on a much better footing as compared to KMC in whose

617/97

case the inputs in the form of machinery and equipment as also the manpower have been entrusted to a contractor.

43. From the above analysis, it is apparent that KMC has largely banked upon the financial inputs of their contractor and has not made significant financial investment as compared to the other applicant, legal heirs of late Dr. Sarojini Pradhan. It may also be pointed out that mining operations may suffer severely if the contractor at any stage suddenly decides to withdraw.

44. It may also be pointed out that legal heirs of late Dr. Sarojini Pradhan have also put up a quality crushing unit (Sayaji) of 60000 MT capacity on their Baitarani mines. Compared to this the crushers set up by KMC/their contractor are much smaller. The legal heirs of late Dr. Sarojini Pradhan have, therefore, an edge over the other applicant on this account also.

45. To conclude the legal heirs of late Dr. Sarojini Pradhan have a clear edge over KMC when assessed on the touchstone of the parameters laid down under Section 11(3) of the Act (quoted at para 32) because production of iron ore by them during the last two financial years on their own strength is more than double the production of iron ore by KMC, they have deployed their own machinery, equipment and a quality crushing unit and engaged workers and qualified technical personnel. Hence, keeping the provisions of second proviso to Section 11(2) and Section 11(3) of the Act in mind, the legal heirs of late Dr. Sarojini Pradhan deserve to be assigned priority over KMC.

46. In view of the facts discussed in the preceding paragraphs, the Central Govt. accepts the present recommendation of the State Govt. of Orissa and conveys its approval to the grant of mining lease for minerals iron ore and manganese ore in favour of the legal heirs of late Dr. Sarojini Pradhan over an area of 171.226 ha in village Kalaparbat range hill of Keonjhar district of Orissa for a period of 20 years under Section 5(1) of the Act.

47. Before allowing grant of mining lease the State Government may kindly ensure the compliance of the amended provisions of the Act and the Rules, and other applicable Acts & Rules including Forest (Conservation) Act, 1980 and Environmental Notification dated 27.1.1994 as issued and amended by Ministry of Environment & Forests.

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

Yours faithfully

(DR. R. K. KHATRI)
Deputy Secretary to the Government of India
Tel.No.3384334

Registered

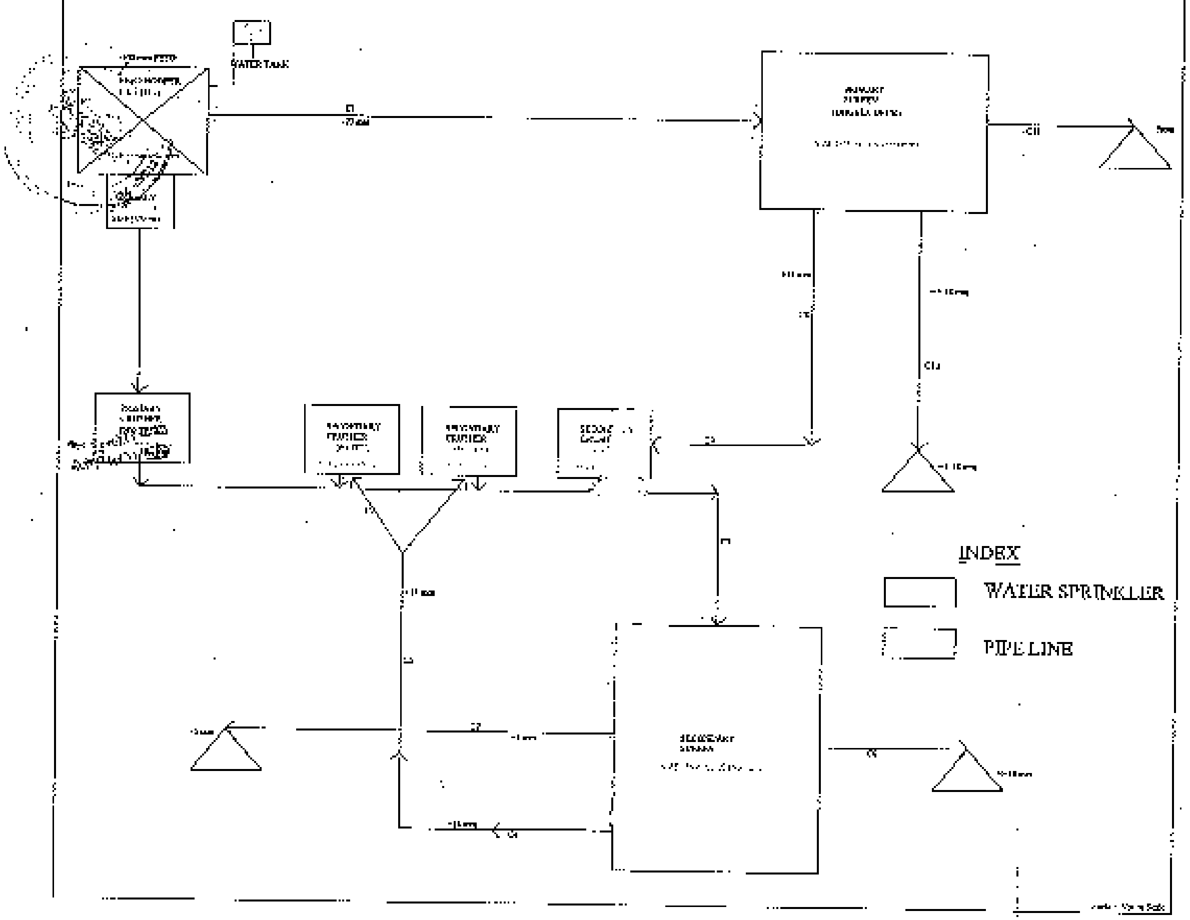
Copy to :

1. The Controller General, Indian Bureau of Mines, Indira Bhavan, Civi Lines, Nagpur-440 001.
2. The Chairman-cum-Managing Director, Mineral Exploration Corporation Ltd.; High Land Drive Road, Seminary Hills, Nagpur-440006.
3. PS to Minister of Steel & Mines.
4. Guard File.

(DR. R. K. KHATI
Deputy Secretary to the Government of In
Tel.No.33843

Annexure - (B).

FLOW DIAGRAM OF 200 TPH. CRUSHER PLANT AT KALAPARBAT IRON & Mn. MINES.



Amitav Sasmal
RQP/BBSR/113/94/A

ANNEXURE - X

CERTIFICATE OF RECOGNITION AS QUALIFIED PERSON TO PREPARE MINING PLANS

(Under Rule 22C of Mineral Concession Rules, 1960)

Shri Amitav Sahoo

of 222/13, Kansarijharan Road, Unit-VI, Bhubaneswar - 751 001

of Shri Brundaban Sahu having given satisfactory evidence of his qualifications and experience is hereby granted recognition under Rule 22C of the Mineral Concession Rules, 1960 as a Qualified Person to prepare Mining Plans.

His registration number is RQP/BBS/011/99/A

This recognition is valid for a period of two years ending 22nd February, 2001

नवीनीकृत दिनांक 22.02.2011
Renewed up to

Regional Controller of Mines
Indian Bureau of Mines

Place : Calcutta
Date : 23.02.1999

क्षेत्रीय खान नियंत्रक
Regional Controller of Mines
भारतीय खान ब्यूरो
Indian Bureau of Mines
कलकत्ता
Calcutta

PROGRESSIVE MINE CLOSURE PLAN

In Respect of

KALAPARBAT IRON & MANGANESE DEPOSIT OVER AN AREA OF 152.927 HECTS IN VILLAGE RAIKA AND THAKURANI R.F. UNDER CHAMPUA SUB-DIVISION OF KEONJHAR DISTRICT (ORISSA)

(Under Rule 23B of MCDR – 1988)

For and on behalf of

Dr. Sarojini Pradhan

Prepared by:

AMITAV SAHOO
CONSULTING GEOLOGIST
RQP/BBS/011/99/A

CONTENTS

Amitav Sahoo
RQP/BBS/011/99/A

1. INTRODUCTION.

1.1 Brief introduction of mine:

(a) **Name of the applicant** : **Dr. Sarojini Pradhan**
At/Po.:- Telenga Bazar
Dist. :- Cuttack
State :- Orissa.
Pin :- 753009
Phone :- 0671-225614(O),225613(R)

(b) **Location and extent of the lease area** :
Granted mining lease area over 152.927 hectares is located in Thakurai R.F., Village- Balita & Raika in Keonjhar district of Orissa and is the part area of Survey of India Toposheet bearing No. 73 F/8 on a scale of 1:50,000 bounded by the latitudes Latitude:22° 03'37" to 22° 04' 36" Nand longitudes Longitude :85° 25' 21" to 85° 26'19 " E.

c) **Leasehold status** : The Govt. has granted the said area vide letter No. VI-MG-177/87-5822 Dated 24.05.90. (Ref. Annexure:-III)

d) **Mining Plan** : The Mining Plan has approved vide letter No CAL/KJ/FE/MP- 254 Dated 25.02.93. (Ref. Annexure:-IV)

(e) **Type of lease area** : M.L. area over 152.927 hectares include forest, road and waste land.

The pre-mining land use pattern, however, is as follows :-

Land use	Type of Land	Area (in hectares)
Forest	Reserve Forest.	133.579
	Village Forest.	12.193
Non-forest land	Waste land	7.155
	Agricultural fields	Nil

Amitav Sahoo
RQP/BBS/011/99/A

(f) **Method of Mining** : Method of mining will be opencast and semi-mechanised.

(g) **Mineral Processing** : The blasted ROM of Iron ore will be crushed and screened and the finished lumpy (sized) ore will be dispatched to customers by truck and rail transport system, and Manganese ore will be marketed after manual sorting, sizing, breaking & blending.

1.2 Reasons for closure:

(a) **Predictable** : There will be no exhaust of any ore in planned period of five (5) years. Exploration has not been completed up to the base / barren rock. Therefore, progressive closing of the mine is not possible due to exhaust of ore in the quarries/ parts there of.

(b) **Unpredictable** : Closure may be possible due to natural calamities, mine related accident, local issues and statutory restrictions etc.

1.3 Statutory Obligations:

- Section 27(2) of the Mineral Concession Rules, 1960 states that land reclamation is necessary after completion of the mining operations.
- The PMCP has submitted under the Rule 23 (D) of MCDR ,1988
- As per the one of the terms and conditions laid down in the model form of the mining leasec adopted by the State Govt. the mined area shall be reclaimed to the satisfaction of the State Govt. before the pit is abandoned.
- Vide notification GSR 330(E) dated 10.04.2003. MCDR, 1988 has been amended incorporating mine closer plan along with mining plan.

Amitav Sahoo
RQP/BBS/011/99/A

1.4 Closure Plan Preparation:

Lessee, Dr. Sarojini Pradhan will execute the progressive mine closer plan (PMCP), which is prepared by recognized qualified person, Shri Amitav Sahoo. The details are as follows:

(a) Name and address of the Applicant:

Dr. Sarojini Pradhan
At/Po :- Telenga Bazar
Dist. :-Cuttack.
State :- Orissa
PIN :- 753009
Phone :- 0671-225614(O) 225613(R)

(b) Name & Address of the RQP preparing Progressive Mine Closure Plan:

Amitav Sahoo.
Regd. No.- RQP/BBS/011/99/A
C/o Prafula Nayak,
In front of Orissa petroleum
Main Road,
Barbil, Keonjhar.
ORISSA.
PIN. :– 758035.
Phone No. :- 9437263683

(c) Name of the Executing Agency:

Progressive Mine Closure Plan will be implemented by the Lessee, Dr. Sarojini Pradhan.

APPROVED

Amitav Sahoo
RQP/BBS/011/99/A

2. MINE DESCRIPTION.

2.1 Geology:

(a) Topography:

The lease area represents a rugged mountainous topography having highest altitude of 667m at the hill peak and 524 m as the lowest altitude towards the north-central and south-eastern part of the area closed to the lease boundaries.

(b) Geology:

Kalaparbata ML area is located just towards south-west of the well known Thakurani hill. The leasehold area is underlain by the different component litho-units of the Mixed Facies Formation viz. clayey and ferruginous shale, banded iron formation (Banded Hematite Jasper or BHJ), and altered tuff. In the north-central, north-western and southern part of the lease, red, orange and purple silty shale of the Bended Shale Formation are exposed, while thin zones of loose laterite (murum) are ubiquitous. Hard massive and finely laminated or thin bedded hematite (iron ore) bodies also constitute important litho-units of the area.

(c) Structural Set-up:

In tune with the regional structure, the litho-units in the lease area also exhibit multiple deformations, which is manifested in the apparently chaotic attitudes of bedding planes. The directions of bedding dips are southwesterly, westerly or northwesterly accordingly as the strikes are NW-SE, N-S or NE-SW. The general trend, however, is NNE-SSW with westerly dips of variable magnitude. The first and the main fold has NNE-SSW trending axis with rolling plunges either to NNE or SSW. This aspect, coupled with the superposed broad warps about ENE-WSW axes, has given rise to basins and domes of variable size reflected in the lenticular geometry of the iron ore bodies as well as the other litho-units.

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(d) Description of the Deposits:

(i) Iron Ore:

Iron ore occurs as Insitu bodies as well as important Float zones. The two Insitu bodies labeled as Insitu Ore Body –I & Insitu Ore Body –II and the float zones labeled as FOZ - I to FOZ – IV.

Insitu Ore Body (IOB) – I :

The Insitu ore body – I is most important from the point of view of quality and quantity, which is exposed for over 500 m strike length on top of the main NW-SE trending ridge with the best massive outcrops occurring right on the peak.

Insitu Ore Body (IOB) – II :

The Insitu ore body – II occurs on top of a small N-S trending ridge at the southeast corner of the lease. The surface of the IOB-II is mostly covered by laterite and conga with pebbles of hematite.

Float Ore Zone (FOZ) :

The hard massive ore as well as thin hematite bands within the Fe-shale give rise to extensive float ore zones. The size of the clasts in the float zone ranges from thin 5mm to as much 50 cm accordingly as the source is the laminated or the massive ore body. The general grade of the ore from the float zones is high with the tenor varying from 60 to 67 % Fe.

(ii) Manganese ore:

Manganese mineralisation occurs in a small area north and east of the manganese leasehold of Tulloch in the northwestern part of the area. Manganese ore occurs as small pockets, bands and thin beds in laterite, goethite and lateritised Fe-shale, respectively.

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2.2 Reserves:

(a) Reserves & Grade :

(i) Geological Reserve:

As per the approved mining plan the geological reserve estimated under proved, probable & possible categories are presented as below :

Type of Reserve	Float ore zone	Insitu Ore body-I	Insitu Ore body-II	Total Iron ore	Manganese ore
Proved	631896	1747872	171024	2550792	125060
Probable	166538	1837700	337536	2341774	123140
Total	798434	3585572	508560	4892566	248200

Mineable Reserve:

The total estimated geological reserve after allowing the losses of ore under benches left at the ultimate pit limit for safety purposes and stability of slope, in course of mining and handling of ore for Iron Ore.. Hence the mineable reserve worked out as:-

Type of Reserve	Float ore zone	Insitu Ore body-I	Insitu Ore body-II	Total Iron Ore	Manganese ore
Proved	600294	1618008	171024	2389326	101232
Probable	450220	1773264	332016	2255500	99720
Total	1050514	3391272	503040	4644826	200952

Summary of the Iron Ore Reserves with UNFC CODE

UNFC Code	Quantityin MT
222	23,89,326
332	22,55,500
333	2,47,740

Summary of the Manganese ore Reserves with UNFC CODE

UNFC Code	Quantityin MT
222	1,01,232
332	99,720
333	23,420

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2.3 Mining Method:

(a) Method of Mining:

Traditional open cast method will be followed in as much as the deposits are all shallow, more or less flat lying or with a slightly irregular bottom configuration of the ore body / zone and as such do not require underground working. The benches in the hard massive iron ore deposits shall have an average height of 6m and slope of 60^0 where in the relatively less hard manganese ore shall have an average height of 2 m and a slope of 30^0. The year wise development work and production schedules have accordingly been planned for the five-year period.

Winning of ore from the IOB-I will commence from the highest peak of the 661m ridge where the topography is very congenial for opening the deposit by developing benches on the slopes. Similarly in the IOB-II as well as manganese ore zone, the slopes will be taken advantage to open the deposit by suitable benches.

The working will be semi-mechanised involving the deployment of heavy earth moving equipment and by adopting deep hole drilling and blasting in the in situ ore deposits. The float iron deposits and manganese ore zone will be worked manually, in which the operations of winning and sizing of ore will be done manually.

(b) Production Level:

YEAR	FLOAT ORE	INSITU-ORE BODY-I	INSITU-ORE BODY-II	TOTAL Iron Ore	Mn - Ore
1ST YEAR	21555	99600	19776	140931	2587
2ND YEAR	44550	200640	23232	268422	3075
3RD YEAR	154500	302880	73152	530532	3475
4TH YEAR	367500	409440	83040	859980	3930
5TH YEAR	955830	1411488	220776	1999989	4998

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2.4 Mineral Processing:

The blasted ROM of Iron ore will be crushed & screened and the finished lumpy (sized) ore will be dispatched to customers by truck and rail transport system.

Crushing plant will produce 3 types of products namely BF lumps (-30 +18mm), Sponge grade lumps (-18 +5mm) and fines (-5mm).

3. REVIEW OF IMPLEMENTATION OF MINING PLAN / SCHEME OF MINING INCLUDING FIVE YEARS PROGRESSIVE CLOSURE PLAN UP TO THE FINAL CLOSURE OF THE MINE.

As it is a fresh area there is no specific period mentioned in the approved Mining Plan. The first year plan will start after obtaining the necessary clearances from the various Govt. Bodies. Preparation of mine Closure Plan (PMCP & FMCP) come in to force vides the notification GSR 330 (E) dated 10.04.2003. Therefore, this is the first PMCP, which is supposed to be reviewed while preparing PMCP as a component of next five years scheme of mining.

4. CLOSURE PLAN.

4.1 Mined out land:

At present, no scheme of reclamation can be submitted, as the area of interest is not yet fully explored scientifically, and from the mining operations of years, it cannot be concluded that any area is completely exhausted of ore deposit, where a systematic reclamation can be initiated. A systematic study will be taken-up during the coming years, to outline the ore body as well as a complete composite modeling of the ore body along with demarcation of areas having no mineral potential, which can be used for future dumping of waste materials. Once the proposed prove mentioned, is over, the reclamation programme will be finalized and will be duly incorporated in the follow-up mining scheme.

Hence, there will be no exhaust of Iron and Manganese ore within the planned period of five (5) Years. The mining area can be exhausted from 36th year onwards if planned production is achieved, demand continues. So, no reclamation is possible in the plan period of five years. However some plantation programme has been considered in the dump area and also some avenue plantation programme will be undertaken in the composite. The schedule of plantation is given below.

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Year	Location	Plantation area (in ha)	No.Of Sapling
1st	7.5 m along M.L. boundary	0.45	700
2nd	Do	0.45	700
3rd	7.5 m. along diverted area	0.45	700
4th	-Do-	0.45	700
5th	-do-	0.45	700
Total	-Do-	2.25	700

Year	Pit No	Mined out area at the beginning (Ha)	Additional area proposed during the year (Ha)	Total area (Ha)	Area reclaimed and rehabilitated during the year (Ha)	Degraded area at the end of the year (Ha)
1st	Pit-I	Nil	1.36	1.36	-	1.36
	Pit-II	Nil	3.062	3.062	-	3.062
	Manganese Pit	Nil	1.826	1.826	-	1.826
2nd	Pit-I	1.36	1.79	3.15	-	3.15
	Pit-II	3.062	0.593	3.655	-	3.655
	Manganese Pit	1.826	0.250	2.076	-	2.076
3rd	Pit-I	3.15	1.75	4.9	-	4.9
	Pit-II	3.655	0.202	3.857	-	3.857
	Manganese Pit	2.076	0.228	2.304	-	2.304
4th	Pit-I	4.9	2.230.	7.13	-	7.13
	Pit-II	3.857	0.748	4.605	-	4.605
	Manganese Pit	2.304	0.257	2.561	-	2.561
5th	Pit-I	7.13	2.720	9.850	-	9.850
	Pit-II	4.605	0.680	5.285	-	5.285
	Manganese Pit	2.561	1.254	3.815	-	3.815
						18.950

Total mined out area within the present plan period =18.950 Hectares.
The reclamation and rehabilitation program will be done after completion of the proposed exploration schedule given in the mining plan .

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The total degraded land in proposed five years period and entire degraded land in conceptual stage is as under:-

Sl. No	Type of Land use	Area of Land Use (in ha.)	
		As at the end of the planned period of 5 years.	As at the end of conceptual period (life of mine).
1.	Area to be excavated.	18.950	37.38
2.	Over Burden Dump.	4.856	6.650
3.	Mineral Storage.	0.455	0.455
4.	Infrastructure (Workshop, Office, Crusher, Magazine, Rest Shelter, Roads. etc.).	0.732	0.732
	Total	**24.993**	**45.217**

4.2 Water quality Management:

(a) Existing Surface Water Bodies:

Granted M.L. area is observed to have been traverse by two seasonal nalas, which are indistinct. However, Baitarani River, the principal drainage system of the area, is flowing at a distance of 14 km north-east of the lease area.

(b) Existing Ground Water Bodies:

(i) Source of Water:

Tube wells and dug wells are the sources of fresh water for villages Balita and Raika. This water is mostly used for drinking purpose and domestic use.

(ii) Consumption of Water:

In a day, about 3000 liters of water consumed by the workers taking into account 15 liters of water per head per day. In addition 3000 liters will be sprinkled on haulage road, dump, mine faces to suppers the generation of dust and plantation mostly in dry season. Therefore, peak demand is expected to be 3000+ 3000 = 6000 liters.

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(c) Water Quality Management:

Working benches will be kept free from loose overburden/ waste materials. Check dam will be constructed around the dump to prevent washing off of loose sediments. The check dams which may constructed during the plan period is as under:-

Year	Location	Particular and size (L x B x H)			
		Check Dam to be constructed	L	B	H
1st		3	25	2	2
2nd					
3rd		-			
4th		-			
5th		-			
TOTAL		3			

Surface water samples from seasonal nalas in rainy season and ground water samples from the tube wells in villages Balita and Raika, will be collected & analysed for their pollutant levels, which will help to decide the type of treatment needed. There is no possibility of acid mine drainage.

4.3 Air Quality Management:

(a) Existing Air Quality Status:

There is no industry within 5 km radius of the M.L. area. This mine mainly emits the dust particles during the movement of trucks. However, air pollution is felt to be below the permissible limits.

(b) Corrective Measures:

(i) Monitoring:

Due to continuation of mining operation, pollution level will be increased. Therefore, air & noise level monitored / measured periodically. Noxious gases such as SOx, NOx and CO will be quantified. Dust fall, SPM and RPM will be measured.

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(ii) Management:

An area of 10,000 sqm. has been proposed to be planted with 10,000 saplings. Water sprinkling will be done over the dust prone areas such as haul road, working faces, loading & unloading points etc.

4.4 Waste Management:

Waste material likely to be generated is laterite, leteritic soil, shale and banded hematite jasper, which occur as intermediate waste in iron ore zone. Likely generation of waste/O.B during the plan period is 8,44,624 m^3. These waste materials will be dumped separately. Toxic elements from the said waste materials are not expected.

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

The reclamation and rehabilitation measure for dump area is given below:-

Year	Dump No.	Nature of the dump i.e., reject etc	Area at the beginning of the year	Additional area during the year	Area Rehabilitated during the year	Balance area at the end of the year
1st	Dump-I Dump-II	OB OB	Nil Nil	0.830 0.430	Nil Nil	0.600 0.200
2nd	Dump-I Dump-II	OB OB	0.250 0.200	0.150 0.106	Nil Nil	0.400 0.306
3rd	Dump-I Dump-II	OB OB	0.400 0.306	0.300 0.300	0.200 0.100	0.900 0.706
4th	Dump-I Dump-II	OB OB	0.900 0.706	0.300 0.250	0.200 0.100	1.400 1.056
5th	Dump-I Dump-II	OB OB	1.400 1.056	0.875 1.125	0.100 0.200	2.475 2.381
TOTAL						**4.856 Ha**

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Total waste likely to be generated during the conceptual year will be about 866500 cum. out of which about 1,36,964 m^3 will be dumped during the plan period covering an area of 1.70 ha. and up to 10 m. height.

The ultimate dump slope should me maintained at 20^0 to 22^0 with individual terraces slopes not exceeding 37^0 . The individual terrace height may be limited to about 10m Each terrace should have inward slope with each drain s at the inward side of the terrace . The each drains of the individual terrace should be connected to the garland drain out side the periphery of the dump. These each drain should preferably have half concrete open pipe followed by settling tank to avoid wash off.

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

Plantation Schedule in Dumps;-

Year	Plantation Area	No. of Sapling
3rd	0.40	640
4th	0.50	800
5th	0.50	800

Construction of Retaining wall

Year	Location	Particular and size (L x B x H) m			
		Retaining wall to be constructed	L	B	H
I st	OB Dump	2	568	2	2
2nd					
3rd		-	-	-	-
4th	-	-	-	-	-
5th		-	-	-	-
TOTAL		2	568		

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YEAR WISE PROTECTIVE MEASURE FOR THE DUMP.

Year.	Retaining wall.	Garland drain.	Settling tank.
1st	2	3	2
2nd			
3rd	-	-	-
4th	--	--	--
5th	--	--	--
TOTAL	2	3	2

The following measures will be undertaken to stabilize the dump and for the arrest of wash-offs :

1. Segregation of materials
2. Water sprinkling. of regular compaction.
3. Terracing at the dead end.
4. Construction of check dam.
5. Development of garland drain.
6. Settling tank.

4.5 Topsoil Management:

During the first five years of working, very small quantity of topsoil will be encountered in the area, as no topsoil has been observed in this area previously. If it is observed, then it will be stored close to the workings on sites with shale as the underlying litho logy. And this soil will be reused for plantation, growing grass and shrub for dump stabilization.

4.6 Tailing dam Management:

There will be no beneficiation / washing plant in the lease area. Therefore, the question regarding the existence and management of tailing dam dose not arise.

4.7 Infrastructure:

(a) Existing:

(i) Road:

Lease area is connected by all weather unmetalled road and connected to N.H.215 , at a distance of 3 km. joining Keonjhar and Rajamunda. The mining area is situated at a distance of 7 km from Joda and 12 km from Barbil.

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(ii) Railway:

The nearest railway station is Barbil located at a distance of 12 km from the granted M.L. area. The rail distance between siding and Tatanagar is 150 km only.

(iii) Health:

Medical facilities are available at Joda.

(iv) Education:

Education up to M.E school level is at Balita. High School Level and College Level education are available At Joda, located at a distance of 7 km.

(v) Market:

Full fledge market facilities are available at Joda and Barbil, which is at a distance of about 7 km and 12 km respectively.

(vi) Post & Telephone:

Postal And Telephone facilities are available at Joda.

(b) Proposed:

Keeping in view the increased rate of production of mainly iron ore from 0.104 million tones to 0.211million tones per annum and Manganese ore from 1675M.T. to 4000M.T. respectively, so the following buildings are required to be established in the M.L area for smooth running of the day to day mine operation:

1. Mine administrative Office
2. First aid Center.
3. Rest Shed.
4. Blasting Shelter.
5. Explosive Magazine
6. Staff Quarters.

4.8 Disposal of Mining Machinery:

(a) Decommissioning:

There is no possibility of decommissioning of mining machinery during the planned period of five (5) years.

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(b) Disposal:

Life of the mine is 26 years, which is more than the life of the machines. Therefore, the machines mentioned above will be utilized / sold depending upon their running condition during the course of mining.

4.9 Safety & Security:

(a) During Mining:

During mining, the following measures has been proposed for safety and security:

- Mine working area will be fenced off to prevent falling down of man and animals.
- A guard will be employed to prevent pilferage or theft and to keep the explosive in safe & secure.
- Blasting danger zone will be identified and indicated to the concerned mine people and nearby locality to avoid inadvertent trespassing.
- Whistle or Siren will be blown at the time of blasting to aware the man & animals for not entering in to the blasting danger zone.

(b) During Abandonment:

During the planned of 5 years, there will be no exhaust of ore (s) the quarries or part (s) thereof. Therefore, the question regarding mine abandonment does not arise.

4.10 Disaster Management and Risk Assessment:

- As far as the nature of deposit and method of mining is concerned, there is no possibility of Landslides, Subsidence, Inundation, Fire and Tailing dam failure due to fault in mining activities.
- Though earthquake is felt several times in Orissa, damage to man & material has not been severe.

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- Keeping in view the past occasions, flood is not expected, as the mine area is located at a higher level. Baitarani River controls the drainage system and receives the entire rain & run-off water.

- Small-scale fire may happen which can be extinguished by fire extinguisher.

- Area under reference will have no proposal of beneficiation / washing plant. Therefore, tailing dam is not necessarily required and the question regarding the tailing dam failure does not arise.

4.11 Care and Maintenance during Temporary Discontinuance:

During the course of mining there may be temporary discontinuance due to unforeseen causes such as:

- Court order.
- Natural Calamities.
- Accident (Mine related).
- Slope failure.
- Failure in fulfillment of statutory requirement.
- Local issue or
- Any other unforeseen circumstances.

Therefore, an emergence plan is necessary to re-open the mine, which will include:

- Intimation to local mine and legal administrative authorities concerned (IBM, DGMS, Directorate of Mines, Circle Mining Office etc.) regarding the temporary discontinuance.

- Explanation to the local community regarding the cause of temporary discontinuance and possibility of reopening of mine in future.

- Listing and proper storing of the Machines, Materials, Assets and Documents.

- Care and maintenance of machinery as per the machine operating manuals.

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- Tightening of the security to keep the machine and materials safe & secured.

- Monitoring of status of unplanned discontinued mining operation in respect of bench height, width, individual bench slope angle, over hang, under cut, misfire or any other parameters whose levels either in form of higher side or lower side is dangerous for further mine working.

- Repair & maintenance of haul road.

- Regular monitoring of air, water, noise etc. in the permitted area.

Preparation of plans & sections at the time of discontinuance.

- Projection of benches in plans and sections which is safe for future working.

- Management of misfire. Fly rock movement, maintenance of machinery etc., which is risk free and not dangerous for further working.

- Intimation to the concerned authorities for reopening, ones the mine is risk free.

5. ECONOMIC REPERCUSSIONS OF CLOSURE OF MINE AND MANPOWER RETRENCHMENTS.

There will be neither final/permanent closure of mine nor the reduction of manpower in a phased manner. Therefore, these aspects are not relevant to describe at present.

5.1 Number of Local residents employed in the mine, status of the continuation of family occupation and scope of joining the occupation back:

Not Applicable.

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

Not Applicable.

5.3 Satellite occupations connected to the mining industry number of persons engaged therein, continuance of such business after mine closes:

Not Applicable.

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5.4 Continued engagement of employees in the rehabilitation status of mining lease area and any other remnant activities:

Not Applicable.

5.5 Envisaged Repercussions on the Expectation of the Society around due to closure of mine:

Not Applicable.

6. TIME SCHEDULING FOR ABANDONMENT.

Life of the mine for the lease under reference is more then 26 years.

Scientific mining may result abandonment of mine or part thereof from 6th year of mine opening and onwards depending upon the certain factors such as exploration outcome, the demand etc.

It is not envisaged under the scope of present Progressive Mine Closure Plan as may be required before the final closure of mine. However a time schedule for abandonment of the mine is given below considering the present life of the mine.

The year wise proposal like Check dam settling tank , retaining wall garland drain are as follows.

Items	Details	Year	Area (ha)	Quantity	Expenditure (Rs)	Remarks
			Proposed	Proposed	Proposed	
A.)Reclamation and Rehabilitation of mined out area	i) Back filling	1st to5th	Nil	Nil	Nil	
	ii)Aforestation on the back filled area	1st to 5th	Nil	Nil	Nil	
	iii)Others (please specify)eg. afforastation on exhausted benches	1st to 5th	Nil	Nil	Nil	
	iv)Pisciculture	1st to 5th	Nil	Nil	Nil	
	v)Converting into water reservoir	1st to 5th	Nil	Nil	Nil	

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	vi) Picnic Spot	1st to 5th	Nil	Nil	Nil	
(B) Stabilization and rehabilitation of Dump	i)Terracing	1st to 5th	Nil	Nil	Nil	
	ii)Pitching	1st to 5th	Nil	Nil	Nil	
	iii)Construction of Parapet wall Retaining wall at toe of dump	2nd 1		2 no 568	1,13,600	Toe of dump
	iv)Construction of Check dam along slope of valities	2nd		3	22,500	
	(v)Construction of Settling Ponds, channels	2nd		2	25000	
	(vi)De silting of settling ponds .channels	3rd to 5th			10,000	
	vii) Afforastation on dumps					
	viii) Other specify					
(C) Rehabilitation of barren Area within Lease	I) Affrication (Green belt building)		Nil	Nil	Nil	
(D) Environmental Monitoring (Core zone and Buffer zone separately)	i) Ambient air quality					
	ii) Water quality	1st to 5th			50,000	
	iii) Noise Level survey					
	iv)Ground vibration					
	v) Other (please specify)					

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7 ABANDONMENT COST.

There is no possibility of abandonment of quarries or parts thereof during ensuing three years. However, tentative cost of each of important activity of abandonment e.g. decommissioning, reclamation & rehabilitation etc have been indicated to have the idea about the funds that may be required for the final closure.

Sl. No.	Particulars	Time/Year (after abandonment)
01	Decommissioning / Demolition.	1 Yr.
02	Removal of Infrastructure.	1 Yr.
03	Removal of equipment and heavy machineries	1 Yr.
04	Site Safety.	2 Yrs.
05	Reclamation and rehabilitation of workings	2 Yrs
06	Maintenance / monitoring during and after closure operation.	2. Yrs.
07	Retrenchment and relocation manpower	1 Year

(1) Decommissioning / Demolition:

Demolition of Administrative building, Workshop,, Crusher building, Canteen & removing the debris.

Total Estimated Cost (in Rs.) :- 1,00,000.

(2) Removal of Infrastructure:

Transportation Infrastructure:- The road passing through the lease are used by villagers. These shall continue to be used even after closure. The lease area do not having any rail, ropeways or belt conveyors.

Electrical Infrastructure:- Electrical transmission lines belong to Govt. may be shared by other lessees. Expenditure for dismantling of balance extension has been considered.

Total Estimated Cost (in Rs.) :- 25,000.

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ANNEXURE – II

Dr. SAROJINI PRADHAN

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Ref No. .....

Date:- 15/11/07

UNDERTAKING

This is to undertake that all the measures proposed in this **Progressive Mine Closure Plan** by the RQP, **AMITAV SAHOO,** Barbil, Keonjhar, ORISSA, under Rule 23B of MCDR, 1988 in respect of "Kalaparbat Iron and Manganese leasehold over an area of 152.927 Hects. in the District of Keonjhar, state of Orissa will be implemented in a time bound manner.

Sing. Of Applicant in full.
For Dr. SAROJINI PRADHAN

(SATYAJIT PRADHAN)
Partner